

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 4 Oct 2019 09:07:04 -0600  
**To:** Schountz, Tony  
**Subject:** FW: R01 Letter  
**Attachments:** Munster LOS.pdf

Here it is,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** "Thruston, Jeffrey (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Friday, October 4, 2019 at 6:55 AM  
**To:** '(b) (6)' <(b) (6)>  
**Subject:** R01 Letter

Hi Dr. Munster,

Attached is your executed R01 Letter.

Sincerely,

Jeff Thruston

Jeffrey T. Thruston, J.D., M.S.  
Technology Transfer and Patent Specialist  
Immunology & Emerging Infections Branch  
TTIPO/NIAID/NIH  
5601 Fishers Lane, Suite 2G46, MSC 9804  
Rockville, MD 20892-9804

(b) (6)

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National Institute of  
Allergy and  
Infectious Diseases

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ROCKY MOUNTAIN LABORATORIES

Division of Intramural Research  
National Institute of Allergy  
and Infectious Diseases  
Laboratory of Virology  
Virus Ecology Unit

October 1, 2019

Subject: Support for R01 on mechanisms of henipavirus entry and pathogenesis

Dear Dr. Schountz,

I am very pleased to support the project: mechanisms of henipavirus entry and pathogenesis

My group has extensive experience and a wide variety of tools available to support the study of the mechanisms of henipavirus entry and pathogenesis. My group at the Rocky Mountain Laboratories (RML), Division of Intramural Research (DIR), NIAID, NIH, will perform critical *in vitro* and *in vivo* experiments in BSL4, to complement data produced in your laboratory. We will perform virus rescue of recombinant strains, perform infection of bat cells, and animal infections to evaluate pathogenesis.

We, Drs. Julia Port, Claude Kwe, and Vincent Munster will contribute approximately (b) (4) of our effort to this project, subject to availability of time and resources. Please note that this collaboration is part of our official duties as a federal employee at NIAID, NIH, and no funds from the grant will be used in intramural research, neither will we accept any form of remuneration, whether in the form of salary, honoraria, or travel expenses. We will provide scientific input (and mentoring) but will not have any duties associated with programmatic stewardship, which will be performed by the collaborators through a NIAID extramural program officer.

Further, in keeping with the mission of NIAID to promote and facilitate biomedical research and the dissemination of new knowledge, we would supply requested research materials and technical expertise not only to you, but also to other interested and qualified parties for research purposes. Approval for this collaboration has been granted by the DIR Director, Dr. Steven M. Holland

Sincerely,

(b) (6)

Vincent Munster, PhD  
Chief, Virus Ecology Section, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



(b) (6)

Steven M. Holland, MD  
Director, Division of Intramural Research  
National Institute of Allergy and Infectious Diseases  
National Institutes of Health



**From:** Plowright, Raina  
**Sent:** Wed, 2 Oct 2019 19:09:38 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Cc:** Hector Aguilar-Carreno; Ausraful Islam; Emily Gurley; Jamie Lloyd-Smith; Olivier Restif; Alison Peel; Cara Brook; Kwe Claude, Yinda (NIH/NIAID) [F]; Schulz, Jonathan (NIH/NIAID) [F]; Bushmaker, Trenton (NIH/NIAID) [E]; David William Buchholz  
**Subject:** Re: Prelim data Bangladesh

Exciting update! Thanks Vincent.

On Oct 2, 2019, at 1:06 PM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

Very cool! Great job!

Let me know if you'd like us to do some live virus work to corroborate your data!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Hector Aguilar-Carreno <[REDACTED] (b) (6)>  
**Date:** Wednesday, October 2, 2019 at 1:03 PM  
**To:** "[REDACTED] (b) (6) <[REDACTED] (b) (6)> Ausraful Islam <islam.[REDACTED] (b) (6)> Emily Gurley <[REDACTED] (b) (6)> "Plowright, Raina" <[REDACTED] (b) (6)> Jamie Lloyd-Smith <[REDACTED] (b) (6)> Olivier Restif <[REDACTED] (b) (6)> Alison Peel <[REDACTED] (b) (6)> Cara Brook <[REDACTED] (b) (6)>  
**Cc:** "Kwe Claude, Yinda (NIH/NIAID) [F]" <[REDACTED] (b) (6)> Jonathan Schulz <[REDACTED] (b) (6)> Trenton Bushmaker <[REDACTED] (b) (6)> David William Buchholz <[REDACTED] (b) (6)>  
**Subject:** Re: Prelim data Bangladesh

Sounds great, Vince!... and thank you for the update!

To continue with the trend of great results, and as a quick update, I am happy to report that we have confirmation in my lab that we have been able to make PK13 cell sub-clones expressing various levels of ephrinB2 and ephrinB3 on their cell surface (by flow cytometric analysis). Also, generally, the levels of cell-cell fusion directly correlated with the levels of ephrinB2/B3, as opposed to a fairly recent publication where they saw an inverse correlation of cell-cell fusion and ephrinB2 levels. The authors from the prior publication over-expressed the receptors, which was the problem with that paper in my opinion. We have now data for more relevant physiological concentrations of cell receptors. Our next step is to measure viral entry levels

using our pseudotyped viral assays. I feel that we are finally making fast progress now, and we will be able to put in any pairs of Henipaviral or Paramyxoviral glycoproteins in our systems. Experiments need to be repeated, etc... but we will be happy to present our data in our Montana meeting if people are interested to hear about it. These data may help the modelers. We also have good data on the effects of F/G glycoprotein ratios on cell-cell fusion. We may be able to assess viral entry for these ratios as well, to feed the modelers.

More to come...!

Hector

Hector Aguilar-Carreno  
Associate Professor  
Microbiology and Immunology  
College of Veterinary Medicine  
Cornell University  
Office: (b) (6)

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Wednesday, October 2, 2019 2:08 PM  
**To:** Ausraful Islam (b) (6); Emily Gurley <(b) (6)> Plowright, Raina <(b) (6)> Jamie Lloyd-Smith <(b) (6)> Hector Aguilar-Carreno <(b) (6)> Olivier Restif <(b) (6)> Alison Peel <(b) (6)> Cara Brook <(b) (6)>  
**Cc:** Kwe Claude, Yinda (NIH/NIAID) [F] <(b) (6)> Schulz, Jonathan (NIH/NIAID) [F] <(b) (6)> Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)>  
**Subject:** Prelim data Bangladesh

Hi everyone,

Here is some of the prelim data generated by Kwe and team from the Bangladesh samples (~500 samples screened with the Tong et al assay). So far no henipaviruses, but two sequences (in red) which cluster with an unclassified bat paramyxo lineage which includes bats from Australia and Kenya. We are working to see whether we can get the F and G sequences from these two positives to feed into the genotype-phenotype analyses (even though they are not henipa's). We have around 2-3 plates (96 samples per plate) for analyses, so we should be done with this soon.

We will be running Jordan and Congolese samples soon as well to maximize output (and to alleviate that the Australian samples are under a stringent MTA which prevents us from looking for unidentified paramyxo viruses)

In addition, we are batch sequencing F and G sequences of the Hendra viruses detected in the Australian samples, and will continue with trying to full genome sequencing using the VirCap-seq method. As soon as we have a batch of F and Gs of Hendra, we'll send the sequences to Hector for further phenotypic analyses.

<image001.png>

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



**From:** Plowright, Raina  
**Sent:** Wed, 2 Oct 2019 19:08:30 +0000  
**To:** Olivier Restif  
**Cc:** Broder, Chris (USU-DoD); Andrew Cunningham; Louise Gibson; Eric Laing; Munster, Vincent (NIH/NIAID) [E]  
**Subject:** Re: serology screening

Hi Chris,

It is good to hear that it would be useful to have a comprehensive plan for serology and to understand some of the limitations regarding reagents. We have focused on virological surveillance but must develop alternative strategies for some regions where we are getting very low prevalence.

This is a topic of discussion at our PI meeting in 2 weeks and we will be in touch to discuss a collaboration after this.

Unfortunately, I've not been able to make any of the BOHRN meetings as yet but I hope to see you at one in the near future.

Best,  
Raina

On Oct 2, 2019, at 11:03 AM, Olivier Restif <[REDACTED] (b) (6)> wrote:

Dear Chris,

Thank you for explaining the situation. We really appreciate the importance of your work and trust we can come up with a practical collaborative agreement. I've mentioned the issue to Raina, Vincent and our other collaborators on the DARPA-funded PREEMPT grant. We have our annual meeting in two weeks when we will discuss this in more detail so we can come up with a mutually agreeable plan.

Best wishes,

Olivier

On 2 Oct 2019, at 17:45, Broder, Christopher <[REDACTED] (b) (6)> wrote:

Dear Andrew / Olivier

We need clarification on the project and Raina should weigh in as well. She is part of the BOHRN team and should be aware of what we are doing and the luminex platform.

We have several of our own collaborations ongoing and to start. Majority funded by DTRA, and much of it now in SEA (Malaysia/Thailand/Cambodia/Singapore/India; but we also have work ongoing with Vincent and RML.



Eric is also leading other activities in West Africa that are being initiated with DoD folks.

Any materials we contribute will be on a collaborative and scientific basis. So the scope / details and goals of what your group and Raina are doing we should be briefed on and letters of collaboration need to be sent.

Just because there may be mechanisms to buy proteins and beads does not mean my lab is company.

Indeed, the other standards and reagents that go along with the platform are non-renewable and took

many years to generate/validate, and great deal of time and effort put into the refinement of the assay

and the interpretation of the data that is generated.

I know we have had a long-standing collaboration on the serological approach in virus surveillance and

we want to continue but we can't afford to compete with ourselves either if you understand.

v/r

Chris

--

**Christopher C. Broder, Ph.D.**

Professor and Chair

Department of Microbiology and Immunology

Uniformed Services University, B4152

4301 Jones Bridge Rd, Bethesda, MD 20814-4799

**USU is "America's Medical School"**

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Lucille Washington

Administrative Officer

email - (b) (6)

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fax - 301-295-3773

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**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Wed, 2 Oct 2019 11:34:54 -0600  
**To:** Schountz, Tony  
**Subject:** FW: DSAT

20180514-2052

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Hoe, Nancy (NIH/OD/ORS) [E]" <(b) (6)>  
**Date:** Wednesday, October 2, 2019 at 11:23 AM  
**To:** "(b) (6)" <(b) (6)> "Anderson, Rebecca (NIH/OD/ORS) [E]" <(b) (6)>  
**Subject:** RE: DSAT

20180514-2052

Nancy P. Hoe, Ph.D., CBSP  
Biosafety Officer/Responsible Official for Rocky Mountain Laboratories  
Division of Occupational Health and Safety  
Office of Research Services, Office of the Director, National Institutes of Health  
903 South 4th St  
Hamilton, MT 59840  
Tel: (b) (6)  
Fax: 406-375-9705

\*\*\*\*\*

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**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Wednesday, October 2, 2019 10:59 AM  
**To:** Hoe, Nancy (NIH/OD/ORS) [E] <(b) (6)> Anderson, Rebecca (NIH/OD/ORS) [E] <(b) (6)>  
**Subject:** DSAT

Hi Nancy and Becky,

Do you know whether RML has a specific DSAT registration number? Working on a RO1 proposal and they are requesting some sort of a registration number,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Wed, 2 Oct 2019 10:46:42 -0600  
**To:** Schountz, Tony  
**Subject:** Re: Select Agent

No idea

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Wednesday, October 2, 2019 at 10:46 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Select Agent

Vinnie, do you know what the term "registration status" below in item 2 means? Is this a registration number that has been assigned to RML by DSAT or other entity?

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Wednesday, October 2, 2019 at 10:37 AM  
**To:** "Schountz, Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Select Agent

Maybe include smtg like this:

The Rocky Mountain Laboratories is a federal research institute within the National Institutes of Health. The Laboratory of Virology, which has CDC DSAT/USDA AgSAS approval to handle all currently listed viral select agents (including, Nipah and Hendra virus) and all infectious work will be carried under necessary high or maximum containment in a BSL-3/BSL-4 laboratory.

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Wednesday, October 2, 2019 at 10:16 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Select Agent

Vinnie,

I need a Select Agent section in the proposal. The guidelines are below. Do you/ RML have info on items 2 and 3???

Thanks,

Tony

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

**All applicants proposing to use select agents:** Address the following three points for each site at which select agent research will take place. Although no specific page limitation applies to this section, be succinct.

1. Identify the Select Agent(s) to be used in the proposed research.
  2. Provide the registration status of all entities\* where Select Agent(s) will be used.
- o If the Project/Performance Site(s) is a foreign institution, provide the name(s) of the country or countries where Select Agent research will be performed.

o \*An“entity”isdefinedin42CFR73.1as“anygovernmentagency(Federal,State,or local), academic institution, corporation, company, partnership, society, association, firm, sole proprietorship, or other legal entity.”

3. Provide a description of all facilities where the Select Agent(s) will be used.

o Describe the procedures that will be used to monitor possession, use and transfer of the Select Agent(s).

o Describe plans for appropriate biosafety, biocontainment, and security of the Select Agent(s).

o Describe the biocontainment resources available at all performance sites.



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 1 Oct 2019 14:38:14 -0600  
**To:** Alison Peel  
**Cc:** Plowright, Raina; (b) (6)  
**Subject:** Re: (b) (4)

Sounds good, dealing with (b) (4) is a bit tricky though.

Given that these would be at least very interesting ones (and a limited set), I think if you send those to MT (b) (4)

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Alison Peel <(b) (6)>  
**Date:** Tuesday, October 1, 2019 at 2:11 PM  
**To:** '(b) (6) <(b) (6)>  
**Cc:** "Plowright, Raina" <(b) (6) '(b) (6)  
<(b) (6)>  
**Subject:** Re: (b) (4)

Thanks Vincent. Understood. (b) (4)  
(b) (4)  
(b) (4) I will support Adrienne in trying to navigate  
this within Griffith  
Thanks  
Ali

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Tuesday, October 1, 2019 10:13 pm  
**To:** Alison Peel  
**Cc:** Plowright, Raina  
**Subject:** Re: (b) (4)

Hi Alison,

Your correct (b) (4), but on a more logistic note I'm not sure we can handle that amount of samples from our end. Even though they will be used for other analyses, (b) (4).  
(b) (4). Currently, the lab is not capable of handling that on top of the work we are already doing (b) (4) we are helping to get to Maureen and Devin).

Currently the focus is to try [REDACTED] (b) (4)  
[REDACTED] Unfortunately, the lab is quite stretched his so we need to discuss what to do with these samples and how we can facilitate analyses (what are the needed analyses exactly?).

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Alison Peel <[REDACTED] (b) (6)>  
**Date:** Sunday, September 29, 2019 at 10:46 PM  
**To:** '[REDACTED] (b) (6) <[REDACTED] (b) (6)>  
**Cc:** "Plowright, Raina" <[REDACTED] (b) (6)> Trenton Bushmaker  
<[REDACTED] (b) (6)> "Kwe Claude, Yinda (NIH/NIAID) [F]"  
<[REDACTED] (b) (6)>  
**Subject:** Re: [REDACTED] (b) (4)

Hi Vincent,  
Another thing to discuss at (or before!) the October meetings is your experience with shipping samples [REDACTED] (b) (4)  
[REDACTED]  
[REDACTED] Does that hold true for shipment as well? I wonder if we should be shipping [REDACTED] (b) (4)  
[REDACTED].

Cheers  
Ali

On Sun, 22 Sep 2019 at 01:25, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:  
Sounds good, typically universities will have long-term storage capacity so that might be an option,

Hopefully we can continue this project in the future, then I think you should write in a designated freezer for long-term storage where only very few people would have access too. This could be placed in a specific room etc. In addition, make sure that you have a specific inventory accounting for each sample (most problems start when there is no up-to-date inventory and people "loose" samples), we use

But alternatively, given that you can't handle the specimen without proper containment, storing the samples at an appropriate facility might not be a bad idea. Here at RML, [REDACTED] (b) (4), (b) (6)  
[REDACTED]

We can talk more about this in Bozeman / RML,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Alison Peel <(b) (6)>  
**Date:** Friday, September 20, 2019 at 4:48 PM  
**To:** "(b) (6) <(b) (6)>  
**Cc:** "Plowright, Raina" <(b) (6)> Trenton Bushmaker  
<(b) (6)> "Kwe Claude, Yinda (NIH/NIAID) [F]"  
<(b) (6)> "(b) (6) <(b) (6)>  
**Subject:** Re: (b) (6), (b) (4)

Hi Vincent,

Thanks very much for following up on this. I asked Manuel to (b) (4)  
when we receive results.

Our University Biosafety committee have been happy with (b) (4)  
have requested that I inform them of ongoing plans for the samples. This would need to include how long they would need to be retained for beyond the life of the current project.

This is not something I have experience in planning. Ideally, we'd like to retain them within our possession until we have a clear plan rather than just pass them onto another Australian facility. I'd be happy to hear any thoughts anyone has on this. Perhaps it will be clearer once I start testing samples for a wider range of viruses.

Cheers

Ali

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** 21 September 2019 01:58  
**To:** Alison Peel <(b) (6)>  
**Cc:** Plowright, Raina <(b) (6)> Bushmaker, Trenton (NIH/NIAID) [E]  
<(b) (6)> Kwe Claude, Yinda (NIH/NIAID) [F] <(b) (6)>  
**Subject:** (b) (4)

Hi Ali,

The Hendra virus screening is going well with a lot of positives. I would only like to remind you that if you still have original samples (e.g duplicates, urine samples etc.) you need to make sure that they are properly and securely stored (which I assume you guys do). I don't know the Australian regulations for handling Hendra containing samples, but in the US it is heavily regulated (both CDC and USDA).

Given that this is not you guys's first rodeo, I think everything is stored and secured properly, but I just wanted to do my due diligence,

Cheers,

Vincent Munster, PhD

Chief, Virus Ecology Section

Laboratory of Virology

Rocky Mountain Laboratories

NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 1 Oct 2019 10:00:36 -0600  
**To:** Schountz, Tony  
**Subject:** FW: Scanned image from Rocky MTN Labs  
**Attachments:** Sharp MX-4141N\_20191001\_093433.pdf

FYI,

Use this if the "official" letter doesn't arrive before the deadline. That one then has Dr. Holland's signature on it as well.

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

On 10/1/19, 9:59 AM, "NIAID RML LAN Support on behalf of niaidrmlansupport@<NIAIDRMLLANSupport@mail.nih.gov on behalf of mail.nih.gov niaidrmlansupport@mail.nih.gov> wrote:

Reply to: niaidrmlansupport@mail.nih.gov <niaidrmlansupport@mail.nih.gov>  
Device Name: Rocky MTN Labs  
Device Model: MX-4141N  
Location: Rocky MTN Labs

File Format: PDF (Medium)  
Resolution: 200dpi x 200dpi

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ROCKY MOUNTAIN LABORATORIES

Division of Intramural Research  
National Institute of Allergy  
and Infectious Diseases  
Laboratory of Virology  
Virus Ecology Unit

October 1, 2019

Subject: Support for R01 on mechanisms of henipavirus entry and pathogenesis

Dear Dr. Schountz,

I am very pleased to support the project: mechanisms of henipavirus entry and pathogenesis

My group has extensive experience and a wide variety of tools available to support the study of the mechanisms of henipavirus entry and pathogenesis. My group at the Rocky Mountain Laboratories (RML), Division of Intramural Research (DIR), NIAID, NTH, will perform critical in vitro and in vivo experiments in BSL4, to complement data produced in your laboratory. We will perform virus rescue of recombinant strains, perform infection of bat cells, and animal infections to evaluate pathogenesis.

We, Drs. Julia Port, Kwe Claude Yinda and Vincent Munster, will contribute approximately (b) (4), (b) (6) of our effort to this project, subject to availability of time and resources. Please note that this collaboration is part of my official duties as a federal employee at NIAID, NIH, and no funds from the grant will be used in intramural research, neither will I accept any form of remuneration, whether in the form of salary, honoraria, or travel expenses. I will provide scientific input (and mentoring) but will not have any duties associated with programmatic stewardship, which will be performed by the collaborators through a NIAID extramural program officer.

Further, in keeping with the mission of NIAID to promote and facilitate biomedical research and the dissemination of new knowledge, we would supply requested research materials and technical expertise not only to you, but also to other interested and qualified parties for research purposes. Approval for this collaboration has been granted by the DIR Director, Dr. Steven M. Holland

Sincerely,

(b) (6)

Vincent Munster, PhD  
Chief, Virus Ecology Section, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH





**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 1 Oct 2019 09:57:37 -0600  
**To:** Thruston, Jeffrey (NIH/NIAID) [E]  
**Cc:** Schountz, Tony  
**Subject:** RO1 support letter  
**Attachments:** Schountz RO1 2019.doc

Dear Jeff,

Please find attached a support letter for clearance with Dr. Holland.

Let me know whether this is sufficient,

Regards,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



---

ROCKY MOUNTAIN LABORATORIES

Division of Intramural Research  
National Institute of Allergy  
and Infectious Diseases  
Laboratory of Virology  
Virus Ecology Unit

October 1, 2019

Subject: Support for R01 on mechanisms of henipavirus entry and pathogenesis

Dear Dr. Schountz,

I am very pleased to support the project: mechanisms of henipavirus entry and pathogenesis

My group has extensive experience and a wide variety of tools available to support the study of the mechanisms of henipavirus entry and pathogenesis. My group at the Rocky Mountain Laboratories (RML), Division of Intramural Research (DIR), NIAID, NTH, will perform critical *in vitro* and *in vivo* experiments in BSL4, to complement data produced in your laboratory. We will perform virus rescue of recombinant strains, perform infection of bat cells, and animal infections to evaluate pathogenesis.

We, Drs. Julia Port, Kwe Claude Yinda and Vincent Munster, will contribute approximately (b) (4) of our effort to this project, subject to availability of time and resources. Please note that this collaboration is part of my official duties as a federal employee at NIAID, NIH, and no funds from the grant will be used in intramural research, neither will I accept any form of remuneration, whether in the form of salary, honoraria, or travel expenses. I will provide scientific input (and mentoring) but will not have any duties associated with programmatic stewardship, which will be performed by the collaborators through a NIAID extramural program officer.

Further, in keeping with the mission of NIAID to promote and facilitate biomedical research and the dissemination of new knowledge, we would supply requested research materials and technical expertise not only to you, but also to other interested and qualified parties for research purposes. Approval for this collaboration has been granted by the DIR Director, Dr. Steven M. Holland

Sincerely,

Vincent Munster, PhD  
Chief, Virus Ecology Section, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH





**From:** Schountz, Tony  
**Sent:** Tue, 1 Oct 2019 15:45:18 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Subject:** Letter of support

Vinnie, my sponsored programs person tells me we need a letter of support from you for the henipavirus R01 that's due Friday. Apparently, it has to do with you not getting money to pay yourself and your staff. If you have a generic letter that could be tailored for the grant it would be great. If not, I can write some language and send it to you for revision to save you time. The title is:

Mechanisms of henipavirus entry and pathogenesis

Thanks

Tony

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 1 Oct 2019 09:41:10 -0600  
**To:** Plowright, Raina  
**Subject:** Re: Oz samples

Yes, also quite labor and time consuming (depending on the sample load),

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Tuesday, October 1, 2019 at 9:32 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Oz samples

PS we need on our agenda time to develop a comprehensive plan for serology for all groups...

On Oct 1, 2019, at 9:29 AM, Raina Plowright <[REDACTED] (b) (6)> wrote:

I think it's really critical that everyone gets a feel for how much work is involved... The field teams are screaming out for recognition. I wonder if we should do short presentations on how much work goes into every stage... Lets make the CVO thing a priority for right after the meeting. We can make a strategy with Ali... I think we can ask the NSW CVO very frankly what we can do...I don't think Ali is as comfortable with this but if she understands the time constraints she may be ok... also I can be the one who approaches the CVO so the pressure isn't on her.

On Oct 1, 2019, at 9:19 AM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

Sounds good,

Just as a reminder, that it doesn't make sense to wait too long. Then the TA2 will be in swing and we'll need to focus on that part of PREEMP. It will be very hard to commit resources (from my own lab) to this in a later stage as I'm already stretched quite thin. That said, we are working on even more automation of screening, but that's all pipeline development.

Not that there is any real need for worries, we'll make sure that the DARPA goals are met, just saying that we might revisit the plans. I just want to be open with you about what we can expect, as there

seems a big need for "data" but only few who can generate datasets big enough for the modelers to use (e.g. Luminex).

It's a bit the classic misunderstanding how much actual (hand-on) labor goes into generating the data, that's why I typically invite people to the lab so that they see how much actually goes into running an efficient lab operation.

Looking forward to BBAR!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Tuesday, October 1, 2019 at 7:49 AM  
**To:** "[REDACTED] (b) (6)" <[REDACTED] (b) (6)>  
**Subject:** Re: Oz samples

Ali wants to build trust first. We are at a point where we can revisit with the CVO and have that conversation.

Sent from my iPhone

On Oct 1, 2019, at 6:06 AM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

I see that, but obviously it would have been stronger to have that integrated in one dataset, as they are now very loosely connected.

I was under the assumption that one of the CVOs would actually be amendable to the full screening, anyway more to discuss,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Monday, September 30, 2019 at 8:25 PM  
**To:** "[REDACTED] (b) (6)" <[REDACTED] (b) (6)>  
**Subject:** Re: Oz samples



It is a worry but the data contribute to a range of questions upstream of genotype to phenotype. All the spatiotemporal dynamics and ecology and immunology. We have to focus on the other countries to get paramyxoviruses. If there is a way to do it within the range of known paramyxoviruses we may be ok but they don't want us to discover anything new.

Sent from my iPhone

On Sep 30, 2019, at 5:14 PM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:

Hi Raina,

It is a bit worrisome, that we can't do anything with the Oz samples for PREEMPT. On one hand that alleviates the need for being worried about overlap between CNH and PREEMPT, but we are not generating any data for PREEMPT either (but they are paying for this). I'm getting quite some pressure from the genotype to phenotype group, but have only limited amount of samples to screen (although I can throw in more African samples at any time).

I was a bit under the assumption that there were differences between the respective CVOs and that Ali was arranging that we could screen one sample set with the pan-paramyxo PCR as well (but apparently I was wrong about this). We are obviously sticking to the MTA Tas and are not screening any of the Oz samples, although I think that will prove to be potentially problematic for PREEMPT. It is not clear how much the Oz team gets paid from PREEMPT, but I assume quite a fair amount.

Let's keep this between the two for now, and see if there is something we can do to move this forward.

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 1 Oct 2019 09:37:41 -0600  
**To:** Plowright, Raina  
**Subject:** Re: Oz samples

Yes, obviously running a couple of field work programs I'm extremely well aware of the amount of logistic and hard work going into this. More importantly, for students and post-doc that the generation of the data often hampers them from having time to do data analyses as well.

That's why I'm typically a bit hesitant of people hiring personnel with just having data analyses in mind (e.g. genome data sets, field modelling dataset's). I have seen that too often in my career (typically with infectious disease phylodynamic analyses) that people blatantly taking other people's data (or generated by other people) and running away with all the analyses (and often the credit's).

Luckily, we are a pretty strong group with high standards. I mainly need to make sure that people get the credit / the analyses they worked hard for. Those would typically be the post-docs and students. For myself, I'm just really happy to be part of the team.

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Tuesday, October 1, 2019 at 9:29 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Oz samples

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Sounds good,

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Not that there is any real need for worries, we'll make sure that the DARPA goals are met, just saying that we might revisit the plans. I just want to be open with you about what we can expect, as there seems a big need for "data" but only few who can generate datasets big enough for the modelers to use (e.g. Luminex).

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Looking forward to BBAR!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Tuesday, October 1, 2019 at 7:49 AM  
**To:** "[REDACTED] (b) (6)" <[REDACTED] (b) (6)>  
**Subject:** Re: Oz samples

Ali wants to build trust first. We are at a point where we can revisit with the CVO and have that conversation.

Sent from my iPhone

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Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>

**Date:** Monday, September 30, 2019 at 8:25 PM

**To:** "[REDACTED] (b) (6)" <[REDACTED] (b) (6)>

**Subject:** Re: Oz samples

It is a worry but the data contribute to a range of questions upstream of genotype to phenotype. All the spatiotemporal dynamics and ecology and immunology. We have to focus on the other countries to get paramyxoviruses. If there is a way to do it within the range of known paramyxoviruses we may be ok but they don't want us to discover anything new.

Sent from my iPhone

On Sep 30, 2019, at 5:14 PM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

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Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



**From:** Letko, Michael (NIH/NIAID) [F]  
**Sent:** Mon, 30 Sep 2019 23:19:29 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Subject:** Re: Nature Reviews Microbiology manuscript draft  
**Attachments:** 2 NRM DRAFT 9\_26\_19\_RP\_KJO\_ML.docx

Attached is my updated version of the manuscript, taking into account Raina and Kevin's comments and changes.

I accepted all the changes, leaving just everybody's comments and my replies.

What's new:

1. A lot of re-structuring to make it more bat-focused
2. Added an abstract and conclusion
3. Both figures have been updated with new details
4. Added lots of references

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)

(b) (6)

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**From:** Kevin Olival <(b) (6)>  
**Date:** Thursday, September 26, 2019 at 3:41 PM  
**To:** "Plowright, Raina" <(b) (6)> "Letko, Michael (NIH/NIAID) [F]" <(b) (6)> "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)>  
**Subject:** Re: Nature Reviews Microbiology manuscript draft

Dear all,

Here are my edits and comments, on top of Raina's. Sorry for the delay. Great paper, and look forward to rapidly reviewing the next draft. Hope these changes are constructive. Please let me know next steps.



Cheers,  
Kevin

**Kevin J. Olival, PhD**  
*Vice President for Research*

EcoHealth Alliance  
460 West 34th Street – 17th floor  
New York, NY 10001

(b) (6) (direct)  
(b) (6) (mobile)  
1.212.380.4465 (fax)  
[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

*EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that promote conservation and prevent pandemics.*

On Sep 16, 2019, at 4:25 PM, Plowright, Raina <(b) (6)> wrote:

Here it is. Great paper — it will be a useful addition!  
I'm happy to do more on the intro and conclusion (if you decide to do a separate conclusion, which I support!) and abstract. My jet lag just set in so best to hand it to Kevin now and I'll let Michael send me the next version for more help on those summary sections. If you catch me as I fly home next Sunday morning European time I can get edits back quickly so you can meet the nrmicro deadline.  
Thanks again for including me.  
Raina

On Sep 16, 2019, at 7:56 PM, Plowright, Raina <(b) (6)> wrote:

Ha! Sitting in a vegan restaurant in Berlin working on this right now. I'm behind on schedule bc of a flaw in my plan... leaving for a meeting with no talk written. Hope to get this to you later today or tomorrow.

Sent from my iPhone

On Sep 16, 2019, at 7:38 PM, Letko, Michael (NIH/NIAID) [F] <(b) (6)> wrote:

Hi Kevin,

Sounds good. Thanks for the update!

-michael

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)  
(b) (6)

---

**From:** Kevin Olival <(b) (6)>  
**Date:** Sunday, September 15, 2019 at 12:30 AM  
**To:** "Letko, Michael (NIH/NIAID) [F]" <(b) (6)>  
**Cc:** "Plowright, Raina" <(b) (6)> "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)>  
**Subject:** Re: Nature Reviews Microbiology manuscript draft

Micheael,

I've been coordinating w Raina. She should finish her edits on Sunday, and I'll pick it up and edit at that point. We thought it would make sense to do this sequentially. I have a flight Monday so will try to work on this enroute, otherwise should be able to carve out some time while at my next meeting next week.

Cheers,  
Kevin

On Sep 10, 2019, at 12:28 AM, Letko, Michael (NIH/NIAID) [F] <(b) (6)> wrote:

Hi Raina,

The editor said we are limited to "about 140 references." So we have room to add more.

Cheers,  
-michael

--

Michael Letko, Ph.D

Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)  
(b) (6)

---

**From:** "Plowright, Raina" <(b) (6)>  
**Date:** Monday, September 9, 2019 at 10:05 AM  
**To:** "Letko, Michael (NIH/NIAID) [F]" <(b) (6)>  
**Cc:** Kevin Olival <(b) (6)> "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)>  
**Subject:** Re: Nature Reviews Microbiology manuscript draft

Hi Michael,  
Do you have a reference limit, and if so, are you at the limit?  
It will help me to know if I should suggest 3 or 4 refs for some concepts or just choose a single best pick.  
Raina

On Aug 27, 2019, at 2:11 PM, Letko, Michael (NIH/NIAID) [F] <(b) (6)> wrote:

Dear co-authors,

Attached is our draft of the bat-virus manuscript for Nature Reviews Microbiology. Please take a look at the manuscript and make changes wherever you see fit. If you want to include any references, just paste the PMID where you want and we will add them in through EndNote.

Ideally, we would like to submit the finalized manuscript to the editors sometime in the 3<sup>rd</sup> or 4<sup>th</sup> week of September (around 16<sup>th</sup>-27<sup>th</sup>).

**In general, our review briefs through several contemporary areas of bat-virus research, then highlights the knowledge gaps in those areas and poses ways to address them.** This larger scope and forward-thinking perspective is where our review is different from other bat-virus reviews. There are 3 sections:

- a. Lines 20-41: **Ecology section/box** (the editors suggested we keep it shorter but it could still use some expansion)
- b. Lines 47-273 **Molecular section** (species barriers and immunity)
  - a. With a figure of the types of cellular species barriers viruses must overcome

- b. followed by a **box on bat-animal models** (lines 278-290)
- c. Lines 301-422: **Virus surveillance and one health section**
  - a. With a figure on the future of virus discovery
  - b. Followed by a **box on the future of bat virus research** (lines 428-459)
    - i. Alternatively, we can form this box into a conclusion paragraph, which also fits

**In general, the current manuscript will benefit from the following:**

1. Preferably from the senior authors (Kevin, Raina, Vincent): broad-strokes statements in the introduction and conclusion, to help contextualize within the field.
2. More bat-virus-specific examples, where necessary
3. Transition statements to help link core concepts
4. Additional figures if you can think of any. We have 2 right now and 2 or 3 boxes, but most of the editor's ideas did not make sense (like a phylogenetic tree of all viruses) or have been done a thousand times over by every other review (factors influencing spillover).

Let us know if you have any questions or issues. It has been a team effort and we are excited to finally close in on submitting this review!

We look forward to your additions and changes!

Best,  
-michael

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)

(b) (6)

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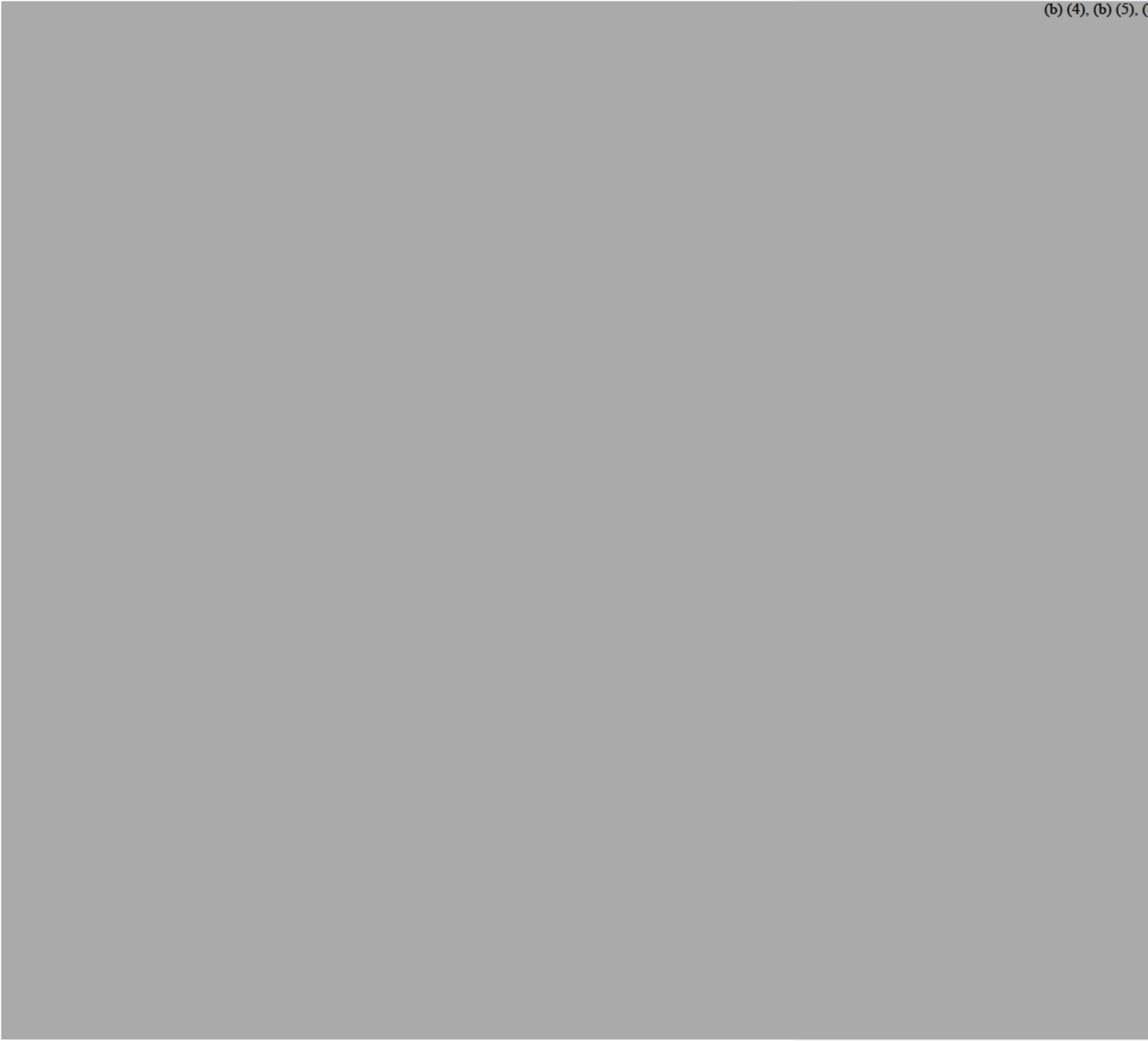
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(b) (4), (b) (5), (b) (6)

(b) (4), (b) (5), (b) (6)

(b) (4), (b) (5), (b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Mon, 30 Sep 2019 17:05:59 -0600  
**To:** Alison Peel  
**Cc:** Kwe Claude, Yinda (NIH/NIAID) [F]; Plowright, Raina  
**Subject:** Re: [REDACTED] (b) (4)

Thanks Ali,

That is obviously clear as it is part of the MTA, [REDACTED] (b) (4)  
for further virus work,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Alison Peel <[REDACTED] (b) (6)>  
**Date:** Monday, September 30, 2019 at 5:01 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** "Kwe Claude, Yinda (NIH/NIAID) [F]" <[REDACTED] (b) (6)> "Plowright, Raina" <[REDACTED] (b) (6)>  
**Subject:** Re: [REDACTED] (b) (4)

Hi Vincent,

Thanks for correcting. I will take your word on that.

The previous version of events would have been extremely problematic for me personally and the project as a whole. I can't emphasise enough how important it is to stick to our word to the CVOs and the legal agreements that accompany that.

Hopefully this is something we can pursue with multiviral work here in Australia, or at RML after further discussions with CVOs.

Thanks  
Ali

On Tue, 1 Oct 2019 at 8:07 am, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:  
Sorry for the confusion, Kwe corrected me ☐

[REDACTED] (b) (4)

Let me know if there is movement on that front,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Alison Peel <[REDACTED] (b) (6)>  
**Date:** Monday, September 30, 2019 at 3:41 PM  
**To:** "[REDACTED] (b) (6)" <[REDACTED] (b) (6)> "Plowright, Raina"  
<[REDACTED] (b) (6)>  
**Cc:** "Kwe Claude, Yinda (NIH/NIAID) [F]" <[REDACTED] (b) (6)> "[REDACTED] (b) (6)" <[REDACTED] (b) (6)>  
**Subject:** Re: [REDACTED] (b) (4)

Thanks for the update Vincent.

What primers are being used to detect these? We only have permission from the CVOs [REDACTED] (b) (4)

Thanks  
Ali

---

**From:** Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Sent:** Tuesday, October 1, 2019 7:24 am  
**To:** Plowright, Raina; Alison Peel  
**Cc:** Kwe Claude, Yinda (NIH/NIAID) [F]  
**Subject:** [REDACTED] (b) (4)

Hi guys,

Kwe is finding a number of [REDACTED] (b) (4)

<https://www.microbiologyresearch.org/content/journal/jgv/10.1099/vir.0.000099#tab2>

unfortunately [REDACTED] (b) (4) so we'll focus on that first

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Mon, 30 Sep 2019 15:03:07 -0600  
**To:** Seifert, Stephanie (NIH/NIAID) [E]; Letko, Michael (NIH/NIAID) [F]; Kwe Claude, Yinda (NIH/NIAID) [F]; Offei Owusu, Irene (NIH/NIAID) [F]; Matson, Jeremiah (NIH/NIAID) [F]; Avanzato, Victoria (NIH/NIAID) [F]; Jyothi Purushotham  
**Subject:** FW: Thomas Hoenen and Ali Groseth visit  
**Attachments:** Agenda-Groseth & Hoenen 10-6-19.docx

Hi guys,

Thomas and Ali from FLI are visiting,

I got us a slot at 3:30-4:30, Room 28/2A132 and I think it would be fun for each to give a short overview of their project etc,

Thomas is mainly working on filoviruses and Ali on bunyaviruses, they were postdocs here at RML (Heinz and Hideki) and are a lot of fun to talk with,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Mary Marsh <[REDACTED] (b) (6)>  
**Date:** Monday, September 30, 2019 at 11:56 AM  
**To:** Emmie De wit <[REDACTED] (b) (6)> Heinrich Feldmann <[REDACTED] (b) (6)>  
"Best, Sonja (NIH/NIAID) [E]" <[REDACTED] (b) (6)> "[REDACTED] (b) (6)"  
<[REDACTED] (b) (6)> "Broeckel, Rebecca (NIH/NIAID) [F]" <[REDACTED] (b) (6)>  
"Chiramel, Abhilash (NIH/NIAID) [E]" <[REDACTED] (b) (6)> "Asada, Wakako (NIH/NIAID) [F]" <[REDACTED] (b) (6)>  
**Subject:** RE: Thomas Hoenen and Ali Groseth visit

Hi all,

Please look at the attached agenda for Allison and Thomas' visit and let me know if there are any issues with your time slots.

Thanks!

Mary

---

**From:** De wit, Emmie (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Sent:** Wednesday, September 25, 2019 12:52 PM  
**To:** Peterson, Karin (NIH/NIAID) [E] <[REDACTED] (b) (6)> Feldmann, Heinrich (NIH/NIAID) [E] <[REDACTED] (b) (6)> Best, Sonja (NIH/NIAID) [E] <[REDACTED] (b) (6)> Munster, Vincent



(NIH/NIAID) [E] < [REDACTED] (b) (6) Marzi, Andrea (NIH/NIAID) [E] < [REDACTED] (b) (6)  
Bloom, Marshall (NIH/NIAID) [E] < [REDACTED] (b) (6)  
Cc: Marsh, Mary (NIH/NIAID) [C] < [REDACTED] (b) (6)

**Subject:** Thomas Hoenen and Ali Groseth visit

As most of you know, Thomas and Ali will be returning to Hamilton and RML for a short visit soon. Ali will give a talk on Monday 10/7, and Thomas will give a talk on Tuesday 10/8. They have indicated that they would like to meet with the LV PI's and Karin on Monday (they suggested meeting the PIs together so the burden on your schedule is relatively low). Heinz and I decided to give each of you a 1 hour timeslot, which you can then decide to use up on your own, or share with your lab.

Please let us know if you would like to meet with Thomas and Ali on Monday 10/6 and if so, what time would work best for you.

Thanks,  
Emmie

## Agenda

### Monday 10/7

8:00-8:15 am	Arrive at RML campus Visitor Center (will need Photo ID) Contact Mary Marsh (b) (6) or Kay Menk (b) (6)
8:15-8:30	Meet with Brian Taggart for WB/B1 paperwork
8:30-9:00	Rebecca Broeckel, Room 28/2A134
9:00-10:00	Heinz Feldmann, Room 28/2A100
10:00-10:30	Abhilash, Room 28/2A134
10:45-11:00	Set up for presentation, Room 28/1A181
11:00-12:00	Presentation, Room 28/1A181
12:00-1:30	TBD
1:30-2:30	Sonja Best, Room 28/2A128
2:30-3:30	Emmie de Wit, Room ?28/1A126?
3:30-4:30	Vincent Munster, Room 28/2A132
4:30-5:00	Waka Asada, Room 28/1A183
Dinner	TBD

### Tuesday 10/8

8:30-8:45 am	Arrive at RML campus Visitor Center (will need Photo ID) Contact Mary Marsh (b) (6) or Kay Menk (b) (6)
8:45-9:00	Set up for presentation, Room 28/1A181
9:00-10:00	Presentation, Room 28/1A181

**From:** Plowright, Raina  
**Sent:** Mon, 30 Sep 2019 15:05:33 +0000  
**To:** Alison Peel  
**Cc:** Munster, Vincent (NIH/NIAID) [E]  
**Subject:** Re: Grant for collaborative work with AAHL

Sounds very worth pursuing. How about for the [REDACTED] (b) (4)

On Sep 29, 2019, at 11:59 PM, Alison Peel <[REDACTED] (b) (6)> wrote:

Hi both,

I just noticed this advertisement below in the Wildlife Health Australia newsletter for a grant for undertaking work with AAHL. There is a pool of AUD \$50K available for undertaking bench-ready projects in collaboration with AAHL. This can cover in-kind support and consumables. While it might have been useful for something like [REDACTED] (b) (4) to allow responsive sampling during spillovers, the projects need to be completed by June 2020, and that's unlikely. Alternatively, viral isolation or deep sequencing/metagenomics might be an avenue to pursue.

Given various other commitments in the next month, I'd need to pull the application together in limited time, but if you think it's worth pursuing, I could contact Michelle Baker/Kim Halpin/others at AAHL

Cheers

Ali

----- Forwarded message -----

## **– Australian Animal Health Laboratory Science Merit Access Program [Submission Close Thursday 31 October 2019]**

Owned and operated by CSIRO on behalf of the nation, the Australian Animal Health Laboratory (AAHL) is Australia's national biocontainment facility. The purpose-built facility enables the highest levels of biocontainment research, helping to protect Australia's livestock and aquatic industries, as well as people, from emerging infectious disease threats.

**The second round of the AAHL Science Merit Access Program has opened.**

**Statement of Purpose:** The Merit Access Program invites Australian research organisations wishing to access AAHL's capabilities, to conduct high impact research of national importance on animal and zoonotic diseases that require high levels of biocontainment.

**Benefits:** Through the program, AAHL will provide in-kind support to successful projects in the form of research collaboration with AAHL Facility staff and laboratory access, as well as a small budget for project consumables (up to \$20k). All submissions will be subject to the availability of staff and resources, in addition to facility regulatory requirements.

Research proposals must be capable of being completed by 30 June 2020, however this round is also inviting open EOIs potentially suitable for future rounds of the AAHL Science Merit Program.

**Eligibility and conditions:** The program guidelines and application form are attached

Applications close **Thursday 31<sup>st</sup> October 2019**. Please direct any enquiries or submissions (b) (6)

<AAHL application form.docx><AAHL-Merit-Access-Program-Guidelines-201920-V2-final-2.pdf>

**From:** Wang Linfa  
**Sent:** Sat, 28 Sep 2019 14:19:03 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]; James Wood  
**Subject:** RE: PaKi cellines

Great, see you in December!

*Linfa (Lin-Fa) WANG, PhD FTSE*  
**Professor & Director**  
**Programme in Emerging Infectious Disease**  
**Duke-NUS Medical School,**  
**8 College Road, Singapore 169857**  
**Tel:** (b) (6)

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Saturday, 28 September 2019 9:45 PM  
**To:** Wang Linfa <(b) (6)> James Wood <(b) (6)>  
**Subject:** Re: PaKi cellines

Thanks Linfa,

And yes I'll be in Singapore together with Emmie,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Wang Linfa <(b) (6)>  
**Date:** Friday, September 27, 2019 at 11:02 PM  
**To:** "(b) (6)" <(b) (6)> James Wood <(b) (6)>  
**Subject:** RE: PaKi cellines

James it right. It is from P. Alecto.

See paper with detailed method.

The cell line is immortalized one.

Hope that helps and hope you or your team members can come to SG for the Nipah@20 conference. Here is the website for registration etc: [www.nipah2019.com](http://www.nipah2019.com)

Pls circulate to anyone interested. Thanks

LF

**Linha (Lin-Fa) WANG, PhD FTSE**  
**Professor & Director**  
**Programme in Emerging Infectious Disease**  
**Duke-NUS Medical School,**  
**8 College Road, Singapore 169857**  
Tel: (b) (6)

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Saturday, 28 September 2019 3:11 AM  
**To:** James Wood <(b) (6)> Wang Linfa <(b) (6)>  
**Subject:** Re: PaKi cellines

Good point,

I'll ask Michelle,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** James Wood <(b) (6)>  
**Date:** Friday, September 27, 2019 at 1:08 PM  
**To:** "(b) (6)" <(b) (6)> Wang Linfa <(b) (6)>  
(b) (6)  
**Subject:** RE: PaKi cellines

Hi Vincent

I had a mental blank about these and asked Andrew who wonders whether they are in fact p.alectus at AAHL

If this is the case, then you might be best using Michelle Baer

Let me now if I can help

Best wishes

James

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** 27 September 2019 17:47



**To:** Wang Linfa <[REDACTED] (b) (6)> James Wood <[REDACTED] (b) (6)>  
**Subject:** PaKi cellines

Dear Linfa and James,

I was wondering whether the PaKi cells mentioned in your paper of the isolation of paramyxoviruses from Eidolon bats is available for sharing. I'm currently running a virus discovery program with Allison Peel and Raina Plowright of samples from Australia and Bangladesh and it would be a nice tool for isolation of potential paramyxoviruses in these samples,

Let me know whether you are willing to share (acknowledging that these are primary cells), or whether you have an immortalized variant of the cells,

Kind regards,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

Important: This email is confidential and may be privileged. If you are not the intended recipient, please delete it and notify us immediately; you should not copy or use it for any purpose, nor disclose its contents to any other person. Thank you.

---

Important: This email is confidential and may be privileged. If you are not the intended recipient, please delete it and notify us immediately; you should not copy or use it for any purpose, nor disclose its contents to any other person. Thank you.

**From:** Wang Linfa  
**Sent:** Sat, 28 Sep 2019 05:01:27 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]; James Wood  
**Subject:** RE: PaKi cellines  
**Attachments:** JGV-Barr et al 2012 MenPV in bats.pdf

James it right. It is from P. Alecto.

See paper with detailed method.

The cell line is immortalized one.

Hope that helps and hope you or your team members can come to SG for the Nipah@20 conference. Here is the website for registration etc: [www.nipah2019.com](http://www.nipah2019.com)

Pls circulate to anyone interested. Thanks

LF

*Linfa (Lin-Fa) WANG, PhD FTSE*  
**Professor & Director**  
**Programme in Emerging Infectious Disease**  
**Duke-NUS Medical School,**  
**8 College Road, Singapore 169857**  
**Tel:** (b) (6)

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Saturday, 28 September 2019 3:11 AM  
**To:** James Wood <(b) (6)> Wang Linfa <(b) (6)>  
**Subject:** Re: PaKi cellines

Good point,

I'll ask Michelle,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** James Wood <(b) (6)>  
**Date:** Friday, September 27, 2019 at 1:08 PM  
**To:** "(b) (6)" <(b) (6)> Wang Linfa <(b) (6)>



(b) (6)

**Subject:** RE: PaKi cellines

Hi Vincent

I had a mental blank about these and asked Andrew who wonders whether they are in fact p.alectus at AAHL

If this is the case, then you might be best using Michelle Baer

Let me know if I can help

Best wishes

James

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>

**Sent:** 27 September 2019 17:47

**To:** Wang Linfa <(b) (6)> James Wood <(b) (6)>

**Subject:** PaKi cellines

Dear Linfa and James,

I was wondering whether the PaKi cells mentioned in your paper of the isolation of paramyxoviruses from Eidolon bats is available for sharing. I'm currently running a virus discovery program with Allison Peel and Raina Plowright of samples from Australia and Bangladesh and it would be a nice tool for isolation of potential paramyxoviruses in these samples,

Let me know whether you are willing to share (acknowledging that these are primary cells), or whether you have an immortalized variant of the cells,

Kind regards,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

Important: This email is confidential and may be privileged. If you are not the intended recipient, please delete it and notify us immediately; you should not copy or use it for any purpose, nor disclose its contents to any other person. Thank you.

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 27 Sep 2019 13:12:17 -0600  
**To:** Laing, Eric  
**Cc:** Broder, Chris (USU-DoD)  
**Subject:** Re: Email address Lianying Yan

Yes that would make sense, our Biosafety is a bit of stickler. Mostly because we have access to containment,

Btw, as soon as I find new paramyxos I'll send the sequencing data to you. Running a big screen in Australia and Bangladesh, very likely we discover some new ones

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Eric Laing <[REDACTED] (b) (6)>  
**Date:** Friday, September 27, 2019 at 1:09 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** "Broder, Chris (USU-DoD)" <[REDACTED] (b) (6)>  
**Subject:** Re: Email address Lianying Yan

Our IBC reviewed the work and gave it the BSL-2 thumbs up based on how we wrote the description of the virus. I wish we had a BSL-3.

I'm interested to see how the chimeras (rCedV-NiV P), and recombinant Ghana virus, I'm proposing to make in the submission with you and Tony are reviewed. I'm proposing all rescues are completed in BSL-4, but we should be able to construct the antigenome cDNA clones at BSL-2.

Eric D. Laing, Ph.D.  
Research Assistant Professor  
Department of Microbiology and Immunology  
Uniformed Services University  
4301 Jones Bridge Road  
Bethesda, MD 20814  
cell: [REDACTED] (b) (6)  
office: [REDACTED] (b) (6)  
lab: [REDACTED] (b) (6)

[REDACTED] (b) (6)

On Fri, Sep 27, 2019 at 3:05 PM Munster, Vincent (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:  
Yeah, did realize that. I was just wondering whether biosafety still would make you handle it at 3,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Broder, Christopher" <[REDACTED]> (b) (6)  
**Date:** Friday, September 27, 2019 at 11:52 AM  
**To:** Eric Laing <[REDACTED]> (b) (6)  
**Cc:** "[REDACTED]" <[REDACTED]> (b) (6) <[REDACTED]> (b) (6)  
**Subject:** Re: Email address Lianying Yan

its been BSL2 because we rescued it. its not derived from the BSL4 stock sent from AAHL

On Fri, Sep 27, 2019 at 1:33 PM Laing, Eric <[REDACTED]> (b) (6) wrote:  
Our recombinant Cedar has always been BSL-2.

Eric D. Laing, Ph.D.  
Research Assistant Professor  
Department of Microbiology and Immunology  
Uniformed Services University  
4301 Jones Bridge Road  
Bethesda, MD 20814  
cell: [REDACTED] (b) (6)  
office: [REDACTED] (b) (6)  
lab: [REDACTED] (b) (6)

[REDACTED] (b) (6)

On Fri, Sep 27, 2019 at 1:30 PM Munster, Vincent (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:  
Thanks!

Onwards to more cool stuff together!

Btw, did you get your Cedar ever downgraded to BSL2?

Vincent Munster, PhD

Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Eric Laing <(b) (6)>  
**Date:** Friday, September 27, 2019 at 11:28 AM  
**To:** "(b) (6) <(b) (6)>  
**Cc:** "Broder, Chris (USU-DoD)" <(b) (6)> "Sterling, Spencer"  
(b) (6)  
**Subject:** Re: Email address Lianying Yan

Hi Vincent,

(b) (6)

Eric D. Laing, Ph.D.  
Research Assistant Professor  
Department of Microbiology and Immunology  
Uniformed Services University  
4301 Jones Bridge Road  
Bethesda, MD 20814  
cell: (b) (6)  
office: (b) (6)  
lab: (b) (6)

(b) (6)

On Fri, Sep 27, 2019 at 1:24 PM Munster, Vincent (NIH/NIAID) [E] <(b) (6)> wrote:  
Hi guys,

Do you have the email address of Lianying for me? Submitting the JID paper today, but need an email address of her,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

--  
**Christopher C. Broder, Ph.D.**

Professor and Chair

Department of Microbiology and Immunology

Uniformed Services University, B4152

4301 Jones Bridge Rd, Bethesda, MD 20814-4799

USU is "America's Medical School"

Email: [REDACTED] (b) (6)

<https://www.usuhs.edu/national/faculty/christopher-broder-phd>

TEL: [REDACTED] (b) (6)

FAX: 301-295-3773

Lucille Washington

Administrative Officer

email - [REDACTED] (b) (6)

phone - [REDACTED] (b) (6)

fax - 301-295-3773

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**From:** Rasmussen, Angela L.  
**Sent:** Thu, 26 Sep 2019 20:05:23 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]; van Doremalen, Neeltje (NIH/NIAID) [E]  
**Subject:** Slides  
**Attachments:** hDPP4 Data Analysis.pptx





















**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 24 Sep 2019 10:19:04 -0600  
**To:** Schountz, Tony  
**Subject:** Re: Aj sera

Thanks!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 10:18 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

OK, I think Miles will be sending you 0.5 ml from 7 different bats.

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 10:17 AM  
**To:** "Schountz, Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

That should be fine

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories



NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 10:14 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

Vinnie, can we ship sera from Aj bats challenged with MERS-CoV and a few mutants? They were all seronegative and we did not detect viral RNA in them. The samples have been heat inactivated at 60C for 30 min.

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)

[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 9:47 AM  
**To:** "Schountz, Tony" <[REDACTED] (b) (6)> "Bushmaker, Trenton (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)> Miles Eckley <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

Hi Miles,

Can you ship I to:

Vincent Munster  
Rocky mountain Laboratories,  
903S 4<sup>th</sup> street, Hamilton, MT, 59840

Shipping on cold-packs is perfect!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology

Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 9:43 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)> Miles Eckley <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

Oops, meant to cc my tech, Miles. He'll be getting the package together.

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 9:41 AM  
**To:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

Hi Vinnie,

We're shipping serum samples today. Can you provide your shipping address? Cold packs ok, right (i.e., not on dry ice)?

Tony

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Friday, September 20, 2019 at 2:01 PM  
**To:** "Schountz, Tony" <(b) (6)>  
**Cc:** Victoria Avanzato <(b) (6)>  
**Subject:** Re: Biosketch

Then 4 times 0.5 would then be what we are aiming for, we would like to get replicates from individual animal rather than pooled sera

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <(b) (6)>  
**Date:** Friday, September 20, 2019 at 1:56 PM  
**To:** '(b) (6) <(b) (6)>  
**Cc:** Victoria Avanzato <(b) (6)>  
**Subject:** Re: Biosketch

If you mean 1 ml from 4 different bats, we probably don't have that much from an individual bat. When we euthanize, we typically get about a half ml of serum from cardiac puncture under deep anesthesia. If we can pool, then we can easily get four 1 ml aliquots.

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Friday, September 20, 2019 at 1:54 PM  
**To:** "Schountz, Tony" <(b) (6)>

**Cc:** Victoria Avanzato <[REDACTED]> (b) (6)

**Subject:** Re: Biosketch

Hey Tony,

Do you still have ~ 4 x 1 ML sera from Artibeus? We are working on a cool story of glycosylation patterns on bat antibodies (comparing Rousettus, Artibeus and Pteropus).

We need ~ 4 replicates, either we wait until the Florida bats come in and harvest some fresh tissues or if you still have some laying around from one of the previous studies (or from animals which need to be euthanized) than that would be awesome,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED]> (b) (6)

**Date:** Friday, September 20, 2019 at 12:10 PM

**To:** '[REDACTED]' <[REDACTED]> (b) (6) <[REDACTED]> (b) (6)

**Subject:** Re: Biosketch

Awesome – thank you, my man!

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

[REDACTED] (b) (6)

[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED]> (b) (6)

**Date:** Friday, September 20, 2019 at 12:09 PM

**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

attached biosketch

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 11:43 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

October 5, but really October 3!

Thanks,

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 11:43 AM  
**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

When is your submission deadline?

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories

NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>

**Date:** Friday, September 20, 2019 at 11:19 AM

**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>

**Subject:** Biosketch

Hi Vinnie,

I'll need your current NIH biosketch for the henipaviruse submission. Do you also need to provide other supporting documents (e.g., no salary support)?

Thanks,

T.

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

[REDACTED] (b) (6)

[REDACTED] (b) (6)



**From:** Schountz, Tony  
**Sent:** Tue, 24 Sep 2019 16:14:58 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Subject:** Re: Aj sera

I don't think they were even infected. We used viruses Susan sent us that infect Vero cells but I don't think the bats were susceptible to them.

---

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
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College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

---

**From:** "Schountz, Tony" <(b) (6)>  
**Date:** Tuesday, September 24, 2019 at 10:13 AM  
**To:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>  
**Subject:** Re: Aj sera

Vinnie, can we ship sera from Aj bats challenged with MERS-CoV and a few mutants? They were all seronegative and we did not detect viral RNA in them. The samples have been heat inactivated at 60C for 30 min.

T.

---

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Tuesday, September 24, 2019 at 9:47 AM  
**To:** "Schountz, Tony" <(b) (6)> "Bushmaker, Trenton (NIH/NIAID) [E]" <(b) (6)>

**Cc:** Victoria Avanzato <[REDACTED] (b) (6)> Miles Eckley <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

Hi Miles,

Can you ship I to:

Vincent Munster  
Rocky mountain Laboratories,  
903S 4<sup>th</sup> street, Hamilton, MT, 59840

Shipping on cold-packs is perfect!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 9:43 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)> Miles Eckley <[REDACTED] (b) (6)>  
**Subject:** Re: Aj sera

Oops, meant to cc my tech, Miles. He'll be getting the package together.

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 24, 2019 at 9:41 AM  
**To:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>



**Cc:** Victoria Avanzato <[REDACTED]> (b) (6)

**Subject:** Re: Aj sera

Hi Vinnie,

We're shipping serum samples today. Can you provide your shipping address? Cold packs ok, right (i.e., not on dry ice)?

Tony

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED]> (b) (6)

**Date:** Friday, September 20, 2019 at 2:01 PM

**To:** "Schountz,Tony" <[REDACTED]> (b) (6)

**Cc:** Victoria Avanzato <[REDACTED]> (b) (6)

**Subject:** Re: Biosketch

Then 4 times 0.5 would then be what we are aiming for, we would like to get replicates from individual animal rather than pooled sera

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED]> (b) (6)

**Date:** Friday, September 20, 2019 at 1:56 PM

**To:** '[REDACTED] (b) (6) <[REDACTED]> (b) (6)

**Cc:** Victoria Avanzato <[REDACTED]> (b) (6)

**Subject:** Re: Biosketch

If you mean 1 ml from 4 different bats, we probably don't have that much from an individual bat. When we euthanize, we typically get about a half ml of serum from cardiac puncture under deep anesthesia. If we can pool, then we can easily get four 1 ml aliquots.

T.

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College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

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**From:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Friday, September 20, 2019 at 1:54 PM  
**To:** "Schountz,Tony" <(b) (6)>  
**Cc:** Victoria Avanzato <(b) (6)>  
**Subject:** Re: Biosketch

Hey Tony,

Do you still have ~ 4 x 1 ML sera from Artibeus? We are working on a cool story of glycosylation patterns on bat antibodies (comparing Rousettus, Artibeus and Pteropus).

We need ~ 4 replicates, either we wait until the Florida bats come in and harvest some fresh tissues or if you still have some laying around from one of the previous studies (or from animals which need to be euthanized) than that would be awesome,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <(b) (6)>  
**Date:** Friday, September 20, 2019 at 12:10 PM  
**To:** '(b) (6)' <(b) (6)>  
**Subject:** Re: Biosketch

Awesome – thank you, my man!

T.

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>

**Date:** Friday, September 20, 2019 at 12:09 PM

**To:** "Schountz,Tony" <(b) (6)>

**Subject:** Re: Biosketch

attached biosketch

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Tony Schountz <(b) (6)>

**Date:** Friday, September 20, 2019 at 11:43 AM

**To:** '(b) (6)' <(b) (6)>

**Subject:** Re: Biosketch

October 5, but really October 3!

Thanks,

T.

—

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Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
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(b) (6)  
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**Date:** Friday, September 20, 2019 at 11:43 AM

**To:** "Schountz, Tony" <(b) (6)>

**Subject:** Re: Biosketch

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Vincent Munster, PhD  
Chief, Virus Ecology Section  
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**Date:** Friday, September 20, 2019 at 11:19 AM

**To:** '(b) (6) <(b) (6)>

**Subject:** Biosketch

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College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)  
(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 24 Sep 2019 08:45:19 -0600  
**To:** Broder, Chris (USU-DoD)  
**Cc:** Eric Laing  
**Subject:** Re: Paper for JID supplement

Thanks guys, If you give me the DTRA grant # I'll incorporate it into the funding

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Broder, Christopher" <[REDACTED] (b) (6)>  
**Date:** Monday, September 23, 2019 at 7:17 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** Eric Laing <[REDACTED] (b) (6)>  
**Subject:** Re: Paper for JID supplement

hi Vincent,

Many thanks, sry we could not coordinate one version of comments,  
i was out of town,.

please see attached,

note: to be technically and politically correct. The proteins for the bioplex are made with additional support from the DTRA project (Jon is PI). And when we ended up arranging Eric's visit to RML, we had to use that DTRA support for Eric's travel with Jon's OK because the other funds fell through,

I can ping Jon and remind / explain if you wish.

v/r  
Chris

On Wed, Sep 18, 2019 at 5:58 PM Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:  
Hope to see you guys in Singapore!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



---

**From:** "Broder, Christopher" <[REDACTED] (b) (6)>  
**Date:** Wednesday, September 18, 2019 at 3:42 PM  
**To:** "[REDACTED] (b) (6)" <[REDACTED] (b) (6)>  
**Cc:** Eric Laing <[REDACTED] (b) (6)>  
**Subject:** Re: Paper for JID supplement

Terrific Vincent,

will do.  
CB

On Mon, Sep 16, 2019 at 4:32 PM Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:  
Dear co-authors,

Please find attached for review the manuscript on Henipavirus and filovirus screening of our Trinidad bat cohort.

Paper is pretty straight forward, no PCR positives (and a bit supplemental info on an updated pan-filo assay) but a couple of henipa and filo virus serological hits (but nothing could be confirmed).

Simon: can you send this to Alexander?

Eric: can you send this to Spencer and Lianying?

Christine: can you send this to Jerome?

Given that this is a very straightforward paper and I'm up to an end of this month deadline for JID submission, I would like to submit by the end of next week. Please also fill out the COI form, or reply to me whether you have conflicts of interest.

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

--

**Christopher C. Broder, Ph.D.**  
Professor and Chair  
Department of Microbiology and Immunology  
Uniformed Services University, B4152  
4301 Jones Bridge Rd, Bethesda, MD 20814-4799

USU is "America's Medical School"

Email: [REDACTED] (b) (6)

<https://www.usuhs.edu/national/faculty/christopher-broder-phd>

TEL: [REDACTED] (b) (6)

FAX: 301-295-3773

Lucille Washington

Administrative Officer

email - [REDACTED] (b) (6)

phone - [REDACTED] (b) (6)

fax - 301-295-3773

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--

**Christopher C. Broder, Ph.D.**

Professor and Chair

Department of Microbiology and Immunology

Uniformed Services University, B4152

4301 Jones Bridge Rd, Bethesda, MD 20814-4799

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Lucille Washington

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**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 20 Sep 2019 15:00:55 -0600  
**To:** Rasmussen, Angela L.  
**Cc:** De wit, Emmie (NIH/NIAID) [E]  
**Subject:** Re: Visit to RML

Perfect!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Angie Rasmussen <[REDACTED]> (b) (6)  
**Date:** Friday, September 20, 2019 at 2:57 PM  
**To:** '[REDACTED]' <[REDACTED]> (b) (6) <[REDACTED]> (b) (6)  
**Cc:** Emmie De wit <[REDACTED]> (b) (6)  
**Subject:** Re: Visit to RML

LOL okay, perfect! That's outdoorsy (check—Alexei wanted to do something at least hiking-adjacent) and obv we're both down for anything called "beer fest." What should we bring? (I assume beer, but you never know). Alexei doesn't have any leiderhosen and last I was in Germany I declined to buy a St. Pauli girl outfit, but we'll make up for our quotidian wardrobe with plenty of Oktoberfest enthusiasm!

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED]> (b) (6)  
**Date:** Friday, September 20, 2019 at 4:50 PM  
**To:** "Rasmussen, Angela L." <[REDACTED]> (b) (6)  
**Cc:** Emmie De wit <[REDACTED]> (b) (6)  
**Subject:** Re: Visit to RML

Lets do Saturday! There will be a RML beer fest at Como, Alexei will love it. Think it starts 2:00 – 2:30 and I'll be wearing my Oktoberfest outfit!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Angie Rasmussen <[REDACTED]> (b) (6)  
**Date:** Friday, September 20, 2019 at 9:40 AM



**To:** '(b) (6)' <(b) (6)>

**Subject:** Visit to RML

Also, Alexei will be coming for a weekend getaway on Friday afternoon and he wants to grab a beer. We'll be around until Sunday late morning/early afternoon if you (and Emmie) are free!

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 20 Sep 2019 14:47:55 -0600  
**To:** Rasmussen, Angela L.; van Doremalen, Neeltje (NIH/NIAID) [E]  
**Subject:** Re: Visit to RML next week

Either Thursday or Friday would work for me

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Angie Rasmussen <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 9:39 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)> Neeltje van Doremalen  
<[REDACTED] (b) (6)>  
**Subject:** Visit to RML next week

Hi Vincent and Neeltje,

I'm going to be at RML next Thursday afternoon and Friday all day. I'd love to get together and discuss the MERS-CoV DARPA data. I've wrapped up analysis on the transcriptomics, proteomics, and metabolomics, and I think we are at a place now where we can begin writing up a paper. Do you have some time either of those days to sit down with the data and run through it?

Cheers,  
Angie

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 20 Sep 2019 14:04:14 -0600  
**To:** Schountz, Tony  
**Cc:** Victoria Avanzato; Miles Eckley  
**Subject:** Re: Biosketch

perfect

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 2:03 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)> Miles Eckley <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

Got it. We'll get those shipped to you early next week. Ship on cold packs ok?

Tony

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 2:01 PM  
**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

Then 4 times 0.5 would then be what we are aiming for, we would like to get replicates from individual animal rather than pooled sera

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 1:56 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

If you mean 1 ml from 4 different bats, we probably don't have that much from an individual bat. When we euthanize, we typically get about a half ml of serum from cardiac puncture under deep anesthesia. If we can pool, then we can easily get four 1 ml aliquots.

T.

---

Tony Schountz, PhD  
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Colorado State University  
3185 Rampart Road  
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[REDACTED] (b) (6)  
[REDACTED] (b) (6)

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**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 1:54 PM  
**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Cc:** Victoria Avanzato <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

Hey Tony,

Do you still have ~ 4 x 1 ML sera from Artibeus? We are working on a cool story of glycosylation patterns on bat antibodies (comparing Rousettus, Artibeus and Pteropus).

We need ~ 4 replicates, either we wait until the Florida bats come in and harvest some fresh tissues or if you still have some laying around from one of the previous studies (or from animals which need to be euthanized) than that would be awesome,

Cheers,

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NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 12:10 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

Awesome – thank you, my man!

T.

—  
Tony Schountz, PhD  
Associate Professor  
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[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 12:09 PM  
**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

attached biosketch

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 11:43 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

October 5, but really October 3!

Thanks,

T.

—

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[REDACTED] (b) (6)  
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**Date:** Friday, September 20, 2019 at 11:43 AM  
**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

When is your submission deadline?

Vincent Munster, PhD  
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Laboratory of Virology  
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NIAID/NIH

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**Date:** Friday, September 20, 2019 at 11:19 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Biosketch

Hi Vinnie,

I'll need your current NIH biosketch for the henipaviruse submission. Do you also need to provide other supporting documents (e.g., no salary support)?

Thanks,

T.

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(b) (6)

(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 20 Sep 2019 12:09:09 -0600  
**To:** Schountz, Tony  
**Subject:** Re: Biosketch  
**Attachments:** Biosketch Munster tony.docx

attached biosketch

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

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**Date:** Friday, September 20, 2019 at 11:43 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

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Arthropod-borne and Infectious Disease Laboratory  
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College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

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**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Friday, September 20, 2019 at 11:43 AM  
**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Biosketch

When is your submission deadline?

Vincent Munster, PhD



Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**Date:** Friday, September 20, 2019 at 11:19 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Biosketch

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—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

[REDACTED] (b) (6)

[REDACTED] (b) (6)

## BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Vincent J. Munster

eRA COMMONS USER NAME (credential, e.g., agency login): (b) (6)

POSITION TITLE: Chief, Virus Ecology Section

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Utrecht University	MSc	1999 - 2001	Molecular Microbiology
Erasmus University	PhD	2002 - 2006	Molecular Virology
Erasmus Medical Center	Postdoctoral	2006 - 2009	Influenza transmission
Rocky Mountain Laboratories, NIH/NIAID	Postdoctoral	2009 - 2012	Virus Ecology

### A. Personal statement

Past outbreaks of bat-borne zoonotic viruses such as coronaviruses, henipaviruses and filoviruses, have had an enormous impact on human and wildlife health. The unpredictability of the zoonotic introductions of these bat-borne limits the potential for effective intervention strategies. One of the main reasons for the absence of successful pre-emptive strategies is our lack of understanding of the ecology, evolution and interaction with the immune system of these pathogens in their respective natural reservoirs. This proposal will be the first of its kind to integrate bat host immunology with virology. While working in the field of avian influenza viruses, I have gained extensive laboratory and field experience. I have expanded my expertise over the last year towards the field of bat-borne zoonotic diseases (Ebola, Marburg, Nipah and MERS-CoV), conducting field studies in the Republic of Congo and Mali and experimental studies at the Rocky Mountain Laboratories high and maximum containment facility (BSL3 and BSL4). Within the NIAID Virus Ecology unit ([http://www.niaid.nih.gov/labsandresources/labs/aboutlabs/lv/virusecology/Pages/default.aspx#niaid\\_inlineNav\\_Anchor](http://www.niaid.nih.gov/labsandresources/labs/aboutlabs/lv/virusecology/Pages/default.aspx#niaid_inlineNav_Anchor)) my work focuses on natural reservoirs of emerging viruses and elucidation of the underlying biotic and abiotic drivers of zoonotic and cross-species transmission events. Over the last decade, I have a demonstrated record of accomplished and productive research resulting in over 140 peer-reviewed publications. My expertise in bat-borne viruses, the experience working at in the field and in maximum containment and the by me created infrastructure at RML to study bat-borne viruses in their natural reservoir have made me well positioned to contribute to the proposed project.

### B. Positions and Honors

#### Positions

2013 – Present Chief (tenured), Virus Ecology Section, Laboratory of Virology, Rocky Mountain Laboratories  
2009 – 2012 Post-doctoral fellow, Disease Modelling and Transmission Section, NIAID/NIH.  
2006 – 2009 Postdoctoral research fellow at the Department of Virology, Erasmus Medical Center.

#### Other Experiences and Professional Memberships

2018 DRC Ebola Outbreak: NIAID Internal Coordination Working Group  
2018 NIAID Viral Pathogen Preparedness Working Group  
2018 Scientific Advisory Board, DTRA Western Asia bat research project  
2017 FAO-OIE-WHO global technical meeting on MERS-CoV, Geneva  
2017 WHO Global Outbreak and Alert Network workshop meeting, Hong Kong  
2017 WHO Environmental Contamination of MERS-CoV meeting, Hong Kong  
2016 Graduate faculty appointment, Marshall University, Joan C. Edwards School of Medicine  
2016 PhD thesis examiner, University of Melbourne, Australia  
2015-2016 Member the Scientific Advisory Group of the NIAID workshop on MERS animal models

2015	Member the Scientific Advisory Group organizing the NIAID workshop on MERS animal models.
2015	Member of the ASPR SPIRiT Ebola environmental working group.
2015	Member of the ASPR Science Disaster Preparedness working group.
2014-2015	Team lead of the combined WHO - CDC/NIH diagnostic laboratory during the Ebola virus outbreak, Monrovia, Liberia.
2014	American Society for Virology, Program Planning Committee.
2014	Moderator, IOM/NRC Workshop on Research Priorities to Inform Public Health and Medical Practice for Domestic Ebola Virus Disease, Institute of Medicine of the National academy of Sciences.
2014	Organizer of the fifth ESWI Influenza Conference in Riga, Latvia.
2014	Scientific organizing committee of the Endemic and Emerging Viral Diseases of Priority in the Middle East and North Africa.
2013	WHO-ISARIC joint MERS-CoV Outbreak Readiness Workshop.
2013	Member Coronavirus Therapeutics Interagency Working Group (NIH, CDC, BARDA and DoD).
2013	Moderator, NIAID MERS-CoV Research: Current Status and Future Priorities Meeting.
2013	Editor for PLoS One, One Health and Frontiers in Cellular and Infection Microbiology
2011-2014	Board member of the European Scientific Working group on Influenza.
2008	Member of the OIE ad hoc Group on Wildlife Disease Surveillance.
2005-present	Reviewer for journals including: Lancet Infectious Diseases, Nature, Nature Medicine, PNAS and Science.

### Grant application reviewer

2019	AAAS for the Saudi Arabia's Ministry of Education Research
2018	BBSRC, UK
2018	Italian Ministry of Health
2017	BBSRC (Biotechnology and Biological Sciences Research Council), UK
2016	USAID Combating Zika and Future Threats Grand Challenge
2016	FINOVI Foundation, France
2015	Italian Ministry of Health
2015	Referee Panel for Health and Medical research Fund, HKSAR
2015	Human Frontier Science Program
2012	Referee Panel for Health and Medical research Fund, HKSAR
2008-2009	National Medical Research Council, Singapore
2008	Minnesota Center of Excellence for Influenza Research and Surveillance, USA
2007	Department for Environment, Food and Rural Affairs, UK

### Miscellaneous

2014-2015	Team lead of the combined CDC/NIH diagnostic laboratory under GOARN/WHO during the Ebola virus outbreak, Monrovia, Liberia, providing diagnostic services to several Ebola treatment units in the Monrovia area
2015-2018	Thompson Reuters / Clarivate highly cited researcher 2015, 2016, 2017 and 2018

### Honors

2016	European Society for Virology young investigator award
2015	NIH Director's award, in recognition of the establishment and running of diagnostic field laboratory during the Ebola virus outbreak in West Africa.
2014	NIAID merit award for the development of a nonhuman primate disease model and a treatment strategy for MERS-CoV
2014	ASM IAAC young investigator award
2014	NIH Director's award, in recognition of the exceptional and rapid response to the emergence of MERS-coronavirus.
2011	European Scientific Working group on Influenza, Best Body of Work award for Young Scientists.

## C. Contributions to Science

- 1 During my PhD working on avian influenza at Erasmus Medical Center, it became clear to me that there was a lack of integration between bench virology and fieldwork. Being trained as a "classical" molecular virologist I could very well answer questions on what mutations would make a virus more pathogenic, but the translation of this knowledge to real world situations remained elusive. Integrating various disciplines helped me to understand the ecology and drivers of avian influenza and pandemic influenza outbreaks.
  - Olsen B, **Munster VJ**, Wallensten A, Waldenstrom J, Osterhaus AD, Fouchier RA. Global patterns of influenza a virus in wild birds. Science. 2006;312(5772):384-8



- **Munster VJ**, Baas C, Lexmond P, Waldenstrom J, Wallensten A, Fransson T, Rimmelzwaan GF, Beyer WE, Schutten M, Olsen B, Osterhaus AD, Fouchier RA. Spatial, temporal, and species variation in prevalence of influenza A viruses in wild migratory birds. *PLoS Pathog.* 2007;3(5):e61. PMID: PMC1876497
- **Munster VJ**, de Wit E, van den Brand JM, Herfst S, Schrauwen EJ, Bestebroer TM, van de Vijver D, Boucher CA, Koopmans M, Rimmelzwaan GF, Kuiken T, Osterhaus AD, Fouchier RA. Pathogenesis and transmission of swine-origin 2009 A(H1N1) influenza virus in ferrets. *Science.* 2009;325(5939):481-3. PMID: PMC4814155.
- Herfst S, Schrauwen EJ, Linster M, Chutinimitkul S, de Wit E, **Munster VJ**, Sorrell EM, Bestebroer TM, Burke DF, Smith DJ, Rimmelzwaan GF, Osterhaus AD, Fouchier RA. Airborne transmission of influenza A/H5N1 virus between ferrets. *Science.* 2012;336(6088):1534-41. PMID: PMC4810786.

2 My research group at the Rocky Mountain Laboratories of the NAID/NIH is built around the concept of complete integration of fieldwork, experimental work and computational modeling to allow study of emerging viruses in their natural, intermediate and human hosts. It is clear that past outbreaks of zoonotic viruses have had an enormous impact on human and wildlife health and that the unpredictability of cross-species transmission events limits the potential for effective intervention strategies. My lab aims to identify the underlying changes in virus-host ecology that allow these viral pathogens to cross the species barrier. Recognizing the strengths and weaknesses of a unilateral focus on field research on one hand and experimental research on the other, we have combined both approaches in one research program. This integrated approach has contributed greatly to the rapid advancements in our knowledge on the emergence of Nipah virus. Using a combination of epidemiological data combined with animal modelling approaches we were able to delineate human-to-human transmissions and the neurotropic kinetics of Nipah virus. In addition, we have been successful in the development of a Nipah virus vaccine within the CEPI framework.

- De Wit E, Bushmaker T, Scott D, Feldmann H, **Munster VJ**. Nipah virus transmission in a hamster model. *PLoS Negl Trop Dis.* 2011;5(12):e1432. Doi: 10.1371/journal.pntd.0001432. PubMed PMID: 22180802; PMID: 3236726.
- **Munster VJ**, Prescott JB, Bushmaker T, Long D, Rosenke R, Thomas T, Scott D, Fischer ER, Feldmann H, de Wit E. Rapid Nipah virus entry into the central nervous system of hamsters via the olfactory route. *Sci Rep.* 2012;2:736. doi: 10.1038/srep00736. PubMed PMID: 23071900; PMID: 3471094.
- de Wit E, Prescott J, Falzarano D, Bushmaker T, Scott D, Feldmann H, **Munster VJ**. Foodborne transmission of nipah virus in Syrian hamsters. *PLoS Pathog.* 2014;10(3):e1004001. doi: 10.1371/journal.ppat.1004001. PubMed PMID: 24626480; PMID: 3953481.
- Neeltje van Doremalen, Teresa Lambe, Sarah Sebastian, Trenton Bushmaker, Robert Fischer, Friederike Feldmann, Elaine Haddock, Michael Letko, Vicky Avanzato, Rachel LaCasse, Dana Scott, Thomas A. Bowden, Sarah Gilbert, **Vincent Munster**. A single-dose ChAdOx1-vectored vaccine provides complete protection against Nipah Bangladesh and Malaysia in Syrian golden hamsters. *PLoS NTD* accepted

3 My research group was directly involved in the Ebola virus outbreak in West Africa by providing diagnostic support at the request of the WHO for several Ebola treatment units in Monrovia, Liberia. The emergence of Ebola virus in West Africa highlighted significant gaps in our knowledge, including fundamental ecological questions surrounding zoonotic and human-to-human transmission. In order to understand the drivers of transmission, we examined the stability of the virus within tissues and on body surfaces and determined the potential for transmission. The results from this study directly aided the interpretation of epidemiologic data collected from human corpses and are also applicable to interpreting samples collected from remains of wildlife infected with Ebola virus, especially nonhuman primates, and helped to assess the risk of zoonotic transmission.

- Mate SE, Kugelman JR, Nyenswah TG, Ladner JT, Wiley MR, Cordier-Lassalle T, Christie A, Schroth GP, Gross SM, Davies-Wayne GJ, Shinde SA, Murugan R, Sieh SB, Badio M, Fakoli L, Taweh F, de Wit E, van Doremalen N, **Munster VJ**, Pettitt J, Prieto K, Humrighouse BW, Stroher U, DiCiaro JW, Hensley LE, Schoepp RJ, Safronetz D, Fair J, Kuhn JH, Blackley DJ, Laney AS, Williams DE, Lo T, Gasasira A, Nichol ST, Formenty P, Kateh FN, De Cock KM, Bolay F, Sanchez-Lockhart M, Palacios G. Molecular Evidence of Sexual Transmission of Ebola Virus. *N Engl J Med.* 2015;373(25):2448-54. PMID: PMC4711355.
- de Wit E, Falzarano D, Onyango C, Rosenke K, Marzi A, Ochieng M, Juma B, Fischer RJ, Prescott JB, Safronetz D, Omballa V, Owuor C, Hoenen T, Groseth A, van Doremalen N, Zemtsova G, Self J, Bushmaker T, McNally K, Rowe T, Emery SL, Feldmann F, Williamson B, Nyenswah TG, Grolla A, Strong JE, Kobinger G, Stroher U, Rayfield M, Bolay FK, Zoon KC, Stassijns J, Tampellini L, de Smet M, Nichol ST, Fields B, Sprecher A, Feldmann H, Massaquoi M, **Munster VJ**. The Merits of Malaria Diagnostics during an Ebola Virus Disease Outbreak. *Emerg Infect Dis.* 2016;22(2). PMID: PMC4734533.
- de Wit E, Kramer S, Prescott J, Rosenke K, Falzarano D, Marzi A, Fischer RJ, Safronetz D, Hoenen T, Groseth A, van Doremalen N, Bushmaker T, McNally KL, Feldmann F, Williamson BN, Best SM, Ebihara H, Damiani IA, Adamson B, Zoon KC, Nyenswah TG, Bolay FK, Massaquoi M, Sprecher A, Feldmann H, **Munster VJ**. Clinical

Chemistry of Patients With Ebola in Monrovia, Liberia. J Infect Dis. 2016. doi: 10.1093/infdis/jiw187. PMID: PMC5050461.

- **Munster VJ**, Bausch DG, de Wit E, Fischer R, Kobinger G, Munoz-Fontela C, Olson SH, Seifert SN, Sprecher A, Ntouni F, Massaquoi M, Mombouli JV. Outbreaks in a Rapidly Changing Central Africa - Lessons from Ebola. N Engl J Med. 2018.

Publications in peer-reviewed journals: 139

Citations: >11000

H-factor: 46

**ORCID:** 0000-0002-2288-3196

**ResearcherID:** I-7607-2018

#### **D. Additional Information: Research Support**

##### **Ongoing Support**

2013-continous Munster PI 1ZIAAI001179-06

NIH, NIAID Division of Intramural Research support for the Virus Ecology Unit.

2013-2020 Munster PI 1ZIAAI001190-01

International Centers of Excellence in Research Center, Brazzaville, Republic of Congo.

2019-2022 (b) (4)

CEPI ChAd-Ox vaccine development for MERS-CoV, Nipah and Lassa virus

PI: Gilbert / Munster co-PI Role: preclinical evaluation of WHO blueprint infectious diseases

2018- 2022 (b) (4)

CEPI Lassa mRNA vaccine, CureVac, PADOVAX

Munster PI

2018- 2020

EDCTP (European & Developing Countries Clinical Trial Partnership). EDCTP2 Call for Proposals - Mobilization of research funds in case of Public Health Emergencies - RIA2018 Emergency Funding Mechanism Proposal: RIA2018EF-2082 — EPIRISK-EBOV.

PI: Ntouni / Munster co-PI Role: Ebolavirus spillover and surveillance in wildlife populations

2018- 2021

Department of Defense, DARPA grant 'PREEMPT' D18AC00031

PI: Plowright / Munster co-PI Role: Understanding phenotype and genotype drivers of pathogen spillover

2018- 2020

CEPI MERS-DNA vaccine "Translational portfolio program encompassing cGMP manufacturing and clinical development of DNA vaccine candidates against both Lassa virus and MERS coronavirus."

PI: Wiener / Munster co-PI Role: assessment of humoral response in phase I clinical trial for MERS-CoV

2016- 2019

Department of Defense, DARPA grant 'Thunder' Grant Number HR011-17-2-0009

PI: Lipkin / Munster co-PI Role: Characterization of severe and benign responses against MERS-COV infection in animal models.

2015-2016 (Munster Co-PI)

(b) (4), Improving Laboratory Capacity in the Republic of Congo as a Foundation for Understanding and Mitigating the Threat of Ebola to Great Apes and People.

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 20 Sep 2019 08:50:44 -0600  
**To:** Cisar, Alpie (NIH/OD/ORS) [E]; Kendall, Lon  
**Cc:** Schountz, Tony  
**Subject:** Re: Miami bats

Thanks,

Fingers crossed!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** "Cisar, Alpie (NIH/OD/ORS) [E]" <(b) (6)>  
**Date:** Friday, September 20, 2019 at 7:15 AM  
**To:** Lon Kendall <(b) (6)>  
**Cc:** '(b) (6) <(b) (6)> Tony Schountz  
<(b) (6)>  
**Subject:** RE: Miami bats

Ok, thanks, working on submitting information regarding the research to Miami for them to make a final determination on if they are going to transfer the bats to us or not.

Will keep you posted on any developments.

Alf

Alpie Cisar, LATG   
NHP & Large Animal Procurement Specialist and Resource Manager  
DVR, ORS  
NIH Animal Center  
Ph: (b) (6)  
Fax 301-480-0644

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**From:** Kendall, Lon <(b) (6)>  
**Sent:** Thursday, September 19, 2019 11:55 AM  
**To:** Cisar, Alpie (NIH/OD/ORS) [E] <(b) (6)>  
**Cc:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Schountz, Tony  
<(b) (6)>  
**Subject:** miami bats

Alf,

If it help with decisions, we could possibly just receive females.

Lon

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523

Voice: (b) (6)

Cell: (b) (6)

Fax: 970-491-2496

(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Thu, 19 Sep 2019 15:52:49 -0600  
**To:** Plowright, Raina  
**Cc:** Schountz, Tony; LaTrielle, Sara  
**Subject:** Re: ACURO

ACURO submitted, now hoping that the caging will arrive soon and we are good to go

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

On 9/17/19, 6:25 AM, "Plowright, Raina" <[REDACTED]> (b) (6) wrote:

Hi Vincent,  
Do you want me to ask Amy to expedite your ACURO approval for bat experiments?  
Tony said he has enough bats right now.  
Raina

Sent from my iPhone



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Thu, 19 Sep 2019 09:08:55 -0600  
**To:** LaTrielle, Sara  
**Cc:** Plowright, Raina  
**Subject:** Check

Jus confirming that

D18AC00031

Is our DARPA grant number, planning to submit to ACURO today

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Wed, 18 Sep 2019 08:02:44 -0600  
**To:** Schountz, Tony  
**Subject:** Re: Immunology Monthly Meetings

That won't work from my end, its our departmental meeting

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Tuesday, September 17, 2019 at 8:10 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Fw: Immunology Monthly Meetings

Hi Vinnie,

It looks like Wednesdays from 9-10 AM MST is the only time available for everyone to meet. Will this work for you? Probably have the first meeting a week from tomorrow, then monthly thereafter.

Thanks,

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

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**From:** Schountz,Tony <[REDACTED] (b) (6)>  
**Sent:** Monday, September 16, 2019 9:32 AM  
**To:** Olivier Restif <[REDACTED] (b) (6)> Rynda-Apple, Agnieszka <[REDACTED] (b) (6)>  
Hector Aguilar-Carrero <[REDACTED] (b) (6)> [REDACTED] (b) (6) <[REDACTED] (b) (6)> Munster,  
Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> Caylee Falvo <[REDACTED] (b) (6)> Dan  
Crowley <[REDACTED] (b) (6)> Benson, Evelyn <[REDACTED] (b) (6)>  
**Cc:** Schountz,Tony <[REDACTED] (b) (6)> Plowright, Raina <[REDACTED] (b) (6)>  
**Subject:** Immunology Monthly Meetings

All, with the start of a new semester, I've set up a Doodle poll to identify a time when we can meet once per month for about an hour. I think I have everyone on the email list, but if not please forward this link to them. If you can get me your answers by Wednesday of this week I will get it scheduled. If you have ongoing biweekly or monthly events that conflict (for example, I have Faculty Council the first Tuesday of each month at 4:00 PM MST), let me know by email and I'll keep that in mind when finding a suitable day/time each month.

(b) (6)

Thanks,

Tony

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

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**From:** Olivier Restif <(b) (6)>  
**Date:** Monday, September 16, 2019 at 5:34 AM  
**To:** "Rynda-Apple, Agnieszka" <(b) (6)>  
**Cc:** Hector Aguilar-Carreno <(b) (6)> "Schountz, Tony"  
<(b) (6)> "Munster, Vincent (NIH/NIAID) [E]"  
<(b) (6)> ' <(b) (6)> <(b) (6)>  
**Subject:** Re: Monthly report

Hi Aga,

Has there been any update on scheduling calls? I'm including Elinor as she'll be the most closely involved in discussions and analyses.

Thanks,

Olivier

On 29 Aug 2019, at 18:11, Rynda-Apple, Agnieszka <(b) (6)> wrote:

This is a good thought- maybe more to discuss once or twice a month. Are there any days generally good for people?

---

Agnieszka Rynda-Apple, Ph.D.  
Assistant Professor  
Department of Microbiology & Immunology  
Montana State University  
Email: (b) (6)  
Phone: (b) (6)

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**From:** Hector Aguilar-Carreno <(b) (6)>  
**Date:** Thursday, August 29, 2019 at 9:46 AM  
**To:** "Rynda-Apple, Agnieszka" <(b) (6)> "Schountz, Tony"  
<(b) (6)> "Munster, Vincent (NIH/NIAID) [E]"  
<(b) (6)> Olivier Restif <(b) (6)>  
**Subject:** Re: Monthly report

Sorry, that time normally does not work for me. Fridays are generally quite tough for me, since my days are usually very full with meetings and seminars. Any other day that works for other people? Maybe we can do it once or twice a month instead of weekly?

Hector

Hector Aguilar-Carreno

Associate Professor

Microbiology and Immunology

College of Veterinary Medicine

Cornell University

Office: (607) 253-4029

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**From:** Rynda-Apple, Agnieszka <(b) (6)>  
**Sent:** Thursday, August 29, 2019 11:23:07 AM  
**To:** Schountz, Tony <(b) (6)> Hector Aguilar-Carreno <(b) (6)>  
Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Olivier Restif <(b) (6)>  
**Subject:** Re: Monthly report

Hi Tony,

We have nothing new since the VLP experiment I shared at the end of July. Dan and Evelyn have been in touch with Vincent's group and we should be getting the first set of samples for qPCR and BKA analysis in about two weeks.

Should we resuscitate our Immunology Team meetings for the Fall semester? Would Friday 11:30 am MST still work for everyone?

Aga

---

**From:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Date:** Thursday, August 29, 2019 at 6:46 AM  
**To:** Hector Aguilar-Carreno <[REDACTED] (b) (6)> "Rynda-Apple, Agnieszka"  
<[REDACTED] (b) (6)>  
**Subject:** Monthly report

Hi Aga and Hector,

Just checking in to see if you have anything for the monthly report. I'm still awaiting ACURO approval for my two protocols. It's been a few months since I submitted them. I'll ask Sarah if she can probe a bit to determine what's taking so long.

Thanks

Tony

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
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[REDACTED] (b) (6)

[REDACTED] (b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 17 Sep 2019 07:52:25 -0600  
**To:** Plowright, Raina  
**Cc:** Schountz, Tony; LaTrielle, Sara  
**Subject:** Re: ACURO

I think that's OK, although I could use someone to fill-out the ACURO documents as well.

Technically we are still waiting for appropriate level 4 caging as these bats are different than the Roussettus,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

On 9/17/19, 6:25 AM, "Plowright, Raina" <[REDACTED]> (b) (6) wrote:

Hi Vincent,  
Do you want me to ask Amy to expedite your ACURO approval for bat experiments?  
Tony said he has enough bats right now.  
Raina

Sent from my iPhone



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Mon, 16 Sep 2019 16:03:30 -0600  
**To:** Schountz, Tony  
**Subject:** Re: Paper for JID supplement

Think I'm almost through my original samples, so fingers crossed

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Monday, September 16, 2019 at 4:02 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Paper for JID supplement

Yes, we have aliquots of almost all of them. I screened them against H18 nucleoprotein and a large percentage of those from artibeus bats were positive by ELISA (something like 30-40%).

T.

---

Tony Schountz, PhD  
Associate Professor  
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Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

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**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Monday, September 16, 2019 at 3:59 PM  
**To:** "Schountz, Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Paper for JID supplement

Congrats, screening the remainder of the Trinidad bats for flu now,

We don't have any other samples left do we?

Vincent Munster, PhD

Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Monday, September 16, 2019 at 3:51 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Paper for JID supplement

You're welcome.

Just out today: <https://www.nature.com/articles/s41564-019-0556-9>

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Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Monday, September 16, 2019 at 3:50 PM  
**To:** "Schountz,Tony" <[REDACTED] (b) (6)>  
**Subject:** Re: Paper for JID supplement

Thanks buddy!

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Monday, September 16, 2019 at 3:24 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Subject:** Re: Paper for JID supplement

Vinnie, it looks very nice – thanks much.



I've made a few suggestions for you to consider.

Thanks,

Tony

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)  
(b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>

**Date:** Monday, September 16, 2019 at 2:32 PM

**To:** Janine Seetahal <(b) (6)> Vernie Ramkissoon

<(b) (6)> "Anthony, Simon J." <(b) (6)> Eric

Laing <(b) (6)> "Broder, Chris (USU-DoD)" <(b) (6)>

Christine Carrington <(b) (6)> "Schountz,Tony"

<(b) (6)> " (b) (6) <(b) (6)>

**Subject:** Paper for JID supplement

Dear co-authors,

Please find attached for review the manuscript on Henipavirus and filovirus screening of our Trinidad bat cohort.

Paper is pretty straight forward, no PCR positives (and a bit supplemental info on an updated pan-filo assay) but a couple of henipa and filo virus serological hits (but nothing could be confirmed).

Simon: can you send this to Alexander?

Eric: can you send this to Spencer and Lianying?

Christine: can you send this to Jerome?

Given that this is a very straightforward paper and I'm up to an end of this month deadline for JID submission, I would like to submit by the end of next week. Please also fill out the COI form, or reply to me whether you have conflicts of interest.

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Mon, 16 Sep 2019 14:31:17 -0600  
**To:** Janine Seetahal; Vernie Ramkissoon; Anthony, Simon J.; Eric Laing; Broder, Chris (USU-DoD); Christine Carrington; Schountz, Tony; (b) (6)  
**Subject:** Paper for JID supplement  
**Attachments:** Supporting Information.docx, Figure 2.tif, Figure1.tiff, Serological evidence for Filovirus 091619.docx, coi\_disclosureTrinidad.pdf

Dear co-authors,

Please find attached for review the manuscript on Henipavirus and filovirus screening of our Trinidad bat cohort.

Paper is pretty straight forward, no PCR positives (and a bit supplemental info on an updated pan-filo assay) but a couple of henipa and filo virus serological hits (but nothing could be confirmed).

Simon: can you send this to Alexander?

Eric: can you send this to Spencer and Lianying?

Christine: can you send this to Jerome?

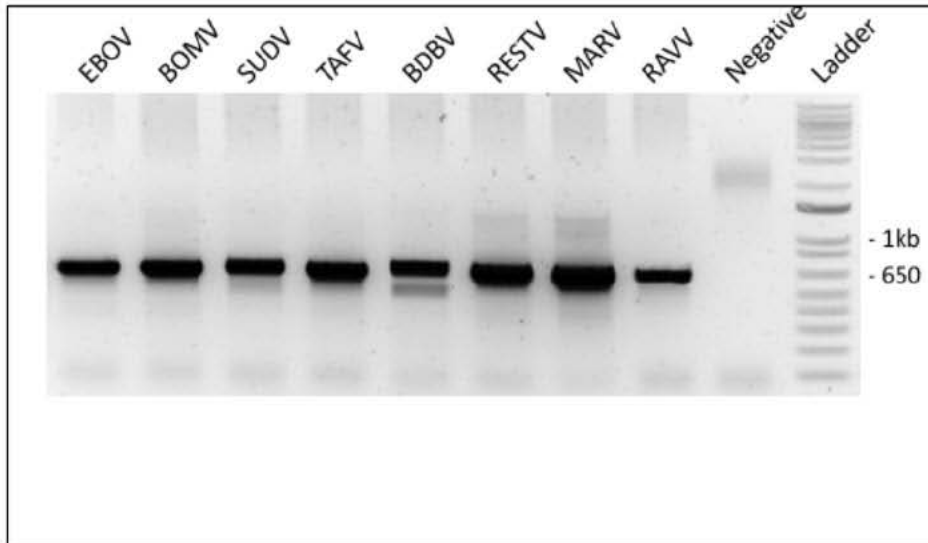
Given that this is a very straightforward paper and I'm up to an end of this month deadline for JID submission, I would like to submit by the end of next week. Please also fill out the COI form, or reply to me whether you have conflicts of interest.

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

## Supporting Information

**Supplementary Figure 1. Representative filovirus amplicons visualized by gel electrophoresis after pan-filovirus RT-PCR.** PCR products were loaded onto a 1% agarose gel. Seven representative stock filoviruses diluted  $10^{-2}$ .



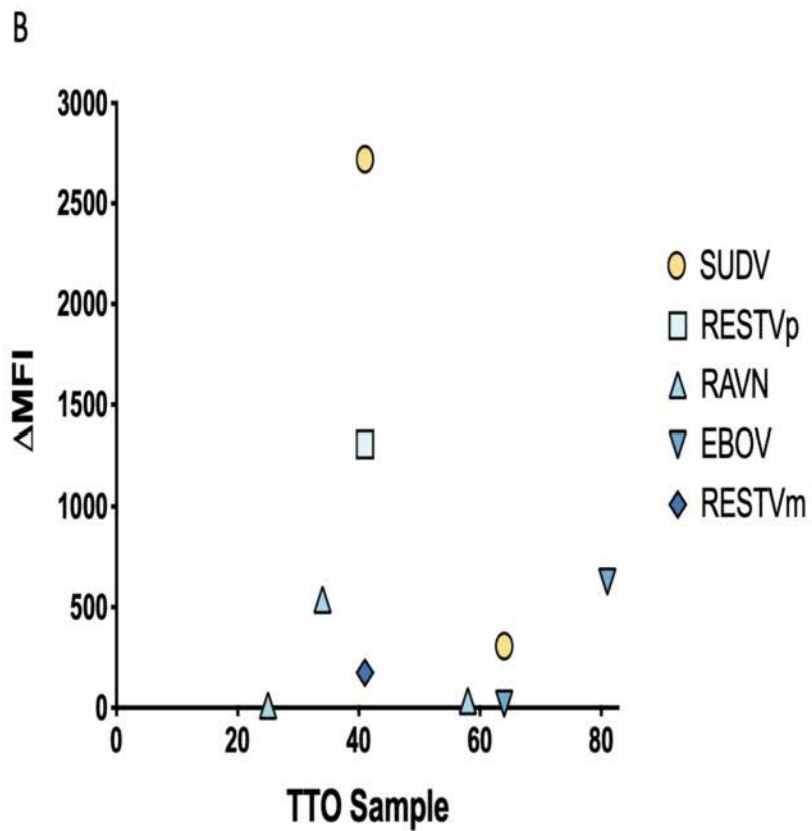
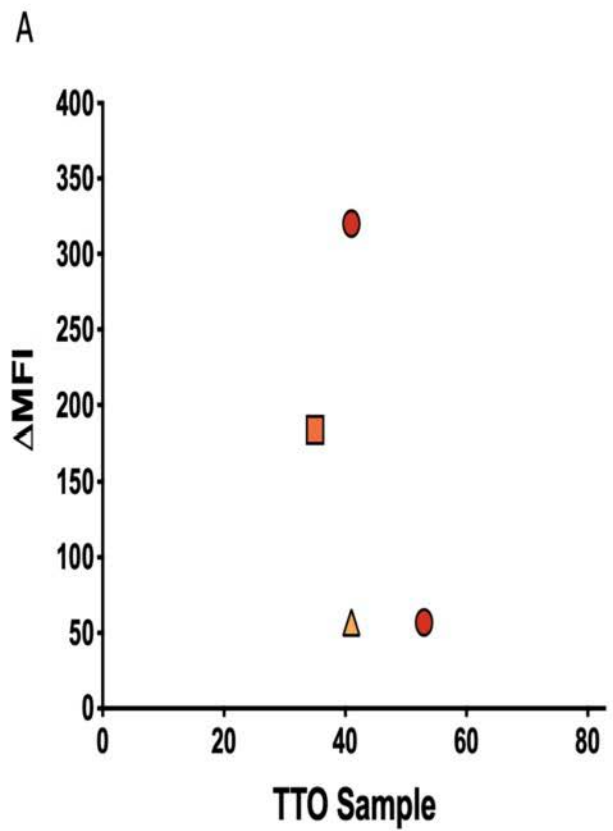
**Supplementary Table 1. Primers and probes used for ddPCR**

Virus	Target	Primer/Probe	Sequence
EBOV	L	EBOV-F	CAGCCAGCAATTTCTTCCAT
		EBOV-R	TTTTCGGTTGCTGTTTCTGTG
		EBOV-P	FAM-ATCATTGGC/ZEN/RTACTGGAGGAGCAG-3IABkFQ
SUDV	GP	SUDV-F	AAAGGGAAGAATCTCCGACC
		SUDV-R	CAGGGGAATSCTTTGGAAACC
		SUDV-P	FAM-GGCCACCAGGAAGTATTCGGACCT
TAFV	L	TAFV-F	CGCGATGTATCTCCCAATATCA
		TAFV-R	AGTACAATTCTGTGCGAGACTAA
		TAFV-P	FAM-TAGAACCCTCATTGGCAGAAGGGC
RESTV	L	RESTV-F	RGAAGCRAGAGTCAACCTTAG
		RESTV-R	CGGGCTRTATTGGTCGTTAT
		RESTV-P	FAM-TCARYGAAGTCCTRCAAATGACACCA-ZEN/3IABkFQ
BDBV	NP	BDBV-F	RAATGARATCAGCTTCCAGCA
		BDBV-R1	GAGCTTGGCTAGCCTTTCCT

		BDBV-R2	GTCAATTTGGCCAATCTCTCTT
		BDBV-P	FAM-ACRACAGCCATGGTCACACTRCGGA
MARV	L	MARV-F1	GCAAAAGCATTCCCTAGTAACATGA
		MARV-F2	GCGAAGGCATTCCCTAGTAATATGA
		MARV-R1	CACCCCTCACTATRGCCTTYTC
		MARV-R2	CACCTTACTATGGCATTCTC
		MARV-P	FAM-TGGCACCAYAATTCAGCAAGCATAGG-ZEN/3IABkFQ
RAVV	L	RAVV-F	AGGGTCACGAACAGAAGATAAA
		RAVV-R	TGCCTTGAGTCACCCACAAT
		RAVV-P	FAM-CCATCGGCAGCCCTTAAAGAAGCTA-ZEN/3IABkFQ
BOMV	L	Filo_UCD_qFor	TCTCGACGAAGGTCATTAGCGA
		Filo_UCD_qRev	TTGCTCTGGTACTCGCTTGGT
		Filo_UCD_probe	FAM-TGCTGGGATGCTGTCTTTGAGCCT-BHQ

**Supplementary Table 2. Representative filoviruses LOD**

Virus	Accession no.	LOD (copies/ $\mu$ L)
BOMV	MF319185	1.0
EBOV Gabon	KC242792	3.1
SUDV Boniface	KT750754	0.5
TAFV	KU182910	1.5
BDBV	FJ217161	1.0
RESTV Pennsylvania	KY798004	0.3
MARV Angola	KY047763	0.3
RAVV	KU179482	4.4



Area Enlarged

South  
America

N

500mi.

<u>Bats</u>	<u>Field Sites</u>
27	● Mount Hope
27	● Lopinot
16	● Santa Cruz
5	● Maracas Valley

Maracas  
Valley

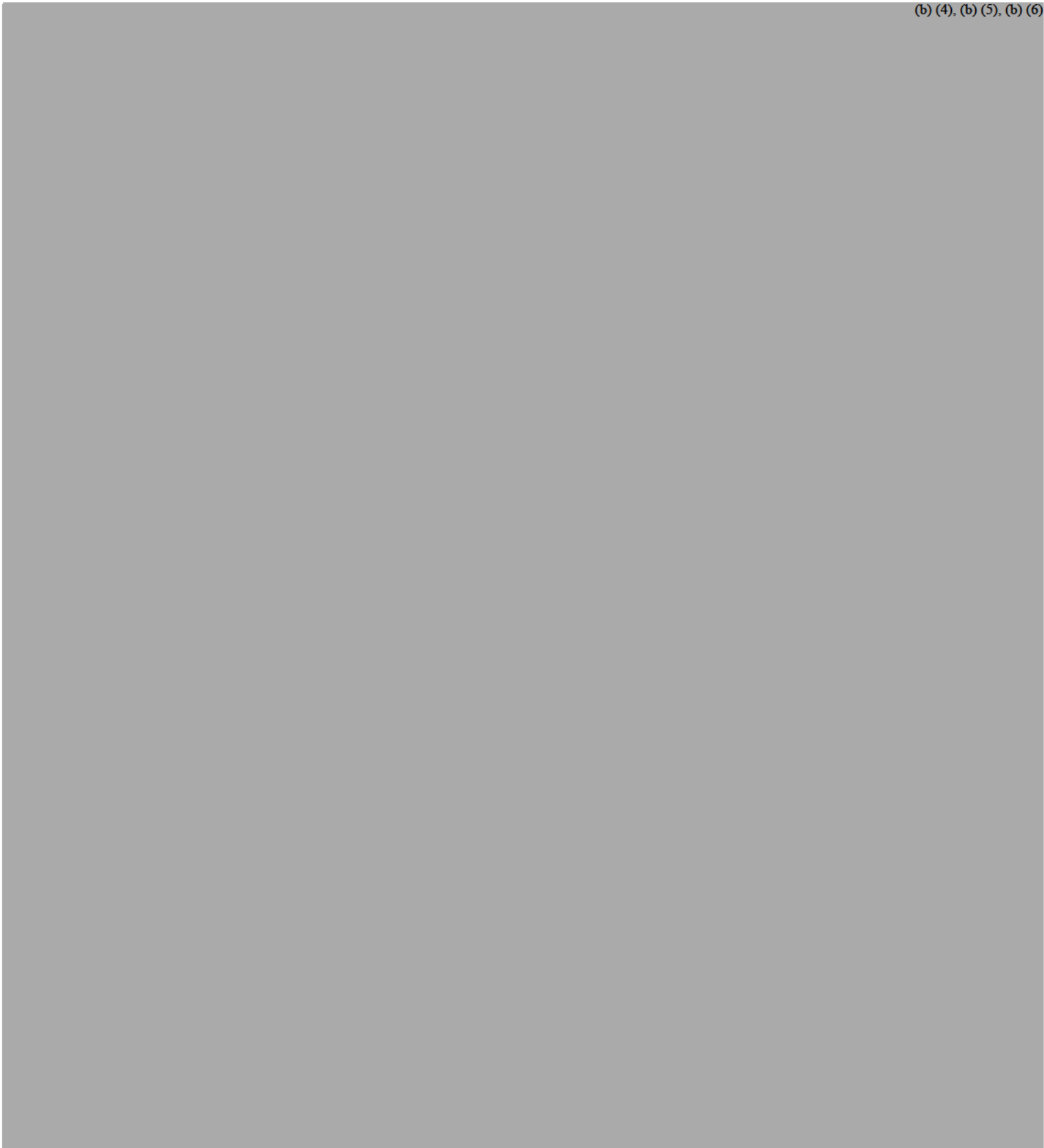
Santa Cruz

Lopinot

Mount Hope

Trinidad

10mi.

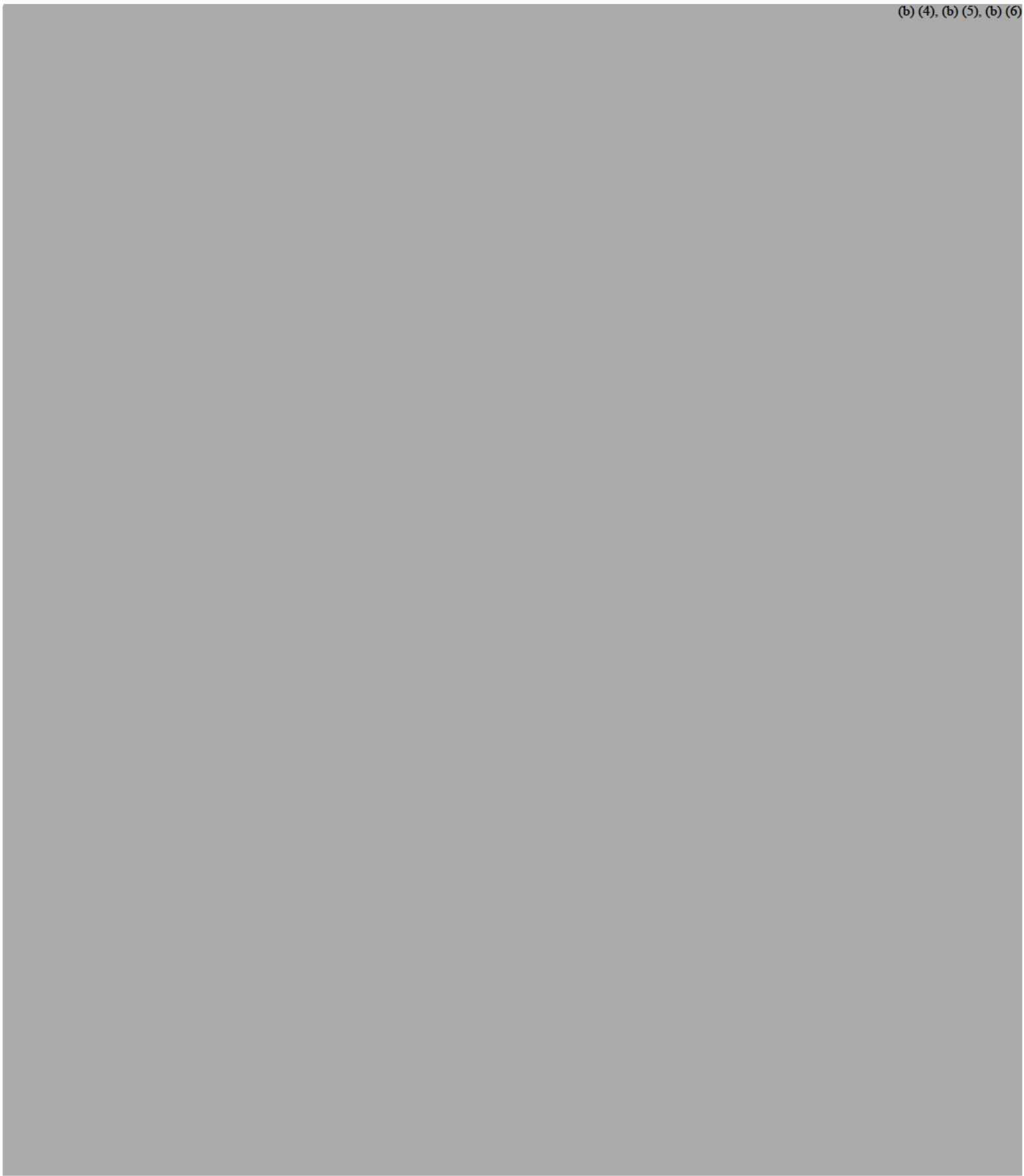


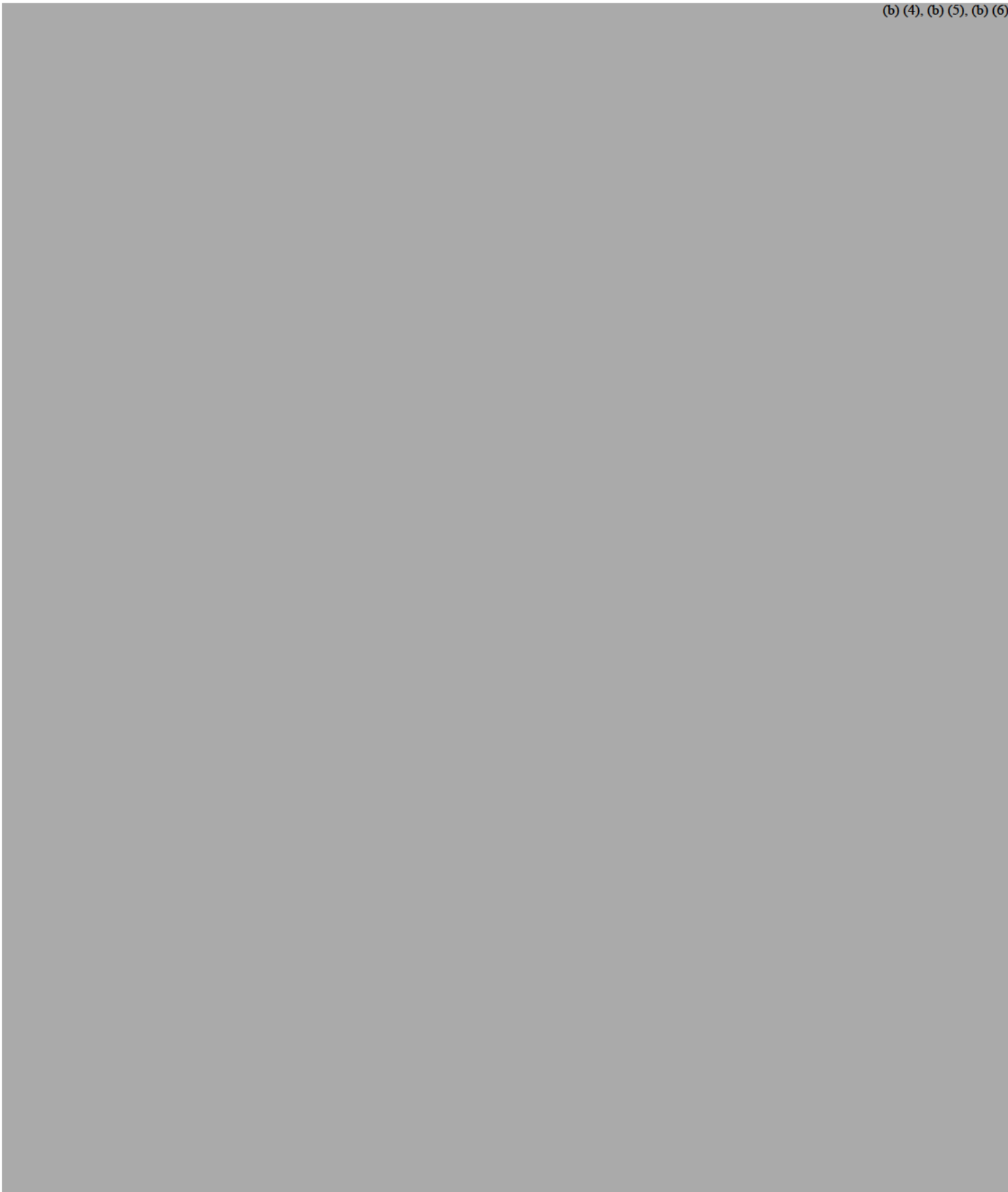






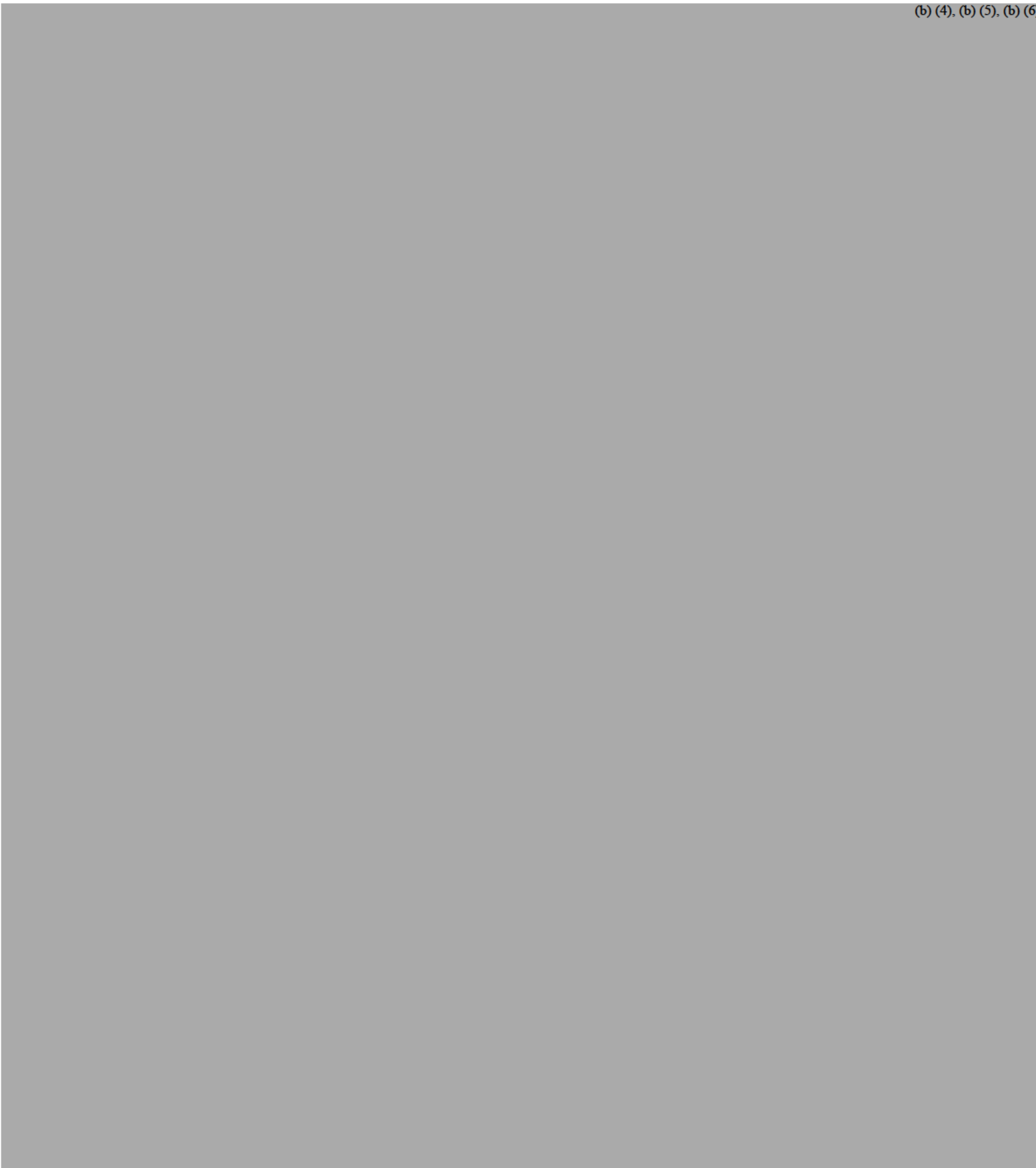








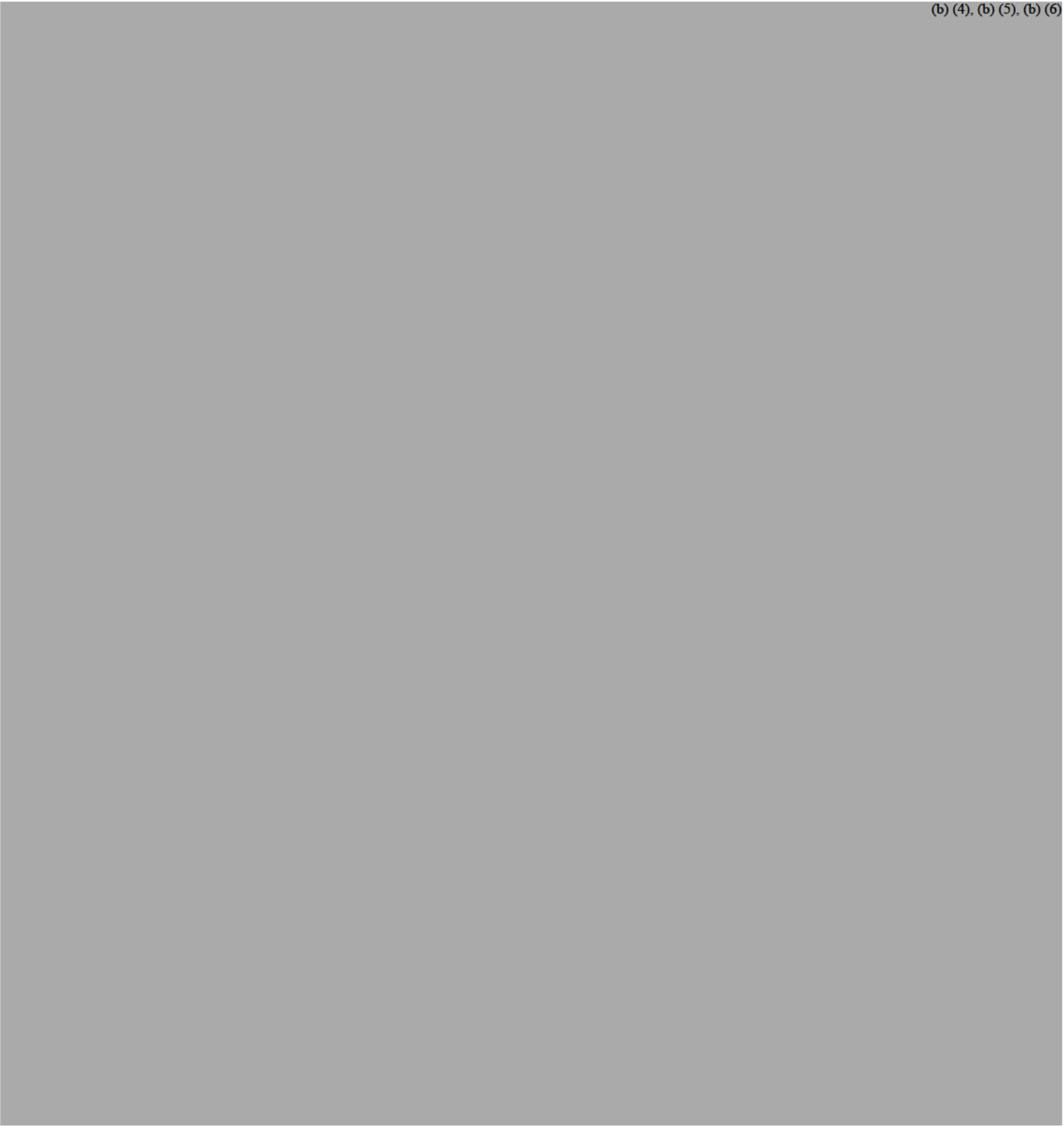




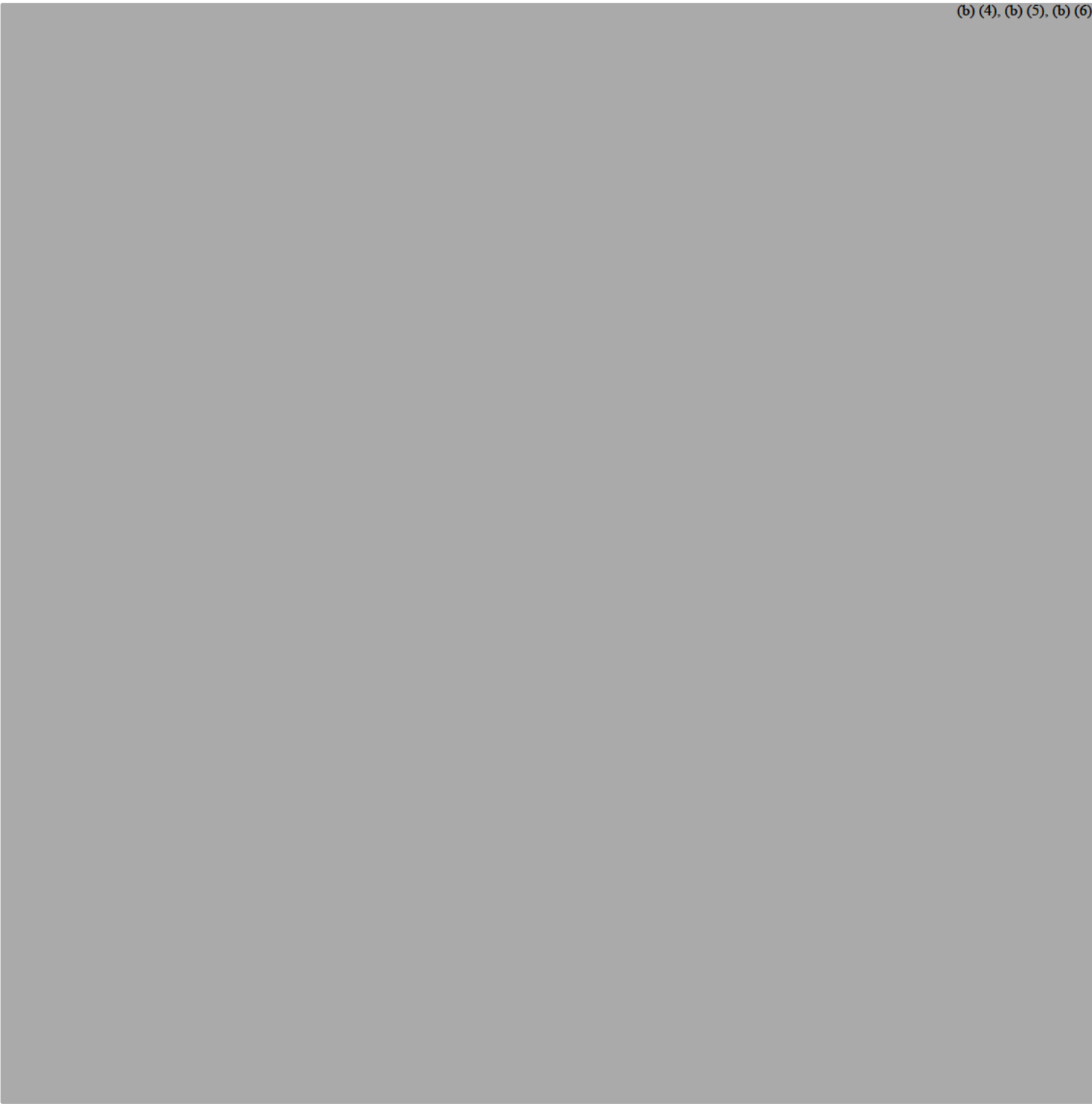


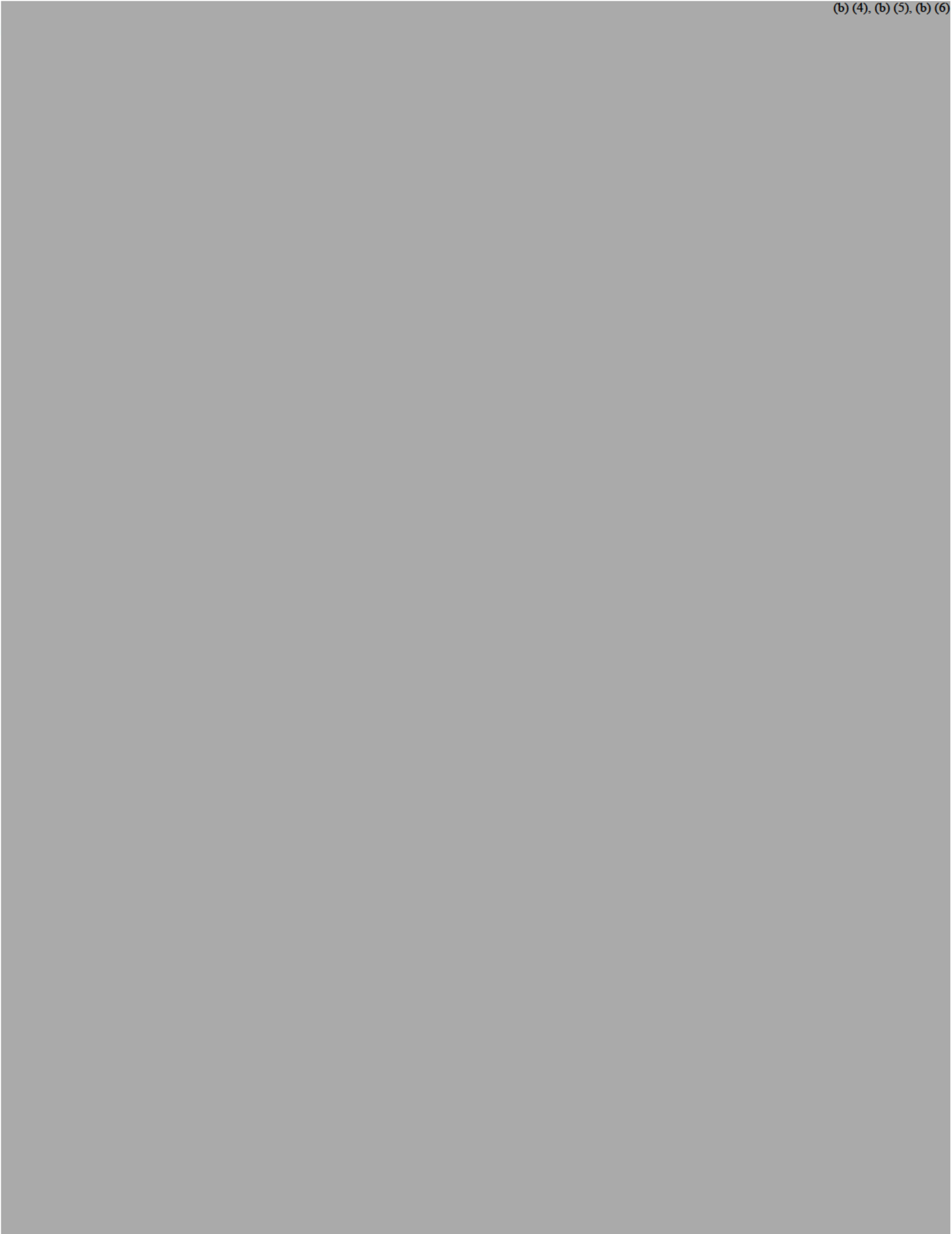




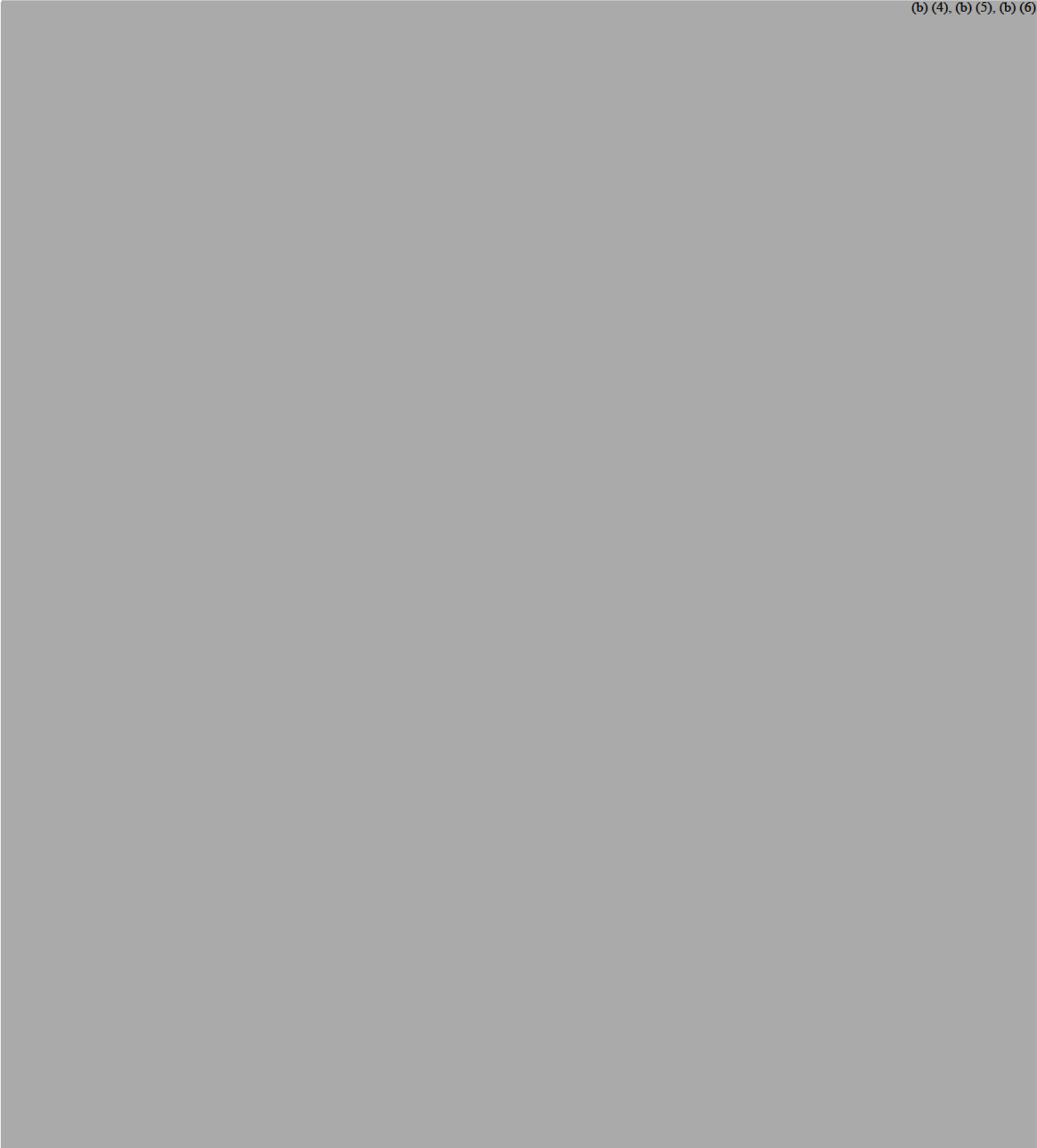
















**From:** Plowright, Raina  
**Sent:** Mon, 16 Sep 2019 20:25:52 +0000  
**To:** Letko, Michael (NIH/NIAID) [F]  
**Cc:** Kevin Olival; Munster, Vincent (NIH/NIAID) [E]; Seifert, Stephanie (NIH/NIAID) [F]  
**Subject:** Re: Nature Reviews Microbiology manuscript draft  
**Attachments:** NRM DRAFT 8\_27\_19\_RP.docx

Here it is. Great paper — it will be a useful addition!  
I'm happy to do more on the intro and conclusion (if you decide to do a separate conclusion, which I support!) and abstract. (b) (6) just set in so best to hand it to Kevin now and I'll let Michael send me the next version for more help on those summary sections. If you catch me as I (b) (6) time I can get edits back quickly so you can meet the nrmicro deadline.  
Thanks again for including me.  
Raina

On Sep 16, 2019, at 7:56 PM, Plowright, Raina <(b) (6)> wrote:

Ha! (b) (6) working on this right now. I'm behind on schedule bc of a flaw in my plan... leaving for a meeting with no talk written. Hope to get this to you later today or tomorrow.

Sent from my iPhone

On Sep 16, 2019, at 7:38 PM, Letko, Michael (NIH/NIAID) [F] <(b) (6)> wrote:

Hi Kevin,

Sounds good. Thanks for the update!

-michael

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)  
(b) (6)

---

**From:** Kevin Olival <[REDACTED] (b) (6)>  
**Date:** Sunday, September 15, 2019 at 12:30 AM  
**To:** "Letko, Michael (NIH/NIAID) [F]" <[REDACTED] (b) (6)>  
**Cc:** "Plowright, Raina" <[REDACTED] (b) (6)> "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <[REDACTED] (b) (6)>  
**Subject:** Re: Nature Reviews Microbiology manuscript draft

Micheael,

I've been coordinating w Raina. She should finish her edits on Sunday, and I'll pick it up and edit at that point. We thought it would make sense to do this sequentially. I have [REDACTED] (b) (6) so will try to work on this enroute, otherwise should be able to carve out some time while at my next meeting next week.

Cheers,  
Kevin

On Sep 10, 2019, at 12:28 AM, Letko, Michael (NIH/NIAID) [F] <[REDACTED] (b) (6)> wrote:

Hi Raina,

The editor said we are limited to "about 140 references." So we have room to add more.

Cheers,  
-michael

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)  
[REDACTED] (b) (6)

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Monday, September 9, 2019 at 10:05 AM  
**To:** "Letko, Michael (NIH/NIAID) [F]" <[REDACTED] (b) (6)>  
**Cc:** Kevin Olival <[REDACTED] (b) (6)> "Munster, Vincent (NIH/NIAID) [E]" <[REDACTED] (b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <[REDACTED] (b) (6)>  
**Subject:** Re: Nature Reviews Microbiology manuscript draft

Hi Michael,

Do you have a reference limit, and if so, are you at the limit?

It will help me to know if I should suggest 3 or 4 refs for some concepts or just choose a single best pick.

Raina

On Aug 27, 2019, at 2:11 PM, Letko, Michael (NIH/NIAID) [F] <[REDACTED]> wrote:

Dear co-authors,

Attached is our draft of the bat-virus manuscript for Nature Reviews Microbiology. Please take a look at the manuscript and make changes wherever you see fit. If you want to include any references, just paste the PMID where you want and we will add them in through EndNote.

Ideally, we would like to submit the finalized manuscript to the editors sometime in the 3<sup>rd</sup> or 4<sup>th</sup> week of September (around 16<sup>th</sup>-27<sup>th</sup>).

**In general, our review briefs through several contemporary areas of bat-virus research, then highlights the knowledge gaps in those areas and poses ways to address them.** This larger scope and forward-thinking perspective is where our review is different from other bat-virus reviews. There are 3 sections:

- a. Lines 20-41: **Ecology section/box** (the editors suggested we keep it shorter but it could still use some expansion)
- b. Lines 47-273 **Molecular section** (species barriers and immunity)
  - a. With a figure of the types of cellular species barriers viruses must overcome
  - b. followed by a **box on bat-animal models** (lines 278-290)
- c. Lines 301-422: **Virus surveillance and one health section**
  - a. With a figure on the future of virus discovery
  - b. Followed by a **box on the future of bat virus research** (lines 428-459)
    - i. Alternatively, we can form this box into a conclusion paragraph, which also fits

**In general, the current manuscript will benefit from the following:**

1. Preferably from the senior authors (Kevin, Raina, Vincent): broad-strokes statements in the introduction and conclusion, to help contextualize within the field.
2. More bat-virus-specific examples, where necessary
3. Transition statements to help link core concepts
4. Additional figures if you can think of any. We have 2 right now and 2 or 3 boxes, but most of the editor's ideas did not make sense (like a phylogenetic tree of all viruses) or have been done a thousand times over by every other review (factors influencing spillover).

Let us know if you have any questions or issues. It has been a team effort and we are excited to finally close in on submitting this review!

We look forward to your additions and changes!

Best,  
-michael

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)  
(b) (6)

<NRM DRAFT 8\_27\_19.docx>

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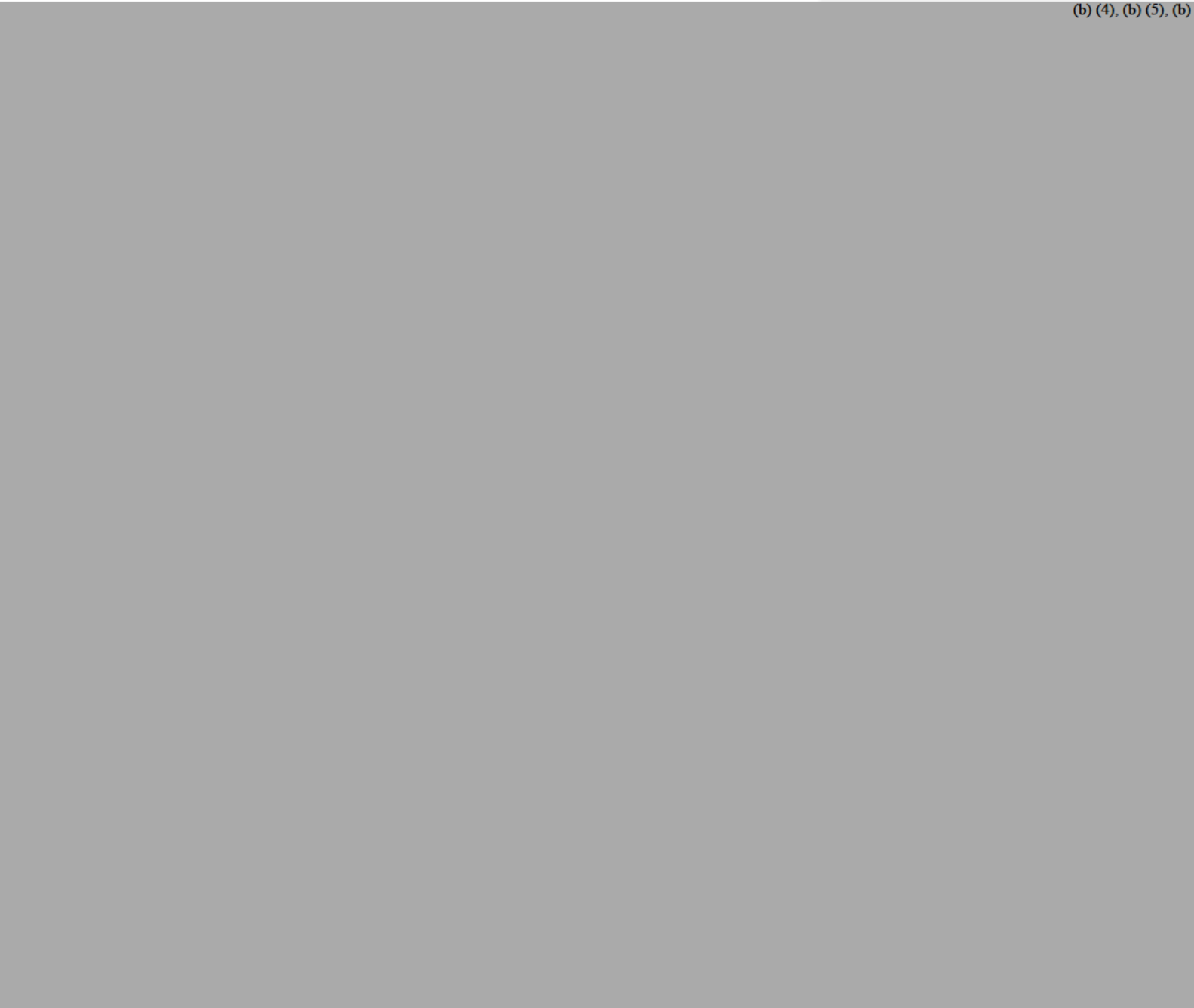
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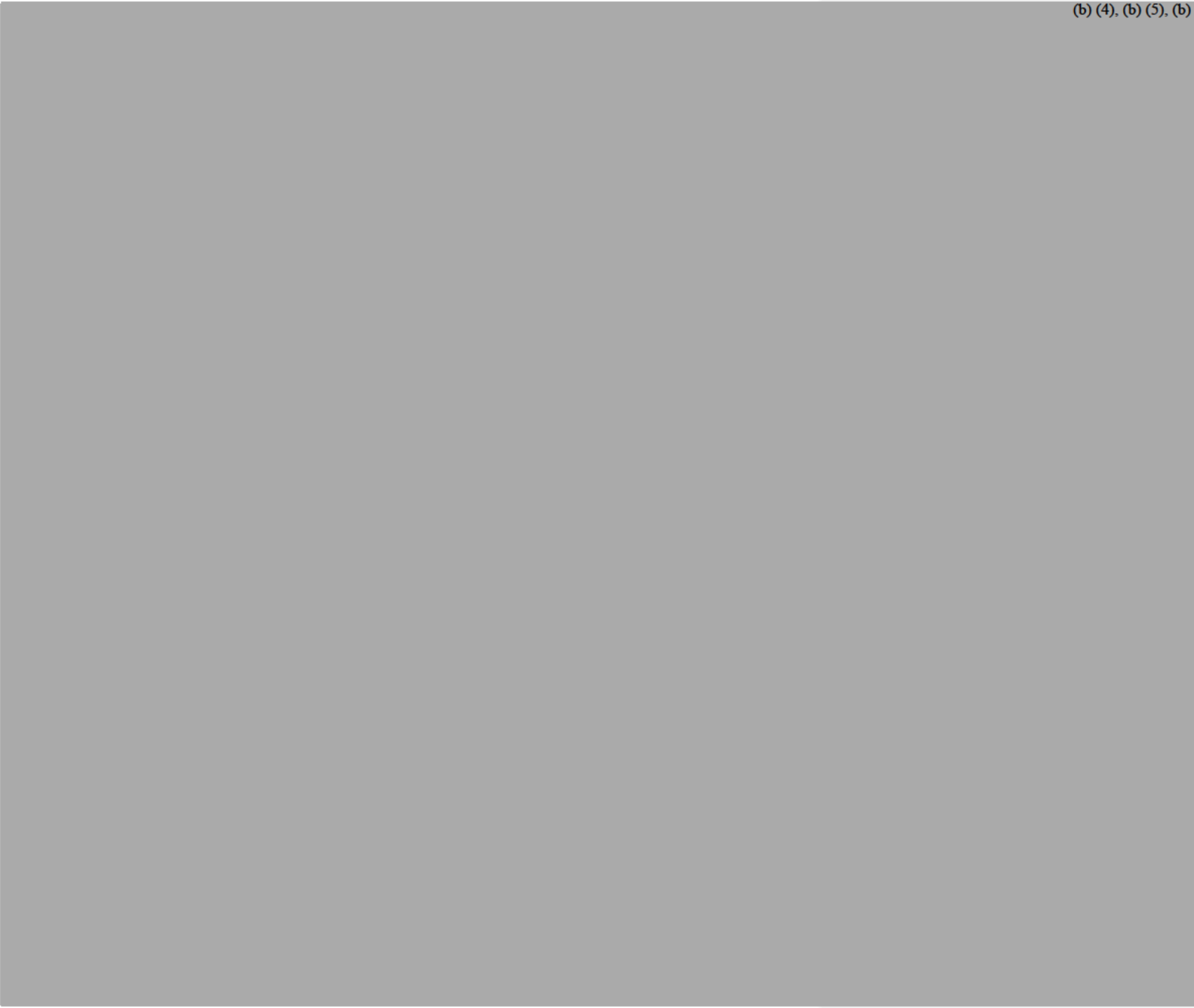
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(b) (4), (b) (5), (b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Mon, 16 Sep 2019 12:28:43 -0600  
**To:** Plowright, Raina  
**Cc:** Bushmaker, Trenton (NIH/NIAID) [E]  
**Subject:** Re: Superscript IV

The second would probably be best, the NIH is rather typical when it comes to ordering.

No rush btw

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Monday, September 16, 2019 at 11:31 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** Trenton Bushmaker <[REDACTED] (b) (6)>  
**Subject:** Re: Superscript IV

It's a great idea. Can you guys order and we give the credit card number or do you need us to order and have shipped to you?

Sent from my iPhone

On Sep 16, 2019, at 6:59 PM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

Hi Raina,

As discussed for the remaining budget of the CNH grant we would like \$10,000 of SSIV. This will largely be used for the conversion of samples for Ali, so she can do the screening for co-circulation of other paramyxos.

Typically it is best to ask Thermo Fischer for a quote when spending amounts like that.

Let me know what you think,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section

Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Sat, 14 Sep 2019 10:10:10 -0600  
**To:** LaTrielle, Sara; Raina Plowright; Plowright, Raina  
**Subject:** Re: D18AC00031\_ MSU August Monthly report

Lol, figured out the discrepancy between the slide ordering, I was still using my own pre, rather than the master file created by Sara.

Btw, feel free to share on slack,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "LaTrielle, Sara" <(b) (6)>  
**Date:** Thursday, September 12, 2019 at 8:28 PM  
**To:** (b) (6), (b) (6)  
(b) (6)  
**Cc:** (b) (6), (b) (6)  
(b) (6), "  
" (b) (6), (b) (6)  
(b) (6), "  
(b) (6), "Hudson, Peter John"  
<(b) (6) "Plowright, Raina" <(b) (6)>  
**Subject:** Re: D18AC00031\_ MSU August Monthly report

Amy and Team,

Please use this updated version for our Aug 2019 monthly update.

Vincent Munster with Rocky Mountain Lab will present our project's TA2 vaccine approach and update which will be followed by an overall technical update of the project by Raina.

Best,

Sara LaTrielle

Program Manager  
PREEMPT Project  
Montana State University

(b) (6)

---

**From:** LaTrielle, Sara

**Sent:** Thursday, September 12, 2019 3:33 PM

**To:** (b) (6); (b) (6)

**Cc:** Plowright, Raina <(b) (6)> Hudson, Peter John <(b) (6) (b) (6)>

(b) (6); (b) (6)

(b) (6); (b) (6)

(b) (6); (b) (6)

(b) (6)

**Subject:** D18AC00031\_ MSU August Monthly report

Amy,

Please find MSU's August 2019 monthly report attached. We look forward to our monthly call with you and your team tomorrow. We will have an additional slide with new results, but I wanted to make sure you got this slide deck so you could review in advance, if you wanted.

Best,

Sara LaTrielle

Program Manager  
PREEMPT Project  
Montana State University

(b) (6)

Sara LaTrielle

Program Manager  
PREEMPT Project  
Montana State University

(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Sat, 14 Sep 2019 09:59:07 -0600  
**To:** Schountz, Tony; Eric Laing  
**Cc:** van Doremalen, Neeltje (NIH/NIAID) [E]  
**Subject:** Re: qPCR array results

Looks pretty good,

You might want to ask Eric to make Cedar / nipah chimera's with Cedar C and W

<https://www.ncbi.nlm.nih.gov/pubmed/27147733>

that should be interesting on the celllines to, I'm pretty sure we tested MERS on the AJs, btw we have immortalized AJs too, so you might want to think about taking these along to see whether they still respond the same.

All in all pretty cool,

We have standards for Nipah, both viral RNA and run-of transcripts

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Saturday, September 14, 2019 at 8:20 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** Neeltje van Doremalen <[REDACTED] (b) (6)> Tony Schountz <[REDACTED] (b) (6)>  
**Subject:** Re: qPCR array results

Vinnie, I have attached a PDF of the data. The photos (A) were taken by Neeltje and she extracted the RNAs and sent them to us. We don't have standards for NiV or HeV so I've only shown the Ct values for vRNA in the supernatants (B). Probably needed to wash the wells twice instead of once (red and blue lines). My student Juliette did the USU Cedar virus with the same cells here at CSU. She also inadvertently deleted the 24 hour Cedar data in panel C so those are all set to 1 (i.e., "unchanged"). We don't have enough RNA to repeat the qPCR array but she is repeating the infection experiment with the USU Cedar virus (that Eric Liang made) here at CSU. Not a clean data set, but I think it's clear we should repeat it with the other Aj epithelial cells we've established and clean up the experiment. We will be testing all 7 of them in the coming weeks for susceptibility to Cedar (and MERS-CoV).

T.

—



Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)  
(b) (6)

---

From: **Munster, Vincent (NIH/NIAID) [E]** <(b) (6)>  
Date: Thu, Sep 12, 2019 at 12:25 PM  
Subject: Re: qPCR array results  
To: Tony Schountz <(b) (6)> van Doremalen, Neeltje (NIH/NIAID) [E]  
(b) (6)

That's exciting, so good replication on the AJs

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

On 9/10/19, 4:34 PM, "Tony Schountz" <(b) (6)> wrote:

Hi Neeltje and Vinnie,

A quick update on the infections we did in July at your place.

My student (b) (6) has a 46 gene SYBR green array for antiviral genes for Aj cells working. As no surprise, the expression of more than half of these genes are elevated, some more than 1000 fold, in response to Cedar but nearly all are off or repressed with Nipah and Hendra. Her PCR for the viruses also confirms they replicate but strangely Cedar appeared to parallel Nipah. It's probably difficult to assess what this means, though. So I think the pilot experiment was a good success.

We now have primary kidney epithelial cells from 4 male and 3 female Aj bats so we should have a strong set of biological replicates for future work.

(b) (6) is going to present a poster at the Pingree Park meeting next month and I'll send the abstract to you early next week.

Thanks

T.

Sent from my iPhone

**From:** Schountz, Tony  
**Sent:** Sat, 14 Sep 2019 14:19:38 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Cc:** van Doremalen, Neeltje (NIH/NIAID) [E]; Schountz, Tony  
**Subject:** Re: qPCR array results  
**Attachments:** Pilot Aj Henipavirus.pdf

Vinnie, I have attached a PDF of the data. The photos (A) were taken by Neeltje and she extracted the RNAs and sent them to us. We don't have standards for NiV or HeV so I've only shown the Ct values for vRNA in the supernatants (B). Probably needed to wash the wells twice instead of once (red and blue lines). My student (b) (6) did the USU Cedar virus with the same cells here at CSU. She also inadvertently deleted the 24 hour Cedar data in panel C so those are all set to 1 (i.e., "unchanged"). We don't have enough RNA to repeat the qPCR array but she is repeating the infection experiment with the USU Cedar virus (that Eric Liang made) here at CSU. Not a clean data set, but I think it's clear we should repeat it with the other Aj epithelial cells we've established and clean up the experiment. We will be testing all 7 of them in the coming weeks for susceptibility to Cedar (and MERS-CoV).

T.

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

From: **Munster, Vincent (NIH/NIAID) [E]** <(b) (6)>  
Date: Thu, Sep 12, 2019 at 12:25 PM  
Subject: Re: qPCR array results  
To: Tony Schountz <(b) (6)> van Doremalen, Neeltje (NIH/NIAID) [E]  
(b) (6)

That's exciting, so good replication on the AJs

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

On 9/10/19, 4:34 PM, "Tony Schountz" <(b) (6)> wrote:

Hi Neeltje and Vinnie,

A quick update on the infections we did in July at your place.

My student (b) (6) has a 46 gene SYBR green array for antiviral genes for Aj cells working. As no surprise, the expression of more than half of these genes are elevated, some more than 1000 fold, in response to Cedar but nearly all are off or repressed with Nipah and Hendra. Her PCR for the viruses also confirms they replicate but strangely Cedar appeared to parallel Nipah. It's probably difficult to assess what this means, though. So I think the pilot experiment was a good success.

We now have primary kidney epithelial cells from 4 male and 3 female Aj bats so we should have a strong set of biological replicates for future work.

(b) (6) is going to present a poster at the Pingree Park meeting next month and I'll send the abstract to you early next week.

Thanks

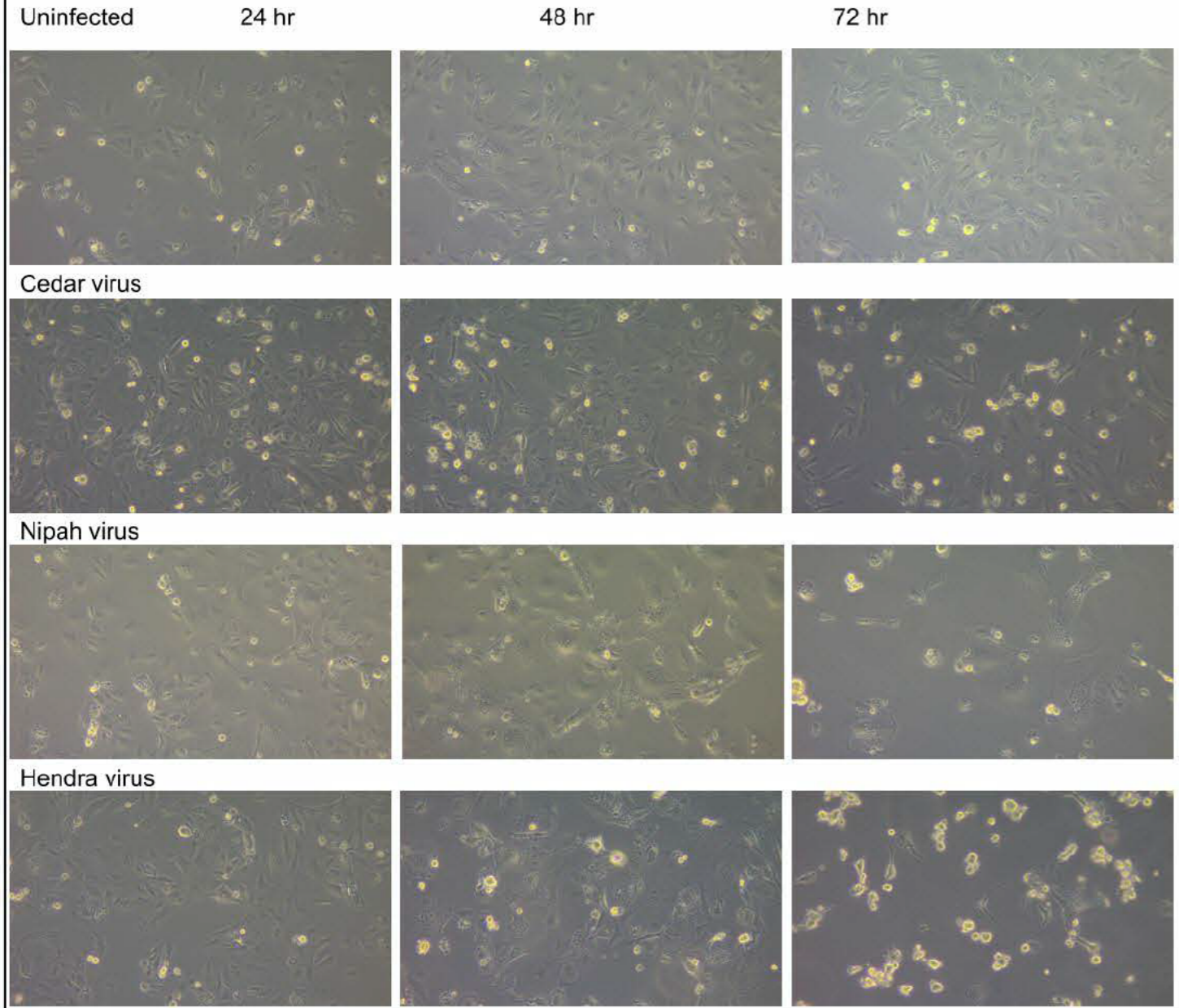
T.

Sent from my iPhone

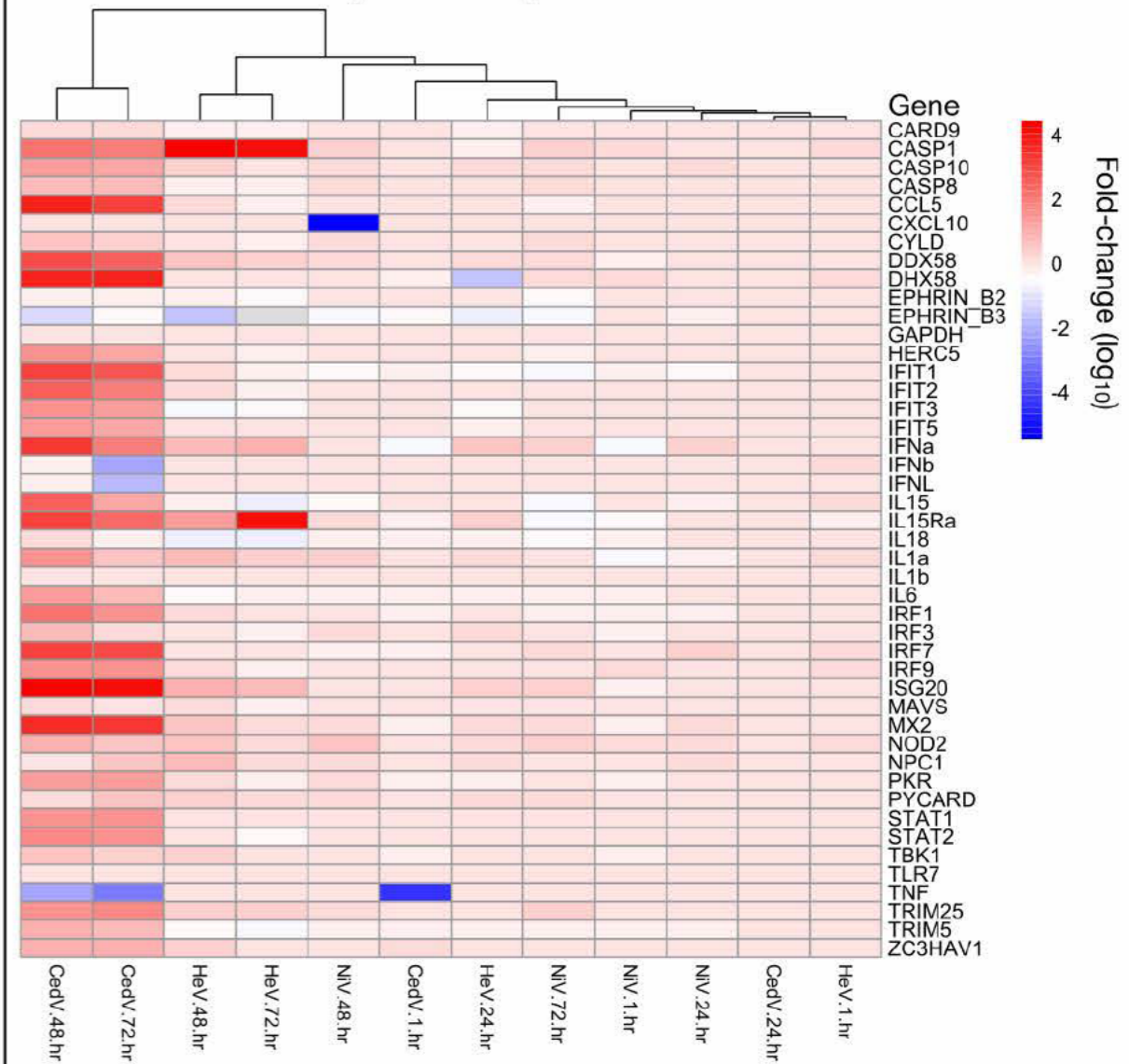


# Henipaviruses infect Jamaican fruit bat kidney epithelial cells

**A** Time course. Cells were inoculated with 0.1 MOI for 30 min (media only for uninfected cells), washed once and then cultured with 2% FBS-DMEM for the noted hours. MOI = 0.1.

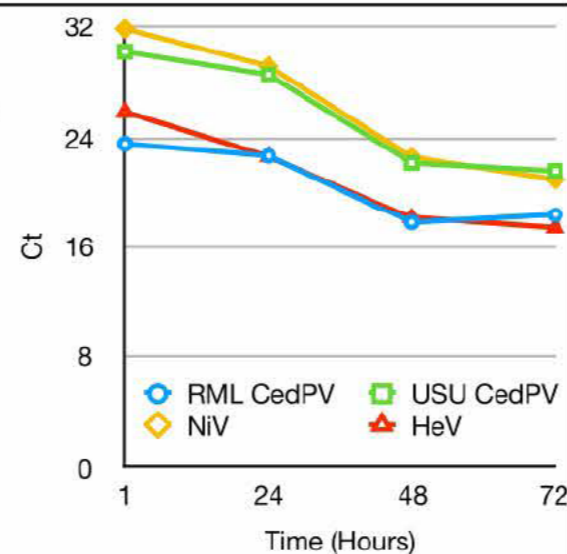


**B** Examination of mRNA expression by qPCR array shows that the bat epithelial cells mount a robust antiviral response to Cedar virus but Nipah or Hendra viruses repress the response.



Total RNA was extracted from the cells, reverse transcribed and subjected to SYBR Green qPCR to assess abundance of expression relative to the uninfected cells ( $\Delta\Delta C_t$ ). Fold-change was log<sub>10</sub> transformed and clustered heat map generated with pheatmap within R statistical software.

**C** Replication kinetics. RNA extracted from supernatants. Probe-based qPCR.



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Thu, 12 Sep 2019 14:30:46 -0600  
**To:** LaTrielle, Sara  
**Cc:** Plowright, Raina  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?  
**Attachments:** DARPA PREEMPT.pptx

Hey guys,

Find attached the presentation for tomorrow,

There still will be some additional slides (under construction), but this will be the main body

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "LaTrielle, Sara" <(b) (6)>  
**Date:** Monday, September 9, 2019 at 11:29 AM  
**To:** '(b) (6) <(b) (6)>  
**Cc:** "Plowright, Raina" <(b) (6)>  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Vincent,

Will you have slides to present to DARPA? If so, can you please send these to me by COB Wednesday that would be best, but I see you are away so it is possible to get these from you Thursday till noon and still be able to incorporate at the last minute. DARPA requests all slides be sent at least 24-48 hours in advance. Thanks.

I just forwarded the meeting invite for this Friday to you, from DARPA/Monica. Call-in details are there.

Sara

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Friday, September 6, 2019 2:31 PM  
**To:** Plowright, Raina <(b) (6)>  
**Cc:** LaTrielle, Sara <(b) (6)>  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Travelling until Wednesday, so give me a holler on Thursday. Tomorrow would work too,



For Jamie's work I thought he was primarily dealing with Hector? I know he is frustrated, but there is not that much from my end I can do about this (more a capacity problem as we are dealing with bsl4 stuff). I kind of relied on him/amandine to at least come-up with a plan/reagents to do some basic testing here at RML but need somebody who is pulling that (e.g. finding the appropriate cellines etc.)

For the screening we are on track, sequencing is on its way so hopefully we will be able to feed some into the modelling. One caveat is that the bats are shedding relatively little, so not that good for sequencing. The first screens for pan-paramyxo's has started as well so hopefully we'll find smtg novel soon.

In hindsight, some of the TA1s might be a bit ambitious given their reliance on the screens, but that's all hindsight. Ther CNH grant should be well in. tack so hopefully we'll have that screening finished soon-ish).

Btw, I think it is going quite well, there will always be parts which will not work-out.

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <[redacted] (b) (6)>

**Date:** Thursday, September 5, 2019 at 4:58 PM

**To:** '[redacted] (b) (6) <[redacted] (b) (6)>

**Cc:** "LaTrielle, Sara" <[redacted] (b) (6)>

**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Here are the metrics.... Lots to chat about with other things so I'll try to call you early next week.

Phase I has a 12 month metric. Are you guys making progress on that? They have been asking and we need to talk about it. Our reporting isn't tracking your stuff so well and I assume you are reporting separately to DARPA in Q reports?

Need a long chat about Jamie's work ASAP. He sent me a very long email that I haven't read yet but it is high priority to deal with the issues.

Hope you had a great vacation!

Raina

<b>DEMONSTRATE PROOF OF CONCEPT, FEASIBILITY AND SCALABILITY OF CHAD/VSV VACCINATION</b>				
Phase I task	6 months	12 months	18 months	24 months
<b>22.02, Proof-of-concept demonstratio</b>		Developed vaccine based on the G surface	Developed animal challenge models by performing	Tested the efficacy of the vaccines developed against G

<p><b>n of ChAd/VSV vaccination</b></p>		<p>protein antigens and based on the expression in either the VSV vaccine platform or the ChAd platform</p>	<p>intranasal and intratracheal inoculation with novel henipaviruses identified and isolated under TA1</p>	<p>antigens identified under TA1 using small animal modelling (hamster model) by demonstrating a neutralizing humoral response against the G antigen of interest</p> <p>Demonstrated statistically significant protection against viral infection in hamsters using survival analyses, presence or absence of disease symptoms, virus shedding and seroconversion against non-vaccine proteins using the DIVA approach</p>
<p>Phase II task</p>	<p>30 months</p>	<p>36 months</p>	<p>42 months</p>	
<p><b>22.02, feasibility and scalability of ChAd/VSV vaccination in bats</b></p>	<p>Investigated the protective efficacy in bats using the same parameters developed with the small animal models, but as the virus host relationship will unlikely to have severe disease outcome, we will use absence/reduction of shedding as our main parameter. In addition to virus shedding we will use seroconversion against non-</p>	<p>Developed environment stable vaccines for vaccination of wild bats</p>	<p>Tested environmental administration of vaccines in bats in the Ghana captive colony and quantified reduction of transmissibility of circulating viruses. Demonstrated that vaccine can protect bats and reduce shedding, and quantified extent of the minimum number of bats that need to be vaccinated in order to provide scalable protection</p>	



<p>vaccine proteins using the DIVA approach. The results will show two main metrics, the first is the absolute protection of bats against challenge and therefore no spillover. Or, no sterile protection of the vaccine, but reduction of the amount of virus shed and therefore reduction of the spillover risk. The metrics for spillover risk: 3 log reduction in shedding and 50% shortening of the shedding period, or complete abrogation of shedding altogether.</p>		<p>through vaccine transmission.</p>	
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**TRANSITION PLAN**

Phase II task	30 months	36 months	42 months	
	<p>Worked with MSU technology transfer infrastructure and personnel and CEPI program, to develop partnerships with vaccine manufacturers to enable the transfer of vaccine to industry for commercialization</p>	<p>Developed an inter-institutional agreement to enable the transfer of our discoveries to industry for commercialization</p>		

**DEMONSTRATE PROOF OF CONCEPT, FEASIBILITY, AND SCALABILITY OF CHAD/VSV VACCINATION**

**Task 22.02, Proof-of-concept demonstration of ChAd/VSV vaccination feasibility and scalability of ChAd/VSV vaccination in bats.** RML will develop and test a scalable vectored vaccine for target henipaviruses in bats. RML, with help from Cambridge, will assess the feasibility and scalability of the vaccine in bats.

**Milestones**

Vaccine development (RML):

- Design novel vaccines based on TAI
- Test by comparing measures of protection with historic hamster models (12mths)
- Test the effectiveness of the vaccines against novel henipaviruses (24mths)
- Demonstrate reduced probability of virus transmission among bats and among bats and recipient host species *in vivo* (42mths)
- Quantify scalability of ChAd/VSV vaccination in captive bats in Ghana (42mths)

-

-

**TRANSITION PLAN**

-

MSU and RML will develop the research transition plan.

**Milestones**

- Work with the MSU technology transfer infrastructure and personnel, and with the CEPI program to develop partnerships with vaccine manufacturers (30mths)
- Developed an inter-institutional agreement to enable the transfer of our discoveries to industry for commercialization (36mths)

On Sep 5, 2019, at 2:25 PM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:

The 13<sup>th</sup> should work,

Remind me, what did we say we would do in TA2 again?

cheers

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "LaTrielle, Sara" <(b) (6)>  
**Date:** Thursday, September 5, 2019 at 10:30 AM  
**To:** "(b) (6) <(b) (6)>  
**Cc:** "Plowright, Raina" <(b) (6)>  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Vincent,

Will next Friday work for you to present the TA2 Vaccine approach to DARPA- see below, please. They are keenly interested in hearing and learning more soon.

Thanks,

Sara LaTrielle  
Program Manager  
PREEMPT Project  
Montana State University  
(b) (6)

---

**From:** LaTrielle, Sara <(b) (6)>  
**Sent:** Tuesday, August 27, 2019 10:23 AM  
**To:** (b) (6)  
**Cc:** Plowright, Raina <(b) (6)>  
**Subject:** DARPA TA2 vaccine update: Sept 13 call?

Vincent,

DARPA (Monica and Amy) have requested you/your team to present the TA2 vaccine approach in a 30 min ppt. We have a pre-existing meeting with DARPA **Sept 13th, 1-2pm (MST)**, can you join for the first 30 minutes of this call?

Hope this works for you. Let me know.

Best,  
Sara

---

On Aug 26, 2019, at 10:54 AM, (b) (6) wrote:

Thank you Raina. Let's schedule a call to discuss the TA2 vaccine approach and updates. Can the team do Sept 3rd at 2:30pm EST? I think we can do 30

mins.

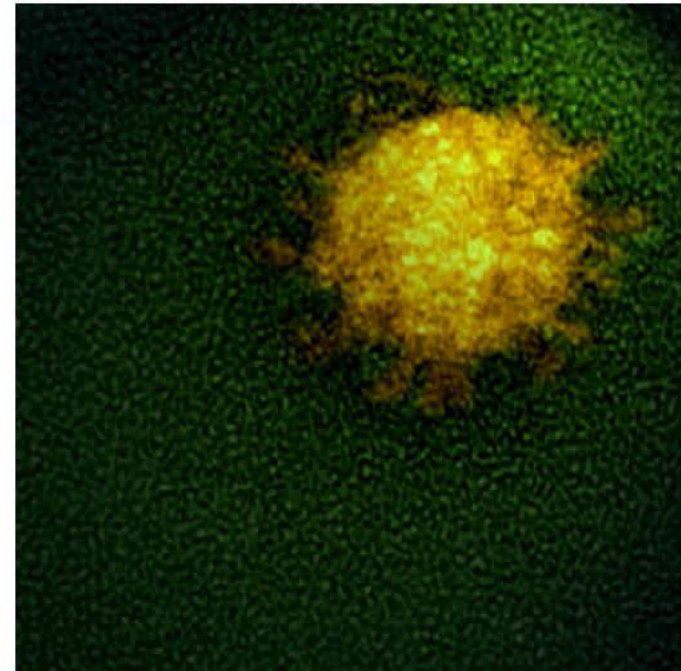
(b) (6)

-----  
(b) (6)

Support to Biological Technologies Office, DARPA  
Science and Technology Associates, Inc.

(b) (6)

## DARPA PREEMPT



# Virus Ecology Unit

VINCENT MUNSTER, PH.D.

# animal models, why?

- **Understand the host-pathogen interaction**

- Organ and cellular tropism
- Interaction with innate and adaptive immune system
- Transmission studies
- Natural reservoir studies
- Modelling recrudescence

- **Preclinical development of prophylactic and therapeutic medical countermeasures**

- Vaccine development
- Antibody based therapeutics
- Antivirals

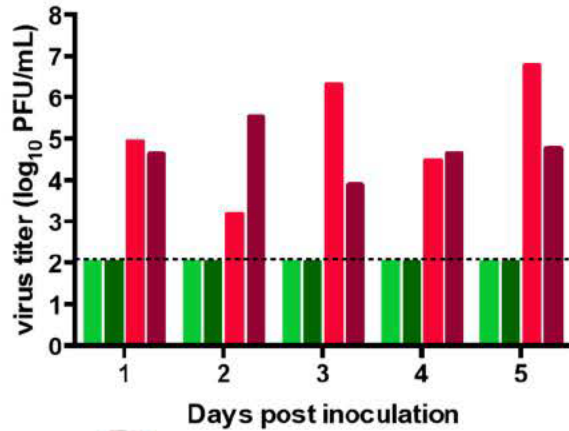
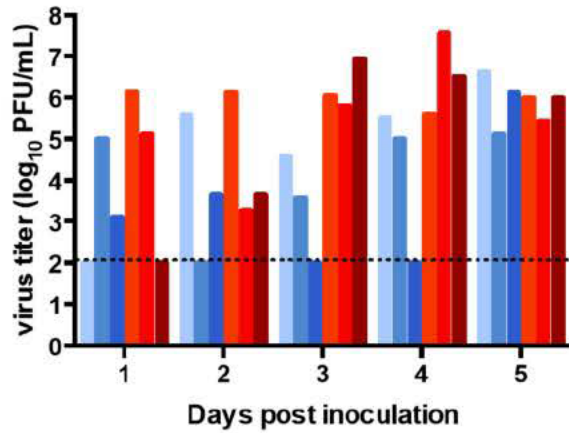


## Animal models for Nipah virus

- Mice
- Hamsters
- Ferrets
- Cats
- Bats
- Non-human primates
- Pigs

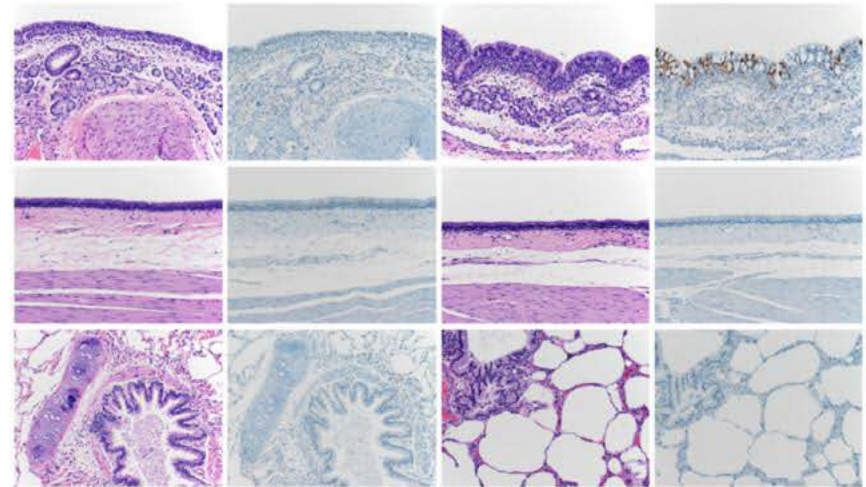
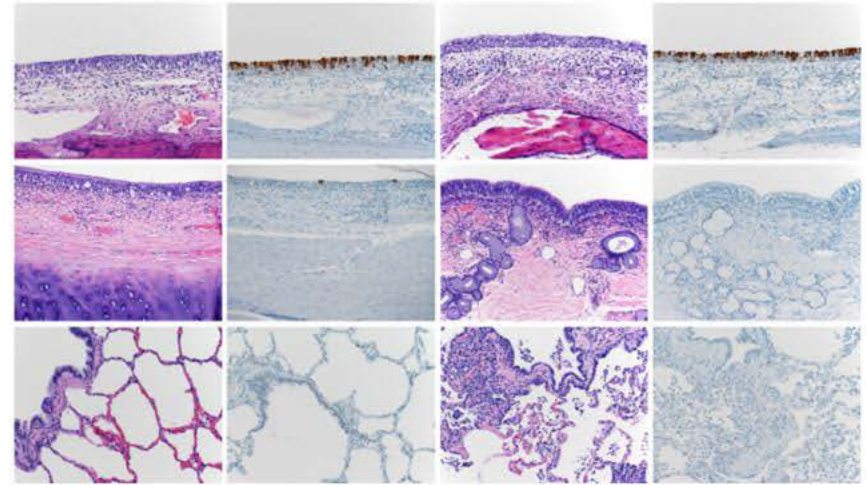


# 22.02, Proof-of-concept demonstration camel vaccination, proof-of-principle or viable strategy ?-



- CA1
- CA2
- CA3
- CA4
- CA5
- CA6

- A1
- A2
- A3
- A4





## Experimental work in bats at RML

- Ability for a variety of bats species:  
*Pteropus*, *Rousettus* and *Artibeus* spp.
- Infrastructure and SOPs in BSL4
- SA and DSAT approvals in place



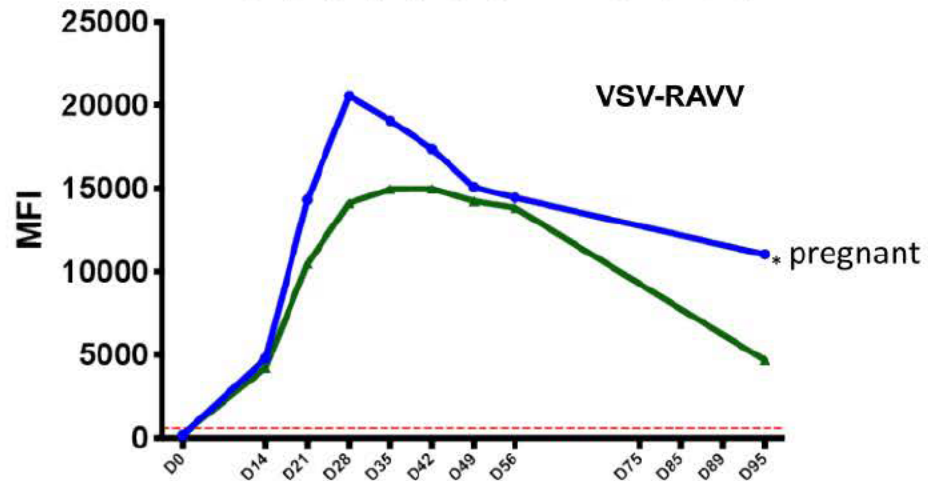
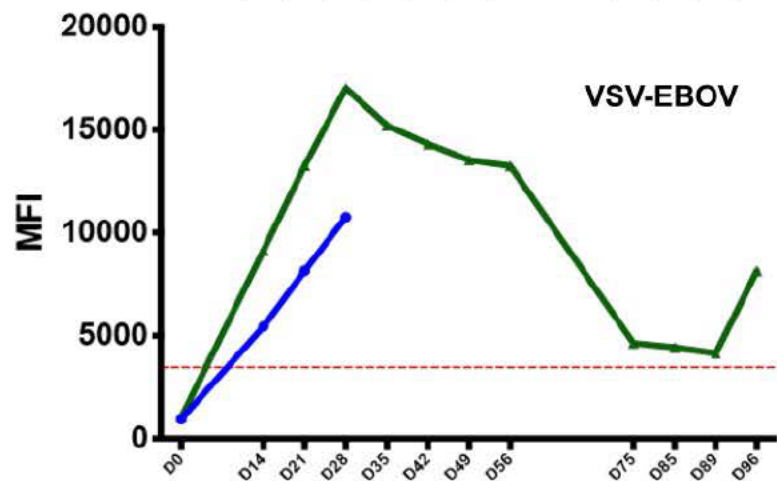
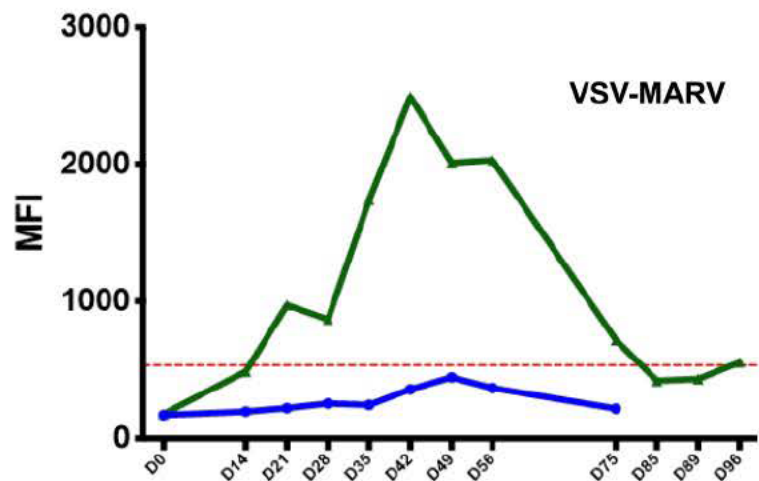
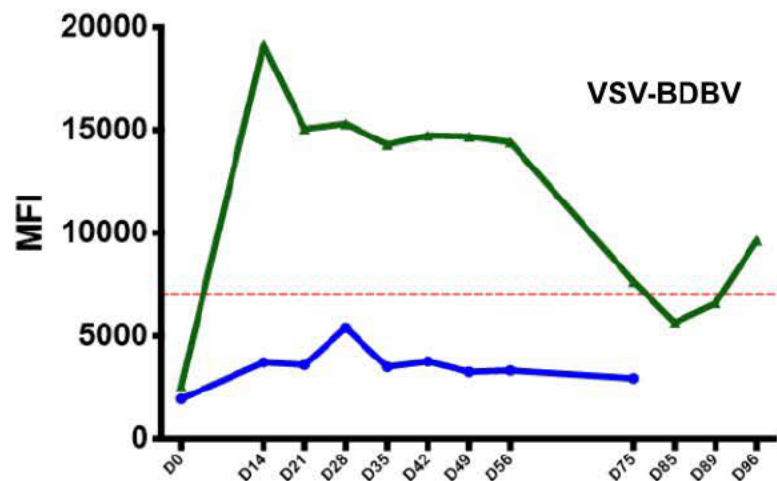
## 22.02, Proof-of-concept demonstration of VSV vaccination

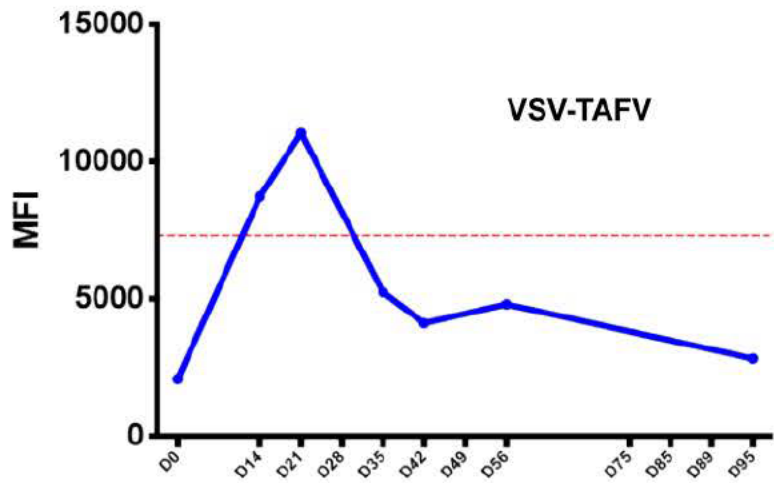
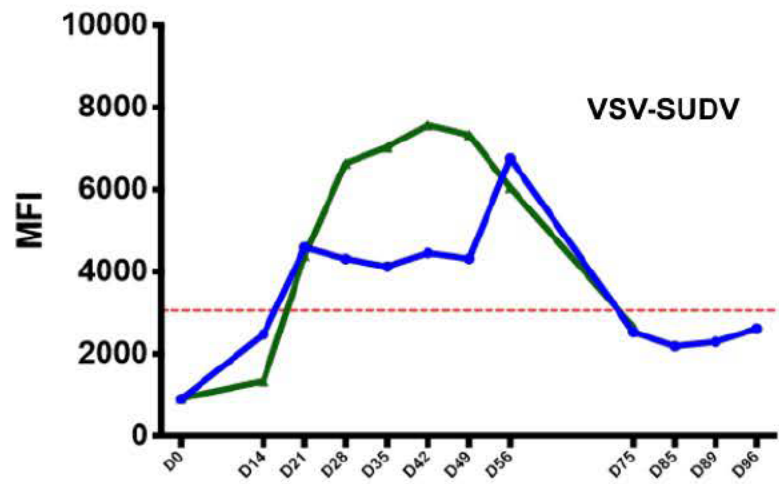
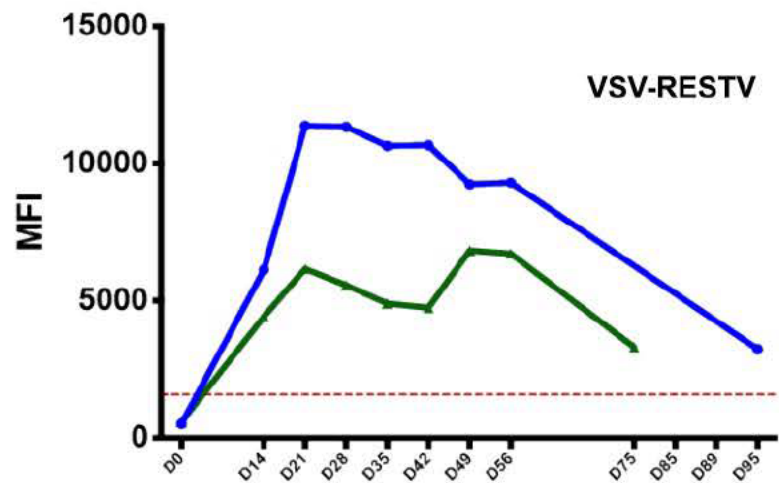
### **Ideal vaccine**

- Only single dose required for protection
- Short time to immunity
- Long-lasting immunity
- Easy to produce

### **rVSV vaccine vector**

- *Rhabdoviridae* family (negative strand, nonsegmented virus)
- Only single dose required for protection
- Short time to immunity
- Induces strong innate and adaptive immune response
- Very low level of preexisting immunity in human population
- Replicates to high titers in mammalian cell lines

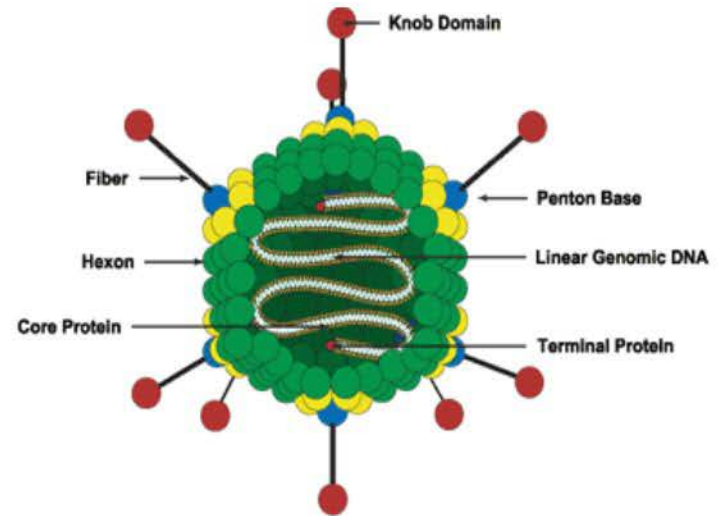




## 22.02, Proof-of-concept demonstration of ChAd vaccination

### Chimpanzee-derived adenovirus

- Replication-defective
- Expresses protein of interest
- Safety data across age cohorts
- Induce strong immunity after one dose
- Easy to manipulate and produce
- Enhanced Stability



### Induction humoral and cellular responses

- full-length protein = conformational epitopes

### High Levels & Longevity of Protein Expression

- virus can infect local cells & produce high levels of protein
- antigen at immunization site -6 months

Preclinical small  
animal model



Preclinical non-  
human primate  
model



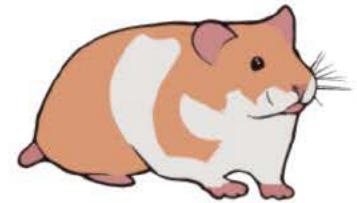
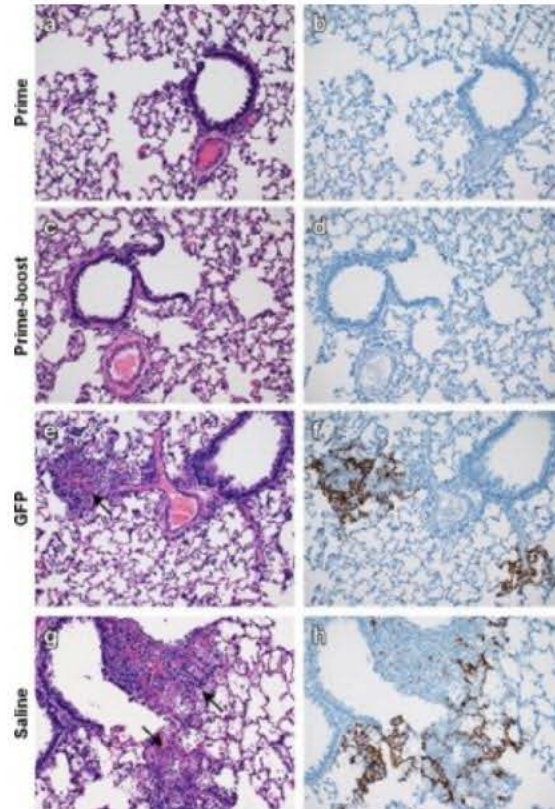
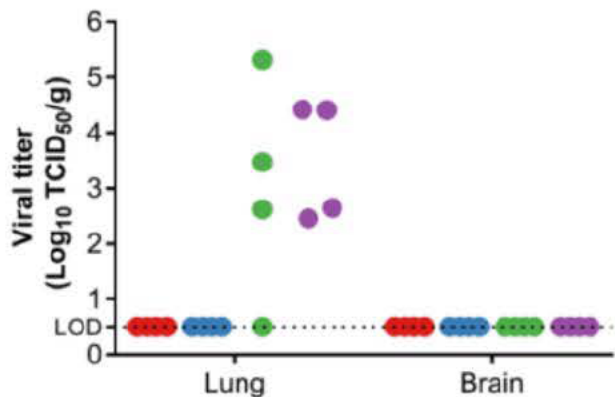
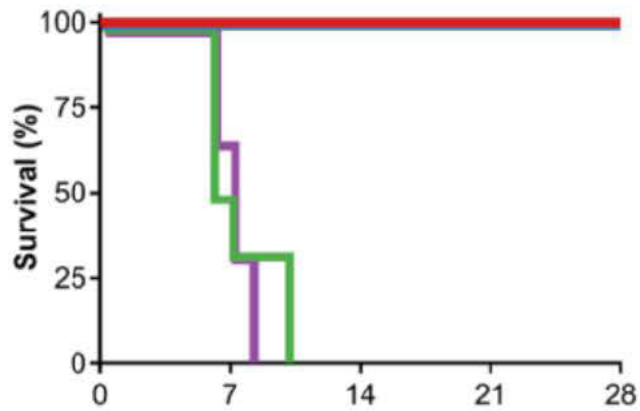
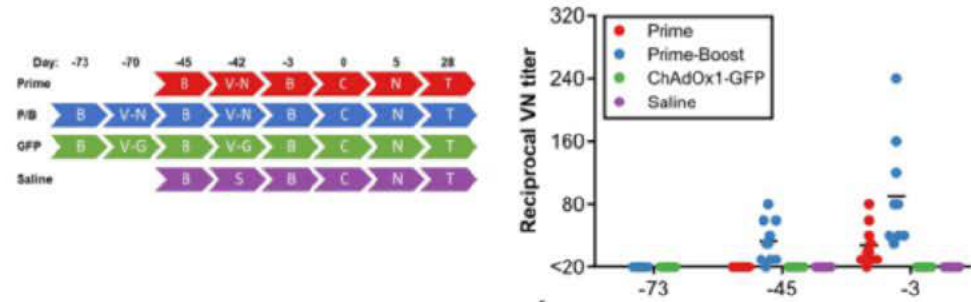
Clinical trials  
(phase 1)



# CEPI vaccine development, Nipah virus

## Homologous challenge, Nipah Bangladesh

- Vaccination dose:  $1 \times 10^8$  IU/animal
- Challenge dose: 1000LD<sub>50</sub> intraperitoneal

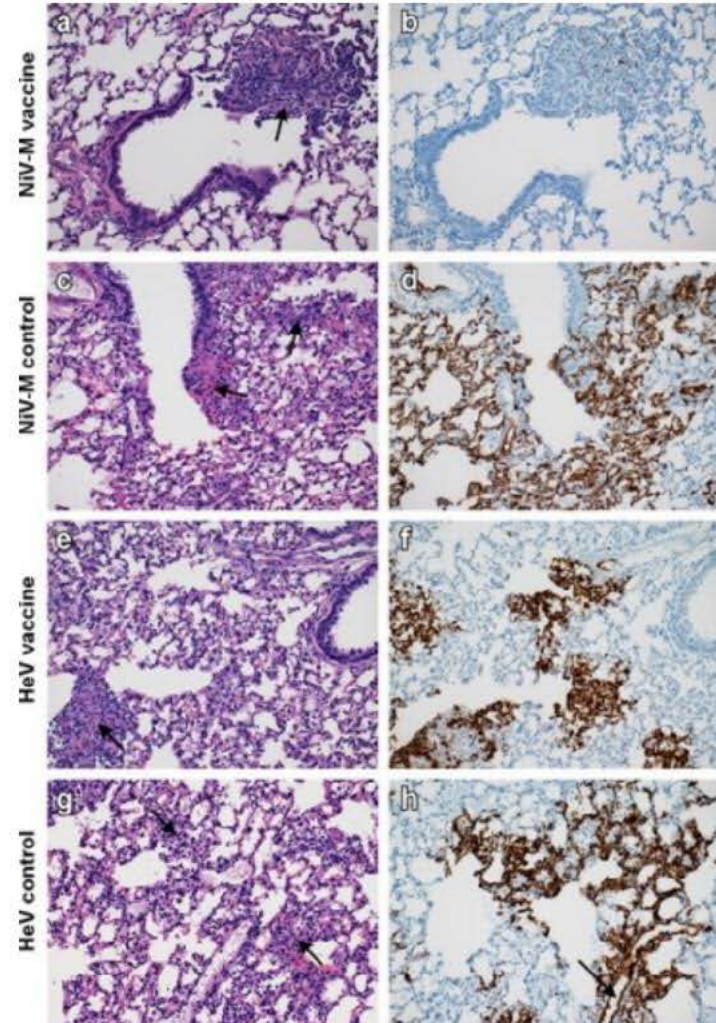
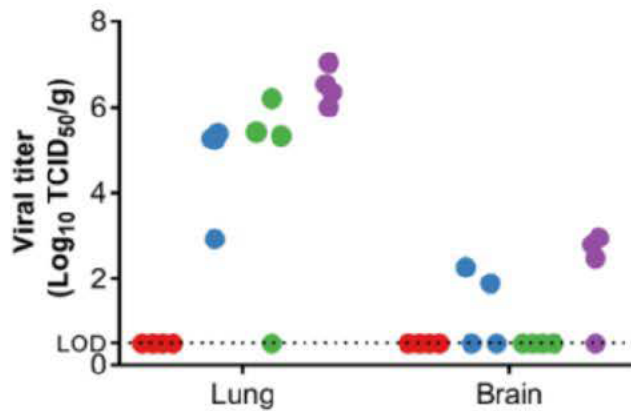
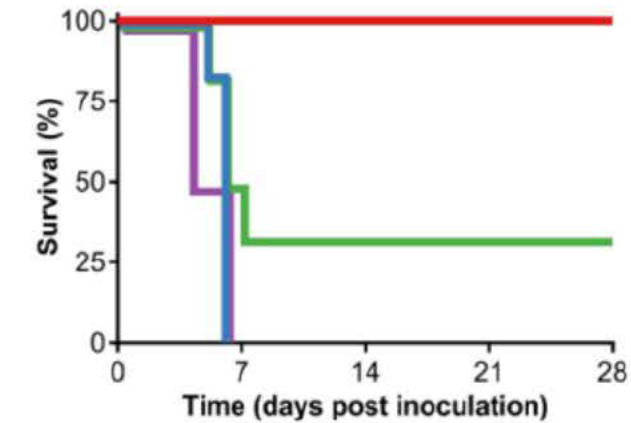


# CEPI vaccine development, Nipah virus

## Heterologous challenge, Nipah Malaysia and Hendra virus



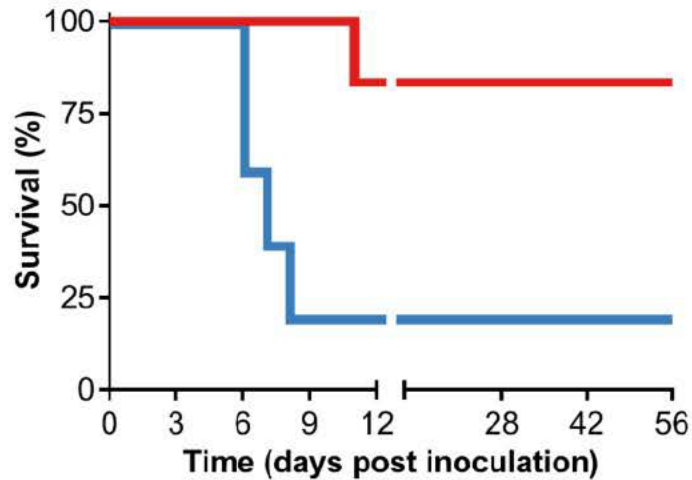
- Vaccination dose:  $1 \times 10^8$  IU/animal
- Challenge dose: 1000LD<sub>50</sub> intraperitoneal



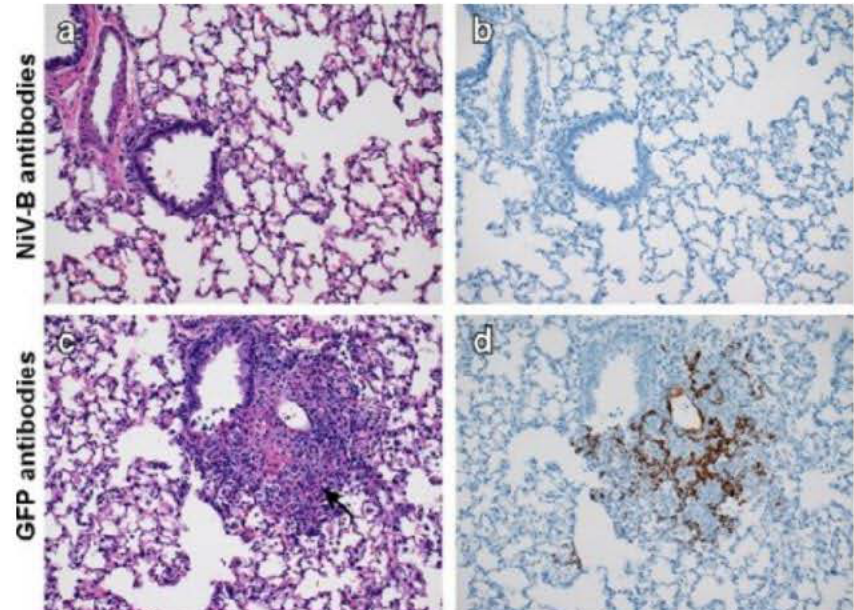
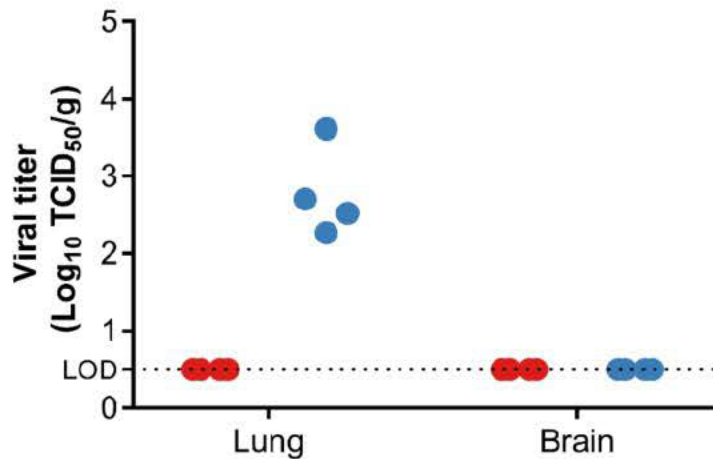


# CEPI vaccine development, Nipah virus

## Passive transfer, homologous challenge



- Passive transfer intraperitoneal
- Challenge dose: 1000LD<sub>50</sub> intraperitoneal





# Development of bat challenge models for (novel) henipaviruses

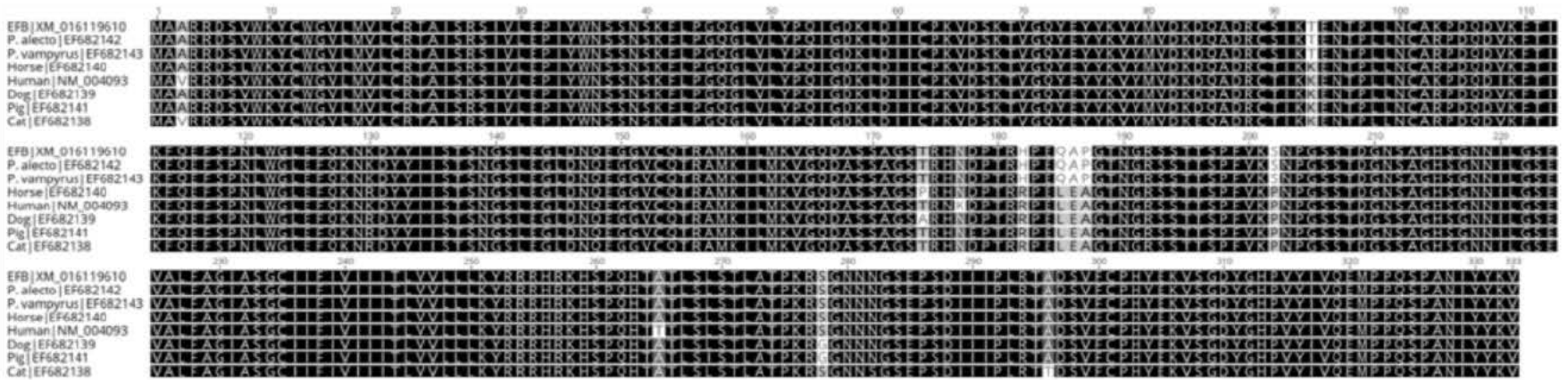


# Bat model, Nipah virus Henipa receptor homology across species



(A)

Ephrin B2



(B)

Ephrin B3





# Bat model, Nipah virus

## Rousettus aegyptiacus Nipah virus challenge, lack of shedding

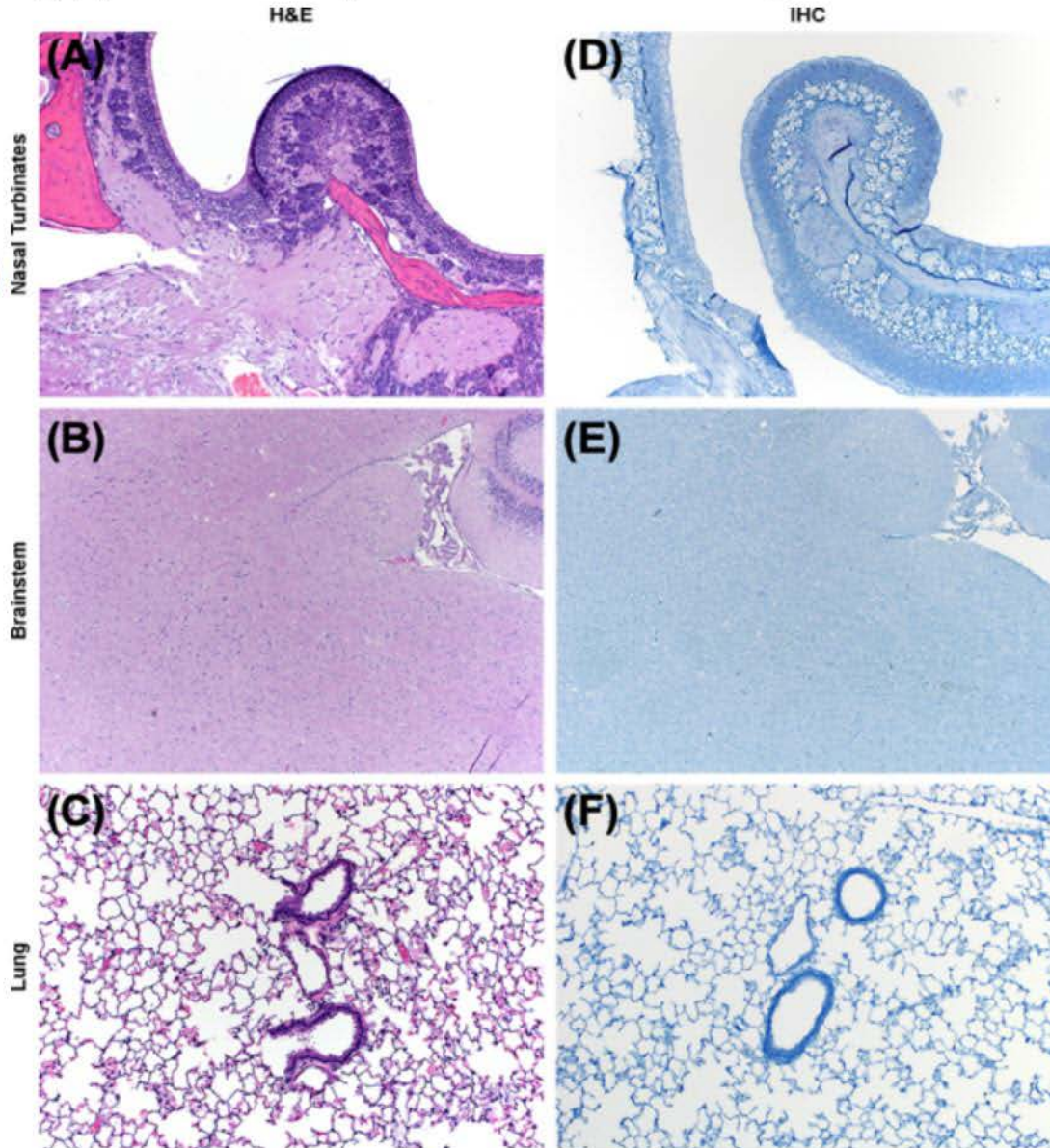


Swab Type	0 - 3 DPI	4 - 7 DPI	8 - 14 DPI	18 DPI	21 DPI	25 DPI	28 DPI
Oronasal	>40 (12)	>40 (8)	>40 (4)	>40 (4)	>40 (4)	>40 (4)	>40 (4)
Urogenital	>40 (12)	>40 (8)	>40 (4)	>40 (4)	>40 (4)	>40 (4)	>40 (4)
Rectal	>40 (12)	>40 (8)	>40 (4)	>40 (4)	>40 (4)	>40 (4)	>40 (4)
Excreta pan	>40 (3)	>40 (2)	>40 (1)	>40 (1)	>40 (1)	>40 (1)	>40 (1)

Tissue Sample	3 DPI	7 DPI	28 DPI
Lung	>40 (4)	>40 (4)	>40 (4)
Kidney	>40 (4)	>40 (4)	>40 (4)
Bladder	>40 (4)	>40 (4)	>40 (4)
Brain (Frontal)	>40 (4)	>40 (4)	>40 (4)
Brain (Cerebellum)	>40 (4)	>40 (4)	>40 (4)
Brainstem	>40 (4)	>40 (4)	>40 (4)
Nasal Turbinates	>40 (4)	>40 (4)	>40 (4)

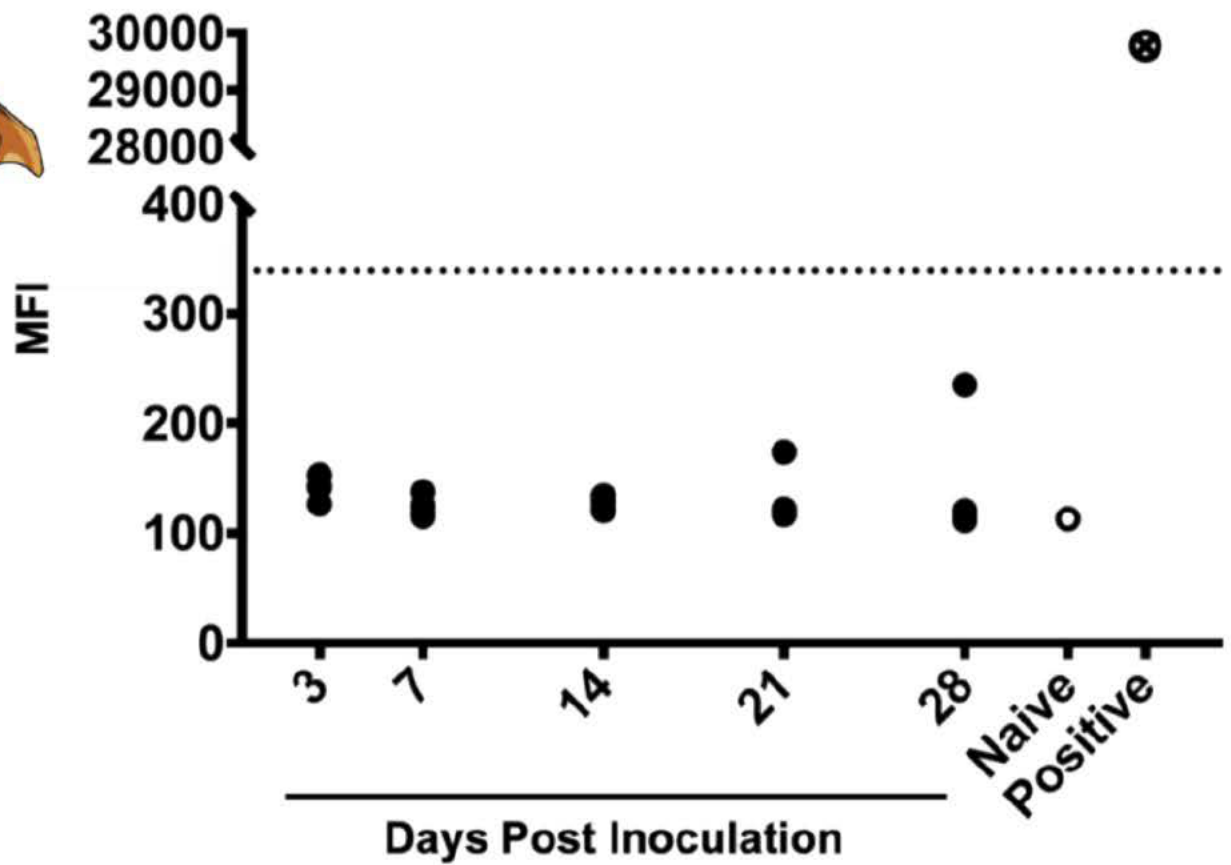
# Bat model, Nipah virus

## Rousettus aegyptiacus Nipah virus challenge, lack of replication



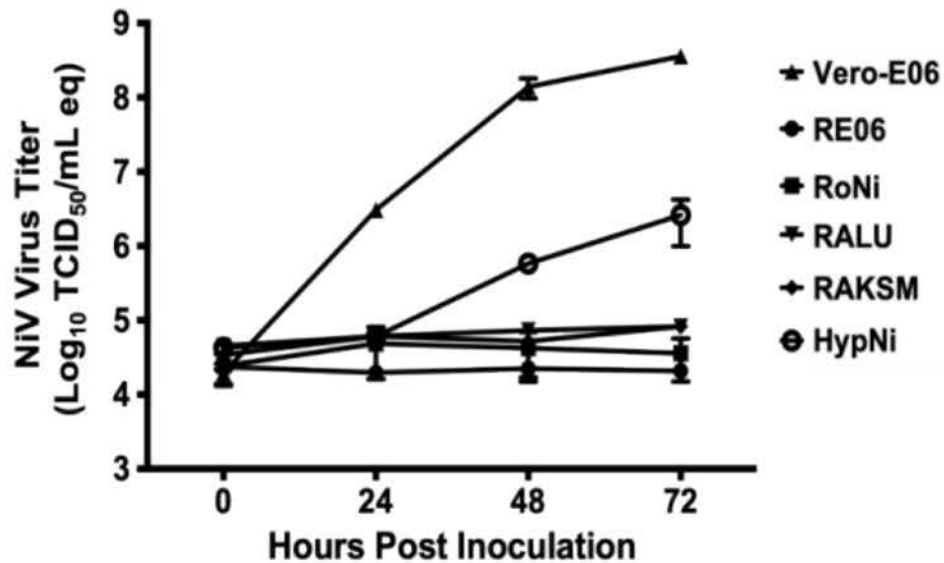
# Bat model, Nipah virus

*Rousettus aegyptiacus* Nipah virus challenge, lack of seroconversion



# Bat model, Nipah virus

## *Artibeus jamaicensis*, henipa susceptibility



- Not all bat cells susceptible
- Cedar virus and Nipah virus grow on *Artibeus* cells
- Cedar virus has been shown to infect *Artibeus* (Dr. Schountz CSU)



# Proof-of-concept demonstration of henipa vaccination

## Conclusions



- A single-dose ChAdOx1-vectored vaccine provides
  - Nipah virus in hamsters (homologous and heterologous)
  - Prime-boost generates higher antibody responses
- ChAdOx1 promising vaccine platform for emerging viruses
- Rousettus bats not susceptible for Nipah virus infection
- VSV-vaccine induces temporal humoral response against targets in bats
- Hamster, and scheduled NHP work with the ChAdOX-Nipah will allow careful comparison into species specific responses and correlates of protection

# Proof-of-concept demonstration of henipa vaccination

## Future work



- Establishment of Nipah model in Artibeus bats
  - ASP approved, submission underway to ACURO
- Artibeus vaccine study with the ChadOx Nipah virus vaccine
- Assessment of generated henipa-sequences to potentially be included in countermeasure development (e.g. Ghana bat virus)
- Development of vaccine delivery strategies



# Proof-of-concept demonstration of henipa vaccination

## Potential pitfalls



- Speed of ACURO approval
- Lack of sufficient funding
- Potential no susceptible animal species for vaccine testing

# Acknowledgements



## **Virus Ecology Unit**

Trent Bushmaker  
Neeltje van Doremalen  
Bob Fischer  
Jonathan Schulz  
Dania Figueroa  
Stephanie Seifert  
Michael Letko (DARPA)  
Kwe Claude Yinda  
Irene Offei Owusu  
Jeremiah Matson  
Vicky Avanzato  
Jyothi Purushotham

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Wed, 11 Sep 2019 19:30:10 +0000  
**To:** Olivier Restif  
**Cc:** Plowright, Raina; Hector Aguilar-Carreno; James Wood; Andrew Cunningham; Louise Gibson; (b) (6) Aaron Morris; Elinor Jax; Alex Washburne; LaTrielle, Sara  
**Subject:** Re: Genotype discussion: PREEMPT

Working on it!

Cheers,

Vincent

On Sep 9, 2019, at 03:22, Olivier Restif <(b) (6)> wrote:

Hi Vincent,

Just a reminder about setting up the MTA for our Ghanaian samples. If I remember correctly, you were going to send Louise a template so we could get the ball rolling. Let us know if you need anything from us.

Best wishes

Olivier

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Sunday, September 8, 2019 10:29:07 PM  
**To:** Plowright, Raina <(b) (6)>  
**Cc:** Hector Aguilar-Carreno <(b) (6)> James Wood <(b) (6)> Andrew Cunningham <(b) (6)> Olivier Restif <(b) (6)> Louise Gibson <(b) (6)> Aaron Morris <(b) (6)> Elinor Jax <(b) (6)> Alex Washburne <(b) (6)> LaTrielle, Sara <(b) (6)>  
**Subject:** Re: Genotype discussion: PREEMPT

Thanks,

Again sorry for the hassle

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <(b) (6)>  
**Date:** Saturday, September 7, 2019 at 10:47 AM

**To:** "(b) (6) <(b) (6)>  
**Cc:** Hector Aguilar-Carreno <(b) (6)> James Wood <(b) (6)> Andrew  
Cunningham <(b) (6)> Olivier Restif <(b) (6)> Louise Gibson  
<(b) (6)> Jamie Lloyd-Smith <(b) (6)> Aaron Morris  
<(b) (6)> Elinor Jax <(b) (6)> Alex Washburne  
<(b) (6)> "LaTrielle, Sara" <(b) (6)>  
**Subject:** Re: Genotype discussion: PREEMPT

I know Jamie cannot make it either. I think we should reschedule because the conversation with Vincent (MTAs, new collaboration) is priority right now.

We will send a doodle poll.

Sent from my iPhone

On Sep 7, 2019, at 10:17 AM, Munster, Vincent (NIH/NIAID) [E] <(b) (6)> wrote:

Hi Guys,

My sincere apologies but I will not be able to make this call due to a scheduling conflict. The initial email got a bit lost due to travel circumstances. Hopefully we can re-schedule for the week after.

I'm really sorry that this slipped my mind,

Regards,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Schountz, Tony  
**Sent:** Tue, 10 Sep 2019 22:01:03 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Cc:** Eric Laing  
**Subject:** Upcoming R01 grant submission

Hi Vincent,

Eric and I are just getting the henipavirus proposal started. We have a rough idea of the Aims and they are basically:

**Aim 1. Determine whether ephrin virus receptor usage mediates henipavirus pathogenesis.**

*Hypothesis:* Virus receptor usage of ephrin-B3 is not the key virus factor that determines henipavirus pathogenicity.

*Rationale.* Ephrin-B3 distribution in the brainstem and preferential receptor binding to ephrin-B3 by NiV has been proposed to increase encephalitic disease presentation following NiV infection. Unlike NiV, ephrin-B3 is not utilized by CedV as a receptor, but CedV can utilize an expanded repertoire of ephrins as virus receptors including ephrin-B1, -A2 and -A5. We will design a recombinant ephrin-B3 using CedV G (rG<sub>B3</sub>) by point mutation of G residues that are predicted to facilitate the receptor binding interaction with the ephrin-B3 G-H loop. Ephrin interaction and functionality of rG<sub>B3</sub> will be first determined through co-precipitation and cell-cell fusion assays. Using a previously described reverse genetics system for the generation of replication competent, recombinant CedV, we will then rescue rCedV G<sub>B3</sub> at biosafety level-4 and investigate pathogenesis of an ephrin-B3 using rCedV in an established henipavirus disease animal model.

**Aim 2. Investigate the interferon antagonist potential of putative henipaviruses.**

*Hypothesis:* Compared to NiV and HeV, the V and W proteins of putative henipaviruses, GhV and MojV, less effectively suppress the interferon response.

*Rationale.* Neither MojV nor GhV have been isolated and whether they represent potential zoonotic henipaviruses remains unknown. GhV G protein interacts with ephrin-B2, but not ephrin-B3 and the receptor for MojV has not been identified and ephrin ligands seem unlikely. However, both MojV and GhV are predicted to express V and W proteins, yet interactions with the interferon (IFN) signaling pathway have not been explored. To investigate this we will monitor intracellular localization and interactions of MojV and GhV V and W proteins with IFN pathway, and monitor the ability of MojV and GhV and W to suppress IFN stimulated genes (ISG) in fruit bat, and comparable human and rodent-derived cell lines to investigate host-dependent differences.

**Aim 3. To determine bat immune responses to henipaviruses.**

*Hypothesis:* Humoral and cell-mediated immunities play critical roles in bats to control henipavirus infections. *Rationale.* We have demonstrated that Cedar virus infects Jamaican fruit (JF) bats but it does not cause disease in JF bats. We suspect that NiV also does not cause disease in JF bats. We will examine the role of humoral and cell-mediated immune responses in control of virus infections. We will use depletion experiments to assess the roles of B and T cells, and examine the role of interferon-gamma for the control of virus in bats as we have available reagents described in preliminary studies to perform the proposed experiments.

We don't have a draft yet, but we'd sure like to have your input as to things you think we ought to go after. I have to head to main campus for a meeting but will check email later tonight.

Safe travels.

T.

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Mon, 9 Sep 2019 22:39:49 +0000  
**To:** Alison Peel  
**Cc:** Plowright, Raina  
**Subject:** Re: Time in Montana after PI meeting

Lol, nope. Let me see if we could arrange [REDACTED] (b) (6)

On Sep 9, 2019, at 17:21, Alison Peel <[REDACTED] (b) (6)> wrote:

Sure! Let me know if there's anything in particular you'd like to hear about.

Is there public transport between Hamilton and Bozeman?

**From:** Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Sent:** Tuesday, September 10, 2019 7:46:18 AM  
**To:** Alison Peel <[REDACTED] (b) (6)>  
**Cc:** Plowright, Raina <[REDACTED] (b) (6)>  
**Subject:** Re: Time in Montana after PI meeting

That sounds great, you'd like to give a talk too?

On Sep 9, 2019, at 16:06, Alison Peel <[REDACTED] (b) (6)> wrote:

Hi Raina and Vincent,

I'm planning on staying [REDACTED] (b) (6) a few days after the PI meeting (until Wednesday 23rd) to allow for some meetings and visits.

**Vincent** - I'd love to come and see the lab and meet your team. Would it be possible to do this on Monday 21st October?

**Raina** - I've mentioned to Devin that I'll be around on Tuesday 20th if she wanted to have any meetings about her PhD. Same goes for Maureen (though I haven't mentioned it yet). Are you likely to have any time on that day?

I think I'll try and visit Matson's tooth lab on the [REDACTED] (b) (6)

Looking forward to it!

Cheers

Ali

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Mon, 9 Sep 2019 12:29:50 -0600  
**To:** Plowright, Raina  
**Cc:** LaTrielle, Sara  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Sorry for the confusion,

The 13<sup>th</sup> is a solid yes, only need to find the time to get slides together in time

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" <(b) (6)>  
**Date:** Monday, September 9, 2019 at 12:23 PM  
**To:** '(b) (6) <(b) (6)>  
**Cc:** "LaTrielle, Sara" <(b) (6)>  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

If you can't do the call, let us know asap as there is lots of planning and coordination involved on our end. :-)

On Sep 9, 2019, at 11:57 AM, Munster, Vincent (NIH/NIAID) [E] <(b) (6)> wrote:

I'll try to make it work, but no guarantees. Bit in a time crunch here

Cheers,

Vincent

On Sep 9, 2019, at 11:29, LaTrielle, Sara <(b) (6)> wrote:

Vincent,

Will you have slides to present to DARPA? If so, can you please send these to me by COB Wednesday that would be best, but I see you are away so it is possible to get these from you Thursday till noon and still be able to incorporate at the last minute. DARPA requests all slides be sent at least 24-48 hours in advance. Thanks.



I just forwarded the meeting invite for this Friday to you, from DARPA/Monica. Call-in details are there.

Sara

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**From:** Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Sent:** Friday, September 6, 2019 2:31 PM  
**To:** Plowright, Raina <[REDACTED] (b) (6)>  
**Cc:** LaTrielle, Sara <[REDACTED] (b) (6)>  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Travelling until Wednesday, so give me a holler on Thursday. Tomorrow would work too,

For Jamie's work I thought he was primarily dealing with Hector? I know he is frustrated, but there is not that much from my end I can do about this (more a capacity problem as we are dealing with bsl4 stuff). I kind of relied on him/amandine to at least come-up with a plan/reagents to do some basic testing here at RML but need somebody who is pulling that (e.g. finding the appropriate cellines etc.)

For the screening we are on track, sequencing is on its way so hopefully we will be able to feed some into the modelling. One caveat is that the bats are shedding relatively little, so not that good for sequencing. The first screens for pan-paramyxovirus has started as well so hopefully we'll find smtg novel soon.

In hindsight, some of the TA1s might be a bit ambitious given their reliance on the screens, but that's all hindsight. Ther CNH grant should be well in. tack so hopefully we'll have that screening finished soon-ish).

Btw, I think it is going quite well, there will always be parts which will not work-out.

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Date:** Thursday, September 5, 2019 at 4:58 PM  
**To:** "[REDACTED] (b) (6)" <[REDACTED] (b) (6)>  
**Cc:** "LaTrielle, Sara" <[REDACTED] (b) (6)>  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Here are the metrics.... Lots to chat about with other things so I'll try to call you early next week. Phase I has a 12 month metric. Are you guys making progress on that? They have been asking and we need to talk about it. Our reporting isn't tracking your stuff so well and I assume you are reporting separately to DARPA in Q reports?

Need a long chat about Jamie's work ASAP. He sent me a very long email that I haven't read yet but it is high priority to deal with the issues.

Hope you had a great vacation!

Raina

<b>DEMONSTRATE PROOF OF CONCEPT, FEASIBILITY AND SCALABILITY OF CHAD/VSV VACCINATION</b>				
Phase I task	6 months	12 months	18 months	24 months
<b>22.02, Proof-of-concept demonstration of ChAd/VSV vaccination</b>		Developed vaccine based on the G surface protein antigens and based on the expression in either the VSV vaccine platform or the ChAd platform	Developed animal challenge models by performing intranasal and intratracheal inoculation with novel henipaviruses identified and isolated under TA1	<p>Tested the efficacy of the vaccines developed against G antigens identified under TA1 using small animal modelling (hamster model) by demonstrating a neutralizing humoral response against the G antigen of interest</p> <p>Demonstrated statistically significant protection against viral infection in hamsters using survival analyses, presence or absence of disease symptoms, virus shedding and seroconversion against non-vaccine proteins using the DIVA approach</p>
Phase II task	30 months	36 months	42 months	
<b>22.02, feasibility and scalability of ChAd/VSV vaccination in bats</b>	Investigated the protective efficacy in bats using the same parameters developed with the small animal	Developed environment stable vaccines for vaccination of wild bats	Tested environmental administration of vaccines in bats in the Ghana captive colony and quantified	

	<p>models, but as the virus host relationship will unlikely to have severe disease outcome, we will use absence/reduction of shedding as our main parameter. In addition to virus shedding we will use seroconversion against non-vaccine proteins using the DIVA approach. The results will show two main metrics, the first is the absolute protection of bats against challenge and therefore no spillover. Or, no sterile protection of the vaccine, but reduction of the amount of virus shed and therefore reduction of the spillover risk. The metrics for spillover risk: 3 log reduction in shedding and 50% shortening of the shedding period, or complete abrogation of shedding altogether.</p>		<p>reduction of transmissibility of circulating viruses. Demonstrated that vaccine can protect bats and reduce shedding, and quantified extent of the minimum number of bats that need to be vaccinated in order to provide scalable protection through vaccine transmission.</p>	
<b>TRANSITION PLAN</b>				
Phase II task	30 months	36 months	42 months	

	Worked with MSU technology transfer infrastructure and personnel and CEPI program, to develop partnerships with vaccine manufacturers to enable the transfer of vaccine to industry for commercialization	Developed an inter-institutional agreement to enable the transfer of our discoveries to industry for commercialization		
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**DEMONSTRATE PROOF OF CONCEPT, FEASIBILITY, AND SCALABILITY OF CHAD/VSV VACCINATION**

**Task 22.02, Proof-of-concept demonstration of ChAd/VSV vaccination feasibility and scalability of ChAd/VSV vaccination in bats.** RML will develop and test a scalable vectored vaccine for target henipaviruses in bats. RML, with help from Cambridge, will assess the feasibility and scalability of the vaccine in bats.

**Milestones**

Vaccine development (RML):

- Design novel vaccines based on TAI
- Test by comparing measures of protection with historic hamster models (12mths)
- Test the effectiveness of the vaccines against novel henipaviruses (24mths)
- Demonstrate reduced probability of virus transmission among bats and among bats and recipient host species *in vivo* (42mths)
- Quantify scalability of ChAd/VSV vaccination in captive bats in Ghana (42mths)

-  
-

**TRANSITION PLAN**

-

MSU and RML will develop the research transition plan.

**Milestones**

- Work with the MSU technology transfer infrastructure and personnel, and with the CEPI program to develop partnerships with vaccine manufacturers (30mths)

- Developed an inter-institutional agreement to enable the transfer of our discoveries to industry for commercialization (36mths)

On Sep 5, 2019, at 2:25 PM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

The 13<sup>th</sup> should work,

Remind me, what did we say we would do in TA2 again?

cheers

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** "LaTrielle, Sara" <[REDACTED] (b) (6)>  
**Date:** Thursday, September 5, 2019 at 10:30 AM  
**To:** [REDACTED] (b) (6) <[REDACTED] (b) (6)>  
**Cc:** "Plowright, Raina" <[REDACTED] (b) (6)>  
**Subject:** Re: DARPA TA2 vaccine update: Sept 13 call?

Vincent,

Will next Friday work for you to present the TA2 Vaccine approach to DARPA- see below, please. They are keenly interested in hearing and learning more soon.

Thanks,

Sara LaTrielle  
Program Manager  
PREEMPT Project  
Montana State University  
[REDACTED] (b) (6)

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**From:** LaTrielle, Sara <[REDACTED] (b) (6)>  
**Sent:** Tuesday, August 27, 2019 10:23 AM  
**To:** [REDACTED] (b) (6) <[REDACTED] (b) (6)>  
**Cc:** Plowright, Raina <[REDACTED] (b) (6)>  
**Subject:** DARPA TA2 vaccine update: Sept 13 call?

Vincent,

DARPA ([REDACTED] (b) (6)) have requested you/your team to present the TA2 vaccine approach in a 30 min ppt. We have a pre-existing meeting with DARPA Sept 13th, 1-2pm (MST), can you join for the first 30 minutes of this call?

Hope this works for you. Let me know.

Best,  
Sara

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On Aug 26, 2019, at 10:54 AM, [REDACTED] (b) (6) wrote:

Thank you Raina. Let's schedule a call to discuss the TA2 vaccine approach and updates. Can the team do Sept 3rd at 2:30pm EST? I think we can do 30 mins.

[REDACTED] (b) (6)

[REDACTED] (b) (6)

Support to Biological Technologies Office, DARPA  
Science and Technology Associates, Inc.

[REDACTED] (b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Wed, 4 Sep 2019 09:52:14 -0600  
**To:** Letko, Michael (NIH/NIAID) [F]; van Doremalen, Neeltje (NIH/NIAID) [E]  
**Subject:** Mutants EM

Hi Michael,  
For the EM, see fig 5. Pretty straight forward. You should be able to do this on HAEs as well?

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2812334/#!po=46.8750>

see fig 6.

Another assay you might want to do to study binding is to make a S1-FC of WT (which we should have already from the Bosch lab) and the mutants to study binding potential to different respiratory tissues. Or construct nanoparticles

[https://www.pnas.org/content/114/40/E8508?ijkey=8a4fb076bfa6f21b55df184369c2e64f84937074&keytype=tf\\_ipsecsha](https://www.pnas.org/content/114/40/E8508?ijkey=8a4fb076bfa6f21b55df184369c2e64f84937074&keytype=tf_ipsecsha)

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 3 Sep 2019 10:24:03 -0600  
**To:** Emily Gurley  
**Cc:** Ausraful Islam; Barbara Han (b) (6) Plowright, Raina  
**Subject:** Re: Rousettus roost urine collection proposal

I think it's a good idea, interestingly we have a paper in JID coming out where we tried to infect Rousettus aegyptiacus with Nipah, and it did not do anything. Suggesting, quite extensive species barriers in the natural host (likely innate)

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** Emily Gurley <(b) (6)>  
**Date:** Monday, August 26, 2019 at 9:04 AM  
**To:** '(b) (6) <(b) (6)>  
**Cc:** Ausraful Islam <(b) (6)> "Barbara Han (b) (6) <(b) (6) "Plowright, Raina" <(b) (6)>  
**Subject:** RE: Rousettus roost urine collection proposal

Vincent,

I'm following up to see what your thoughts are about this. I don't want to collect more samples for your lab without your endorsement.

Emily

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**From:** Plowright, Raina <(b) (6)>  
**Sent:** Wednesday, August 21, 2019 3:30 PM  
**To:** Emily Gurley <(b) (6)>  
**Cc:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Ausraful Islam <(b) (6)> Barbara Han (b) (6) <(b) (6)>  
**Subject:** Re: Rousettus roost urine collection proposal

Emily, this is an excellent plan and I'm very enthusiastic about you doing this. As you say, if it yields positives, it will be a proof of concept for the machine learning work and it will provide valuable information on sources of potential human exposures. Raina



On Aug 21, 2019, at 1:00 PM, Emily Gurley <[REDACTED]> (b) (6) wrote:

Raina and Vincent,

Rajib, Barbara and I have been discussing the utility and feasibility of including other bat species in our sample collection in Bangladesh, to look for other possible henipavirus reservoir species. During her recent visit to Dhaka, Barbara and Rajib combined the results from her machine learning analyses to target species and species with evidence of infection. With that information, we created a ranked list of species where we have published evidence of infection and where the model had a high prediction of infection. Based on the highest ranked species, Rajib discussed the feasibility of doing some specimen collection with existing PREEMPT resources.

The highest ranked bat to sample, from both the data and model prediction perspective, was Rousettus. Luckily, it's also really easy to get roost urine samples from them since they roost in caves or old temples. Just a few hours of effort can get us high quality samples from a roost. Rajib has proposed doing one day of Rousettus roost urine collection per month which can be done within existing team resources. This would yield approximately 20 additional urine samples per month.

This specimen collection is not at a large scale so has limited utility. That said, we will sample nearby one of our longitudinal roost sites, which will enable us to compare any viruses that come from this effort. We know that these bats share food sources, including date palm sap, so there is good reason to think that transmission could be ongoing between species in this setting. I think it's a good example of using models to guide our field work. Given that we can deliver within current resources, I think it's worth a try. If we don't find anything, we can't say much. But, if we do find something, it could be really interesting.

Our questions for you:

1. Raina, are you supportive of using our resources for this endeavor?
2. Vincent, are you willing to receive and test these additional urine specimens?

Best,  
Emily

**From:** Schountz, Tony  
**Sent:** Tue, 3 Sep 2019 15:57:36 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Cc:** Kendall, Lon; Cisar, Alpie (NIH/OD/ORS) [E]; Clifton, Dawn (NIH/NIAID) [E]  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Vinnie, Lon's info is what we used, too, when we justified getting our bats. We're not attempting to do anything that's not already been done before. I think you have a compelling case to make with the Miami Zoo.

I'm heading to a meeting, then to teach all afternoon. I'm traveling tomorrow through Friday and will have limited email access.

T.

—  
Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692  
(b) (6)  
(b) (6)

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**From:** "Kendall, Lon" <(b) (6)>  
**Date:** Tuesday, September 3, 2019 at 9:53 AM  
**To:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)> "Cisar, Alpie (NIH/OD/ORS) [E]" <(b) (6)> "Schountz, Tony" <(b) (6)> "Clifton, Dawn (NIH/NIAID) [E]" <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Not sure if it helps, but this is directly from the AZA White Paper on AZA Research Priorities. Seems what you do fits within both of these niches, with the addition of human health.

Animal Health: The protection and promotion of animal health is the foundation of good animal care, yet detecting disease is notoriously difficult in exotic animals. Scientific studies of animal health can identify symptoms of illness, test diagnostic tools, or reveal causative factors that threaten the health of individuals or populations.

AND

Wildlife Health Emerging diseases, such as avian flu and Ebola, have caused significant mortality to animals in their natural habitats and pose serious threats to a number of wildlife populations. Though disease-related mortality is a natural phenomenon, growing human populations mean that disease processes often have substantially greater impacts than they did in the past. Professionals within AZA have extensive veterinary and epidemiological expertise that can be applied to studies of wildlife health and used to formulate appropriate medical interventions

in a wildlife conservation context. In particular, progressively increasing human influence on wildlife habitats means that the threats posed by disease transfer from humans and livestock to wild animals will require greater levels of both veterinary management and human health initiatives.

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496  
(b) (6)

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**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Tuesday, September 3, 2019 9:34 AM  
**To:** Kendall, Lon <(b) (6)> Cisar, Alphie (NIH/OD/ORS) [E] <(b) (6)>  
Schountz, Tony <(b) (6)> Clifton, Dawn (NIH/NIAID) [E] <(b) (6)>  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Hi Tony and Lon,

As kind of expected the bat situation hit a snag (from the Miami end). Apparently their Zoo accreditation will make it very unlikely to share bats with us. It directly stipulates that they cannot share bats for experimental research or for starting breeding colonies for research purposes. We are till waiting for the final no from their end.

Although this is obviously very disappointing given the time and effort put into this, I would like to use this to expand the breeding of Tony's Artibeus and go ahead with all the contracts which are in process.

Let me know what you guys think and whether there are enough bats to occupy a second breeding room,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



**From:** Plowright, Raina  
**Sent:** Tue, 27 Aug 2019 21:37:45 +0000  
**To:** Letko, Michael (NIH/NIAID) [F]  
**Cc:** Kevin Olival; Munster, Vincent (NIH/NIAID) [E]; Seifert, Stephanie (NIH/NIAID) [F]  
**Subject:** Re: Nature Reviews Microbiology manuscript draft

Brilliant! I look forward to reading.  
Raina

On Aug 27, 2019, at 2:11 PM, Letko, Michael (NIH/NIAID) [F] <[REDACTED]> (b) (6) wrote:

Dear co-authors,

Attached is our draft of the bat-virus manuscript for Nature Reviews Microbiology. Please take a look at the manuscript and make changes wherever you see fit. If you want to include any references, just paste the PMID where you want and we will add them in through EndNote.

Ideally, we would like to submit the finalized manuscript to the editors sometime in the 3<sup>rd</sup> or 4<sup>th</sup> week of September (around 16<sup>th</sup>-27<sup>th</sup>).

**In general, our review briefs through several contemporary areas of bat-virus research, then highlights the knowledge gaps in those areas and poses ways to address them.** This larger scope and forward-thinking perspective is where our review is different from other bat-virus reviews. There are 3 sections:

- a. Lines 20-41: **Ecology section/box** (the editors suggested we keep it shorter but it could still use some expansion)
- b. Lines 47-273 **Molecular section** (species barriers and immunity)
  - a. With a figure of the types of cellular species barriers viruses must overcome
  - b. followed by a **box on bat-animal models** (lines 278-290)
- c. Lines 301-422: **Virus surveillance and one health section**
  - a. With a figure on the future of virus discovery
  - b. Followed by a **box on the future of bat virus research** (lines 428-459)
    - i. Alternatively, we can form this box into a conclusion paragraph, which also fits

**In general, the current manuscript will benefit from the following:**

1. Preferably from the senior authors (Kevin, Raina, Vincent): broad-strokes statements in the introduction and conclusion, to help contextualize within the field.
2. More bat-virus-specific examples, where necessary
3. Transition statements to help link core concepts

4. Additional figures if you can think of any. We have 2 right now and 2 or 3 boxes, but most of the editor's ideas did not make sense (like a phylogenetic tree of all viruses) or have been done a thousand times over by every other review (factors influencing spillover).

Let us know if you have any questions or issues. It has been a team effort and we are excited to finally close in on submitting this review!

We look forward to your additions and changes!

Best,  
-michael

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)  
(b) (6)

<NRM DRAFT 8\_27\_19.docx>

**From:** Letko, Michael (NIH/NIAID) [F]  
**Sent:** Tue, 27 Aug 2019 20:11:38 +0000  
**To:** Plowright, Raina; Kevin Olival  
**Cc:** Munster, Vincent (NIH/NIAID) [E]; Seifert, Stephanie (NIH/NIAID) [F]  
**Subject:** Nature Reviews Microbiology manuscript draft  
**Attachments:** NRM DRAFT 8\_27\_19.docx

Dear co-authors,

Attached is our draft of the bat-virus manuscript for Nature Reviews Microbiology. Please take a look at the manuscript and make changes wherever you see fit. If you want to include any references, just paste the PMID where you want and we will add them in through EndNote.

Ideally, we would like to submit the finalized manuscript to the editors sometime in the 3<sup>rd</sup> or 4<sup>th</sup> week of September (around 16<sup>th</sup>-27<sup>th</sup>).

**In general, our review briefs through several contemporary areas of bat-virus research, then highlights the knowledge gaps in those areas and poses ways to address them.** This larger scope and forward-thinking perspective is where our review is different from other bat-virus reviews. There are 3 sections:

- a. Lines 20-41: **Ecology section/box** (the editors suggested we keep it shorter but it could still use some expansion)
- b. Lines 47-273 **Molecular section** (species barriers and immunity)
  - a. With a figure of the types of cellular species barriers viruses must overcome
  - b. followed by a **box on bat-animal models** (lines 278-290)
- c. Lines 301-422: **Virus surveillance and one health section**
  - a. With a figure on the future of virus discovery
  - b. Followed by a **box on the future of bat virus research** (lines 428-459)
    - i. Alternatively, we can form this box into a conclusion paragraph, which also fits

**In general, the current manuscript will benefit from the following:**

1. Preferably from the senior authors (Kevin, Raina, Vincent): broad-strokes statements in the introduction and conclusion, to help contextualize within the field.
2. More bat-virus-specific examples, where necessary
3. Transition statements to help link core concepts
4. Additional figures if you can think of any. We have 2 right now and 2 or 3 boxes, but most of the editor's ideas did not make sense (like a phylogenetic tree of all viruses) or have been done a thousand times over by every other review (factors influencing spillover).

Let us know if you have any questions or issues. It has been a team effort and we are excited to finally close in on submitting this review!

We look forward to your additions and changes!

Best,  
-michael

--

Michael Letko, Ph.D  
Postdoctoral IRTA  
Dr. Vincent Munster Laboratory  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH  
[903S 4th Street](#)  
[Hamilton MT 59840](#)

(b) (6)

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(b) (4), (b) (5), (b) (6)

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(b) (4), (b) (5), (b) (6)

(b) (4), (b) (5), (b) (6)

(b) (4), (b) (5), (b) (6)

**From:** Plowright, Raina  
**Sent:** Wed, 21 Aug 2019 20:55:53 +0000  
**To:** Kwe Claude, Yinda (NIH/NIAID) [F]  
**Cc:** Alison Peel; Bushmaker, Trenton (NIH/NIAID) [E]; Fischer, Robert (NIH/NIAID) [F]; Munster, Vincent (NIH/NIAID) [E]; (b) (6)  
**Subject:** Re: Exciting results

(b) (4) CAN'T wait to find out which populations!  
Thanks Kwe, Trent, Bob, Vincent and all of your team as I know you have burned the midnight oil to process all of these samples.  
Raina

On Aug 21, 2019, at 2:51 PM, Kwe Claude, Yinda (NIH/NIAID) [F]  
(b) (6) wrote:

Hello Ali,

(b) (4)

Thanks  
Kwe

---

**From:** Alison Peel (b) (6)  
**Date:** Wednesday, August 21, 2019 at 2:32 PM  
**To:** "Kwe Claude, Yinda (NIH/NIAID) [F]" (b) (6), "Plowright, Raina" (b) (6), "Bushmaker, Trenton (NIH/NIAID) [E]" (b) (6), "Fischer, Robert (NIH/NIAID) [F]" (b) (6)  
**Cc:** "Munster, Vincent (NIH/NIAID) [E]" (b) (6), (b) (6) (b) (6)  
(b) (6)  
**Subject:** Re: Exciting results

Thanks Kwe! This is exciting! We'll take a look at the sample details today.

To enable us to interpret this data, can you please send me the list of samples that were tested and were negative? We will need that data to populate our database.

Also, I'm interested to understand more about the testing process (I often get questions about this) - can you please describe what the different assay that was used to confirm results is? Thanks!

Ali

---

**From:** Kwe Claude, Yinda (NIH/NIAID) [F] (b) (6)  
**Sent:** Thursday, August 22, 2019 2:08:05 AM  
**To:** Plowright, Raina (b) (6); Alison Peel (b) (6);  
Bushmaker, Trenton (NIH/NIAID) [E] (b) (6); Fischer, Robert (NIH/NIAID) [F]  
(b) (6)  
**Cc:** Munster, Vincent (NIH/NIAID) [E] (b) (6)  
**Subject:** Exciting results

Dear all,

(b) (4)

Let me know if you have questions

Kwe

--

Kwe Claude Yinda, PhD  
Postdoc Fellow  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories, NIAID/NIH  
903S 4th St. Hamilton, MT 59840  
**Email:** (b) (6)  
**Tel:** (b) (6)

<List of samples screened.xlsx>

**From:** Plowright, Raina  
**Sent:** Wed, 21 Aug 2019 16:18:23 +0000  
**To:** Kwe Claude, Yinda (NIH/NIAID) [F]  
**Cc:** Alison Peel; Bushmaker, Trenton (NIH/NIAID) [E]; Fischer, Robert (NIH/NIAID) [F]; Munster, Vincent (NIH/NIAID) [E]  
**Subject:** Re: Exciting results

Wonderful news! Thanks for sharing. We are looking forward to analyzing the data to see where those positives came from!!

Sent from my iPhone

On Aug 21, 2019, at 10:10 AM, Kwe Claude, Yinda (NIH/NIAID) [F]

(b) (6) wrote:

Dear all,

(b) (4)

Let me know if you have questions

Kwe

--

Kwe Claude Yinda, PhD  
Postdoc Fellow  
Virus Ecology Unit, Laboratory of Virology  
Rocky Mountain Laboratories, NIAID/NIH  
903S 4th St. Hamilton, MT 59840  
Email: (b) (6)  
Tel: (b) (6)

<Positives.xlsx>



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Thu, 15 Aug 2019 08:00:17 -0600  
**To:** Rasmussen, Angela L.  
**Subject:** Re: Late September?

(b) (6)

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Angie Rasmussen (b) (6)  
**Date:** Monday, August 12, 2019 at 7:56 AM  
**To:** (b) (6)  
**Subject:** Late September?

Hi Vincent,

Hope all is well. Any chance you'll be in (b) (6) are coordinating a visit but we want to make sure everyone we need to meet with is around. I was thinking I'd make a (b) (6)

Cheers,  
Angie

**From:** Plowright, Raina  
**Sent:** Tue, 13 Aug 2019 21:46:52 +0000  
**To:** Munster, Vincent (NIH/NIAID) [E]  
**Cc:** LaTrielle, Sara  
**Subject:** Re: Trip

No worries. We will try to avoid TA2 questions for the agenda and may focus on this on our next monthly call.

(b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" (b) (6)  
**Date:** Tuesday, August 13, 2019 at 12:51 PM  
**To:** "Plowright, Raina" (b) (6)  
**Cc:** "LaTrielle, Sara" (b) (6)  
**Subject:** Re: Trip

I'll actually be (b) (6)

We could recap after I come back and see whether they would like an update

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Plowright, Raina" (b) (6)  
**Date:** Tuesday, August 13, 2019 at 10:42 AM  
**To:** (b) (6)  
**Cc:** "LaTrielle, Sara" (b) (6)  
**Subject:** Fwd: Trip

Can you be available to zoom in to this mtg to discuss vaccination?

Sent from my iPhone

Begin forwarded message:

**From:** (b) (6)  
**Date:** August 13, 2019 at 12:30:20 PM EDT  
**To:** "LaTrielle, Sara" (b) (6)  
**Cc:** (b) (6), "Plowright, Raina" (b) (6)  
**Subject:** RE: Trip

Hi Sara,

Thank you. Could you put together an agenda based on the below draft:

August 23:

9:00 -noon

- Overview of the MSU team and subs (including students/postdocs, field collaborators, modelers, etc.)
- Approach for TA1 - explain modelling approaches, in particular percolation model
- Approach for TA2 (explain more both vaccine and ecologic enhancements)
- Update on recent data for both TA1 and TA2.

12:00

Lunch - We are thinking a 3 hours meeting and then go to lunch, but if you think it might take longer, then we can continue during a working lunch.

1:00

- tour of labs and others

2:00-2:30pm

- Final recap with team describing goals, milestones and metrics for the next year.
- Discuss possible Phase I demo.

Thanks.

-----  
(b) (6)

Support to Biological Technologies Office, DARPA  
Science and Technology Associates, Inc.

(b) (6)

-----Original Message-----

From: LaTrielle, Sara (b) (6)

Sent: Thursday, August 8, 2019 11:59 AM

To: (b) (6)

Subject: Re: Trip

(b) (6)

The MSU campus is a 5-7 minute drive from downtown. We can transport Amy as needed. Here are a few hotels in downtown Bozeman; The Element, The Lewis and Clark Motel or The Lark.

Sara

---

From: [REDACTED] (b) (6)  
Sent: Thursday, August 8, 2019 9:51 AM  
To: LaTrielle, Sara [REDACTED] (b) (6)  
Subject: Trip

Hi Sara,  
I'm working on a potential agenda to send to you. Is there a hotel nearby MSU that you can recommend?  
Thanks.

---

[REDACTED] (b) (6)  
Support to Biological Technologies Office, DARPA Science and Technology Associates, Inc.  
[REDACTED] (b) (6)

-----Original Message-----

From: [REDACTED] (b) (6)  
Sent: Wednesday, August 7, 2019 8:55 PM  
To: LaTrielle, Sara [REDACTED] (b) (6)  
Cc: Plowright, Raina [REDACTED] (b) (6); [REDACTED] (b) (6); [REDACTED] (b) (6)  
Subject: RE: D18AC00031\_ MSU June Monthly report

Hi Sara,

August is flying by already, [REDACTED] (b) (6) will be reaching out to discuss details on the visit on the 23rd. Looking forward to seeing the Montana State team in person!

Best,  
[REDACTED] (b) (6)

-----Original Message-----

From: LaTrielle, Sara (b) (6)  
Sent: Friday, July 19, 2019 11:54 AM  
To: (b) (6)  
Cc: Plowright, Raina (b) (6); (b) (6)  
Subject: Re: D18AC00031\_ MSU June Monthly report

(b) (6)

The morning of the 23rd works for us. Looking forward to it.

Best,  
Sara

Get Outlook for iOS <hxxps://aka.ms/o0ukef>

---

From: (b) (6)  
Sent: Monday, July 15, 2019 6:28:42 AM  
To: LaTrielle, Sara (b) (6)  
Cc: Plowright, Raina (b) (6); (b) (6)  
(b) (6)  
Subject: RE: D18AC00031\_ MSU June Monthly report

Hi Sara,

My schedule has solidified. I can meet on either the afternoon of the 22nd or the morning of the 23rd. The 23rd is slightly better. Once we nail down a date we can discuss the timing and agenda. Thanks!

(b) (6)

-----Original Message-----

From: LaTrielle, Sara (b) (6)  
Sent: Friday, July 12, 2019 1:49 PM  
To: (b) (6)  
Cc: Plowright, Raina (b) (6); (b) (6)  
Subject: Re: D18AC00031\_ MSU June Monthly report

(b) (6)

Absolutely- it would be great to welcome you to Montana/MSU Aug 22 or 23rd. Let us know what works best for you, how much time you have and any

particular part of the project you would like to discuss or hear more about. We look forward to welcoming you to the Rockies.

Best,

Sara LaTrielle

Program Manager  
PREEMPT Project  
Montana State University

(b) (6)

---

From: (b) (6)  
Sent: Friday, July 12, 2019 9:00:25 AM  
To: LaTrielle, Sara  
Subject: RE: D18AC00031\_ MSU June Monthly report

Hi Sara,

Thank you for sending. Additionally, one quick question for you. I will be in the area at the end of August and was considering stopping by. Will you and Raina and the team be there on Aug. 22 or 23rd? Thanks!

(b) (6)

-----Original Message-----

From: LaTrielle, Sara (b) (6)  
Sent: Thursday, July 11, 2019 4:06 PM  
To: (b) (6)  
Cc: (b) (6), (b) (6)  
(b) (6); (b) (6)  
(b) (6); (b) (6)  
(b) (6); (b) (6)  
(b) (6)

(b) (6); (b) (6)

; Plowright, Raina

(b) (6); (b) (6); (b) (6)

Subject: D18AC00031\_ MSU June Monthly report

(b) (6)

Please find MSU's June 2019 monthly report attached. We look forward to our monthly call with you and your team tomorrow.

Please kindly note, as Raina will be in flight during our call, Barbara Han (PI, Cary) and Pete Hudson (Co-PI for the project, PSU) will present our June monthly progress update.

Best,

Sara LaTrielle

Program Manager  
PREEMPT Project  
Montana State University

(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Fri, 9 Aug 2019 15:58:32 -0600  
**To:** Kwe Claude, Yinda (NIH/NIAID) [F]; Rynda-Apple, Agnieszka; Plowright, Raina; Benson, Evelyn; Dan Crowley; Bushmaker, Trenton (NIH/NIAID) [E]  
**Subject:** Re: <no subject>

We'll extract them, and send the RNA to boseman

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Kwe Claude, Yinda (NIH/NIAID) [F]" (b) (6)  
**Date:** Friday, August 9, 2019 at 3:19 PM  
**To:** (b) (6), "Rynda-Apple, Agnieszka"  
(b) (6), "Plowright, Raina" (b) (6),  
"Benson, Evelyn" (b) (6), Dan Crowley (b) (6),  
Trenton Bushmaker (b) (6)  
**Subject:** RE: <no subject>

Yes, about 60 samples.

---

**From:** Munster, Vincent (NIH/NIAID) [E] (b) (6)  
**Sent:** Friday, August 9, 2019 3:08 PM  
**To:** Rynda-Apple, Agnieszka (b) (6); Plowright, Raina  
(b) (6); Benson, Evelyn (b) (6); Dan Crowley  
(b) (6); Kwe Claude, Yinda (NIH/NIAID) [F] (b) (6);  
Bushmaker, Trenton (NIH/NIAID) [E] (b) (6)  
**Subject:** Re: <no subject>

Kwe,

Do you know if there was any blood in RNA protect in the shipments from Australia?

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



---

**From:** "Rynda-Apple, Agnieszka" (b) (6)  
**Date:** Friday, August 9, 2019 at 2:00 PM  
**To:** (b) (6), "Plowright, Raina"  
(b) (6), "Benson, Evelyn" (b) (6), Dan  
Crowley (b) (6)  
**Subject:** FW: <no subject>

Hi Vincent,  
I consulted with Evelyn and she also does not have any more info over what I provided regarding the samples. Per Evelyn's email below, she will work with Dan Crowley next week to help figure this out.

Aga

---

**From:** "Benson, Evelyn" (b) (6)  
**Date:** Friday, August 9, 2019 at 1:52 PM  
**To:** "Rynda-Apple, Agnieszka" (b) (6)  
**Subject:** Re: <no subject>

Hi Aga,

I do not recall any more information on these samples.

I will get in touch with Dan Crowley next week when he is back from vacation. He has been working on the Sample Data Input Summaries so he would have the most up to date information.

I have seen spreadsheets on BOX but most of them are urine, feces and serum. No mention of RNAprotect blood unless I just didn't see it.

I will put this on the top of my list next week to figure out which samples are available for shipment to us.

Thanks and have a great vacation!

Best,  
Evelyn

---

**From:** Rynda-Apple, Agnieszka (b) (6)  
**Sent:** Thursday, August 8, 2019 3:53 PM  
**To:** Benson, Evelyn (b) (6)  
**Subject:** FW: <no subject>

Hi Evelyn,

Do you recall any more information about these samples than the fact that they were blood and came from Australian bats around may?

Please see Vincent's email below....

---

Agnieszka Rynda-Apple, Ph.D.  
Assistant Professor  
Department of Microbiology & Immunology  
Montana State University

Email: [REDACTED] (b) (6)

Phone: [REDACTED] (b) (6)

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" [REDACTED] (b) (6)  
**Date:** Thursday, August 8, 2019 at 3:30 PM  
**To:** "Rynda-Apple, Agnieszka" [REDACTED] (b) (6)  
**Subject:** Re: <no subject>

Hi Aga,

Remind me again which samples these would be. We have predominantly focused at screening the samples send to us, but I assume they send us whole blood then too?

I can discuss with my team when would be the way forward (as I'm pretty sure they haven't been extracted yet).

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Rynda-Apple, Agnieszka" [REDACTED] (b) (6)  
**Date:** Thursday, August 8, 2019 at 1:57 PM  
**To:** "[REDACTED]" [REDACTED] (b) (6)  
**Subject:** <no subject>

Hi Vincent,

I hope that you are having a nice summer. Sorry I haven't been in touch in the last month or so, it's been a busy summer here as I'm sure it is also at RML. Anyway, will be traveling until the 20<sup>th</sup> with very limited internet access, and I wanted to touch base with you before I leave this weekend about when do you foresee having RNA samples (from May's Australian shipment) ready to ship to us for the PCR analysis.

Thanks and have a nice rest of your week!

Aga

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Thu, 8 Aug 2019 15:38:04 -0600  
**To:** Laing, Eric; (b) (6); Broder, Chris (USU-DoD); Seifert, Stephanie (NIH/NIAID) [F]  
**Subject:** Re: GHERI\_AFRICOM

Hi Eric,

That sounds pretty good. For the sequencing we could generate cDNA (or any other prep) in country (which would alleviate any shipping issues) and then NGS in the US.

Likely we will have way more serological hits than sequence hits (so we probably should expand to do henipa's too). Samples would be a variety of bat species (we'll likely target some additional species besides the longitudinal study Stephanie is conducting). The type of samples would be RNA extracted from whole blood, nose, throat, urogenital and rectal swabs.

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Eric Laing (b) (6)  
**Date:** Thursday, August 8, 2019 at 11:35 AM  
**To:** (b) (6), "Broder, Chris (USU-DoD)" (b) (6), (b) (6), (b) (6), "Seifert, Stephanie (NIH/NIAID) [F]" (b) (6)  
**Subject:** Re: GHERI\_AFRICOM

Hi everyone,

Just wanted to follow up.

Kim and I can prepare subaward budgets for serology and sequencing. It would be helpful if we had an idea of the sample size we can propose to estimate costs.

For serology, I'd propose installing a MAGPIX at a partner lab and run the sera samples in country.

For sequencing, should we proposed to do PCR in country then NGS on positives at NMRC? What type of samples would we collect for sequencing.

I'll write a boiler plate technical summary with places for Vincent to add the country partners and stakeholders.

- Eric

On Wed, Jul 31, 2019 at 12:27 AM Laing, Eric (b) (6) wrote:  
Hi all,

Here's a draft white paper for the GHERI submission packet. I've also attached the FY19 call. Feedback of the aims at this stage would be appreciated and any identification of partner nation stakeholders/roles/current capacity/logistical feasibility will aid in developing the technical summary.

Best regards,  
Eric

Eric D. Laing, Ph.D.  
Research Assistant Professor  
Department of Microbiology and Immunology  
Uniformed Services University  
4301 Jones Bridge Road  
Bethesda, MD 20814  
cell: (b) (6)  
office: (b) (6)  
lab: (b) (6)

(b) (6)

--

Eric D. Laing, Ph.D.  
Research Assistant Professor  
Department of Microbiology and Immunology  
Uniformed Services University  
4301 Jones Bridge Road  
Bethesda, MD 20814  
cell: (b) (6)  
office: (b) (6)  
lab: (b) (6)

(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Thu, 8 Aug 2019 09:43:15 -0600  
**To:** Kendall,Lon; Cisar, Alphonse (NIH/OD/ORS) [E]  
**Cc:** Schountz, Tony  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat ) EMAIL TIME OUT

Perfect, great that everything is moving along

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Lon Kendall (b) (6)  
**Date:** Thursday, August 8, 2019 at 9:34 AM  
**To:** "Cisar, Alphonse (NIH/OD/ORS) [E]" (b) (6)  
**Cc:** Tony Schountz (b) (6), (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat ) EMAIL TIME OUT

Alf,

We got the CPW permit to import the bats. I just need a vet inspection from the zoo to get the ok from the CO state vet to ship.

Then we are just waiting to finalize the contract with NIAID with CSU.

Ok for me to contact the zoo to get the vet inspection. It's good for 30 days, so we'll need to time the facility upgrades to the import.

Lon

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: (b) (6)  
(b) (6)



---

**From:** Cisar, Alpie (NIH/OD/ORS) [E] (b) (6)  
**Sent:** Thursday, August 1, 2019 2:10 PM  
**To:** LaCasse, Rachel (NIH/NIAID) [E] (b) (6); Watkins Rogers, Rachel (MDPR) (b) (6); Munster, Vincent (NIH/NIAID) [E] (b) (6); Kendall, Lon (b) (6); Schountz, Tony (b) (6); Adams, Michelle (b) (6); Keenan, Heather (MDPR) (b) (6); Svoke, Joseph (MDPR) (b) (6); Traverse, James (MDPR) (b) (6); Bezjian, Marisa (MDPR) (b) (6); Myers, Gwen (MDPR) (b) (6); Clifton, Dawn (NIH/NIAID) [E] (b) (6); Feldmann, Heinrich (NIH/NIAID) [E] (b) (6); Fischer, Robert (NIH/NIAID) [F] (b) (6)  
**Cc:** Scott, Dana (NIH/NIAID) [E] (b) (6); Elkins, Randy (NIH/NIAID) [E] (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat ) EMAIL TIME OUT

Good afternoon everyone, lets hold up on the flow of emails regarding the bats for the moment. As Rachel noted below there is some misinformation in this email chain. After discussing with Rachel as well as Dr. Elkins, the NIAID animal program director, it will be much more efficient for everyone to focus the discussions and flow of information, regarding the bats transfer, through a central government POC. I'll serve as that conduit for this information. This will minimize confusion, misinformation and make this process much more manageable.

I ask that information from the three entities (RML, CSU and Miami) be sent to me and not include individuals in the other groups. It's certainly fine to include critical folks with in you organization as needed, just not everyone from the other organizations. As I receive information, questions, answers or pertinent updates, I will respond to your group accordingly.

Please let me know if you have any outstanding questions at this time.  
Thanks for your understanding.  
Alf

Alpie Cisar, LATG ☐  
NHP & Large Animal Procurement Specialist and Resource Manager  
DVR, ORS  
NIH Animal Center  
Ph: (b) (6)  
Fax 301-480-0644

---

**From:** LaCasse, Rachel (NIH/NIAID) [E]  
**Sent:** Thursday, August 1, 2019 1:40 PM  
**To:** Watkins Rogers, Rachel (MDPR) (b) (6); Munster, Vincent (NIH/NIAID) [E] (b) (6); Kendall, Lon (b) (6); Schountz, Tony (b) (6); Adams, Michelle (b) (6); Cisar, Alpie (NIH/OD/ORS) [E] (b) (6); Keenan, Heather (MDPR) (b) (6)

Svoke, Joseph (MDPR) (b) (6); Traverse, James (MDPR) (b) (6); Bezjian, Marisa (MDPR) (b) (6); Myers, Gwen (MDPR) (b) (6); Clifton, Dawn (NIH/NIAID) [E] (b) (6); Feldmann, Heinrich (NIH/NIAID) [E] (b) (6); Fischer, Robert (NIH/NIAID) [F] (b) (6)

**Cc:** Scott, Dana (NIH/NIAID) [E] (b) (6)

**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Hello All,

I think there might be a misunderstanding, as RML only has holding room for approximately 60 female bats, so unfortunately we would not be able to house the bats that are slated to go to CO. Please feel free to contact me at any time if there are any questions/concerns.

Thanks so much for all of your help,  
Rachel

Rachel A. LaCasse, Ph.D., CMAR, RLATG  
Animal Program Administrator  
Rocky Mountain Veterinary Branch  
Rocky Mountain Laboratories, NIAID, NIH  
903 South 4<sup>th</sup> St.  
Hamilton, MT 59840  
Phone: (b) (6)  
Cell: (b) (6)  
Email: (b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) (b) (6)  
**Sent:** Wednesday, July 31, 2019 3:20 PM  
**To:** Munster, Vincent (NIH/NIAID) [E] (b) (6); Kendall, Lon (b) (6); Schountz, Tony (b) (6); Adams, Michelle (b) (6); LaCasse, Rachel (NIH/NIAID) [E] (b) (6); Cisar, Alphie (NIH/OD/ORS) [E] (b) (6); Keenan, Heather (MDPR) (b) (6); Svoke, Joseph (MDPR) (b) (6); Traverse, James (MDPR) (b) (6); Bezjian, Marisa (MDPR) (b) (6); Myers, Gwen (MDPR) (b) (6); Clifton, Dawn (NIH/NIAID) [E] (b) (6); Feldmann, Heinrich (NIH/NIAID) [E] (b) (6); Fischer, Robert (NIH/NIAID) [F] (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Thank you!

Please consult with Alphie, so we can coordinate this information. I understand there is a delay in CO due to construction needs and Alphie indicated we could send them all to MT and that CO could p/u from MT. We still need #s of how many bats. Please add the missing information to the attached application and return it to me for follow-up.



Thank you for your help, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Munster, Vincent (NIH/NIAID) [E] (b) (6)  
**Sent:** Wednesday, July 31, 2019 4:58 PM  
**To:** Watkins Rogers, Rachel (MDPR) (b) (6); Kendall, Lon (b) (6); Schountz, Tony (b) (6); Adams, Michelle (b) (6); LaCasse, Rachel (NIH/NIAID) [E] (b) (6); Cisar, Alphonse (NIH/OD/ORS) [E] (b) (6); Keenan, Heather (MDPR) (b) (6); Svoke, Joseph (MDPR) (b) (6); Traverse, James (MDPR) (b) (6); Bezjian, Marisa (MDPR) (b) (6); Myers, Gwen (MDPR) (b) (6); Clifton, Dawn (NIH/NIAID) [E] (b) (6); Feldmann, Heinrich (NIH/NIAID) [E] (b) (6); Fischer, Robert (NIH/NIAID) [F] (b) (6)  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )  
**Importance:** High

EMAIL RECEIVED FROM EXTERNAL SOURCE.

Hi Rachel,

I have added Dr. bob Fischer to the conversation who is the permit specialist from our end and would be able to help us further asap,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

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**From:** "Watkins Rogers, Rachel (MDPR)" (b) (6)  
**Date:** Wednesday, July 31, 2019 at 2:49 PM  
**To:** (b) (6), Lon Kendall (b) (6), Tony Schountz (b) (6), "Adams, Michelle" (b) (6), "LaCasse, Rachel (NIH/NIAID) [E]" (b) (6), "Cisar, Alphonse (NIH/OD/ORS) [E]" (b) (6), "Keenan, Heather (MDPR)" (b) (6), "Svoke, Joseph (MDPR)" (b) (6), "Traverse, James (MDPR)" (b) (6), "Bezjian, Marisa (MDPR)" (b) (6), "Myers, Gwen (MDPR)" (b) (6), "Clifton, Dawn (NIH/NIAID) [E]" (b) (6), Heinrich Feldmann

< (b) (6) >

**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good afternoon Lon and Vincent,

I am currently working with Alphie on the shipping containers, CDC permit application, and numbers of bats which we currently do not have yet.

- I cannot complete the CDC permit until I have the count of bats.
- I will be off Thursday and Friday this week, returning on Saturday.
- This is the application with the rest of the needed information if you wish to provide it to me ([https://www.cdc.gov/cpr/ipp/forms/permit\\_to\\_import\\_or\\_transport\\_live\\_bats.pdf](https://www.cdc.gov/cpr/ipp/forms/permit_to_import_or_transport_live_bats.pdf)).

I appreciate your help!

Thank you, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Munster, Vincent (NIH/NIAID) [E] [[\(mailto:\(b\) \(6\)](mailto:(b) (6)))]

**Sent:** Wednesday, July 31, 2019 4:09 PM

**To:** Kendall, Lon <(b) (6)> Watkins Rogers, Rachel (MDPR)

<(b) (6)> Schountz, Tony <(b) (6)> Adams, Michelle

<(b) (6)> LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Cisar,

Alphie (NIH/OD/ORS) [E] <(b) (6)> Keenan, Heather (MDPR)

<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,

James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)

<(b) (6)> Myers, Gwen (MDPR) <(b) (6)> Clifton,

Dawn (NIH/NIAID) [E] <(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E]

<(b) (6)>

**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.

Sounds good,

Fingers crossed the permits will be issued asap,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Lon Kendall < (b) (6) >  
**Date:** Wednesday, July 31, 2019 at 1:30 PM  
**To:** "Watkins Rogers, Rachel (MDPR)" < (b) (6) > Tony Schountz  
< (b) (6) > "Adams,Michelle" < (b) (6) >  
"LaCasse, Rachel (NIH/NIAID) [E]" < (b) (6) > "Cisar, Alphonse (NIH/OD/ORS) [E]"  
< (b) (6) > "Keenan, Heather (MDPR)" < (b) (6) > "Svoke, Joseph (MDPR)"  
< (b) (6) > "Traverse, James (MDPR)"  
< (b) (6) > "Bezjian, Marisa (MDPR)"  
< (b) (6) > "Myers, Gwen (MDPR)" < (b) (6) >  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

I'm just awaiting a permit from Colorado Parks and Wildlife. Once I get that we can discuss shipping. They said it would take 3-4 weeks.

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496  
(b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) < (b) (6) >  
**Sent:** Monday, July 22, 2019 1:40 PM  
**To:** Kendall,Lon (b) (6); Schountz,Tony (b) (6);  
Adams,Michelle < (b) (6) > LaCasse, Rachel (NIH/NIAID) [E]  
< (b) (6) > Cisar, Alphonse (NIH/OD/ORS) [E] (b) (6) Munster, Vincent  
(NIH/NIAID) [E] < (b) (6) > Keenan, Heather (MDPR)  
< (b) (6) > Svoke, Joseph (MDPR) < (b) (6) > Traverse,  
James (MDPR) < (b) (6) > Bezjian, Marisa (MDPR)  
< (b) (6) > Myers, Gwen (MDPR) < (b) (6) >  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Thank you Lon,

I will wait to hear from you and can start this ePermit tomorrow or Friday.

Thank you, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Kendall, Lon [mailto: (b) (6)]  
**Sent:** Monday, July 22, 2019 3:38 PM  
**To:** Watkins Rogers, Rachel (MDPR) < (b) (6) Schountz, Tony  
< (b) (6) Adams, Michelle < (b) (6) LaCasse, Rachel  
(NIH/NIAID) [E] < (b) (6) Cisar, Alpie (NIH/OD/ORS) [E] < (b) (6)  
Munster, Vincent (NIH/NIAID) [E] < (b) (6) Keenan, Heather (MDPR)  
< (b) (6) Svoke, Joseph (MDPR) < (b) (6) Traverse,  
James (MDPR) < (b) (6) Bezjian, Marisa (MDPR)  
< (b) (6) Myers, Gwen (MDPR) < (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.

It would be mixed. I'd need to get with Tony and Vincent to see what ratio they would like. My guess is more females than males. 4-5:1.

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496  
(b) (6)

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**From:** Watkins Rogers, Rachel (MDPR) < (b) (6)  
**Sent:** Monday, July 22, 2019 1:36 PM  
**To:** Kendall, Lon < (b) (6) Schountz, Tony < (b) (6)  
Adams, Michelle < (b) (6) LaCasse, Rachel (NIH/NIAID) [E]  
< (b) (6) Cisar, Alpie (NIH/OD/ORS) [E] < (b) (6) Munster, Vincent  
(NIH/NIAID) [E] < (b) (6) Keenan, Heather (MDPR)  
< (b) (6) Svoke, Joseph (MDPR) < (b) (6) Traverse,  
James (MDPR) < (b) (6) Bezjian, Marisa (MDPR)  
< (b) (6) Myers, Gwen (MDPR) < (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Excellent Lon,

I will start the ePermit on the USDA website. Is that 300 males, females, or a mix of genders?

Thank you, Rachél

**New** Days off: Wednesday/Thursday



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**From:** Kendall, Lon [mailto: (b) (6)]  
**Sent:** Monday, July 22, 2019 3:33 PM  
**To:** Watkins Rogers, Rachel (MDPR) < (b) (6) Schountz, Tony < (b) (6) Adams, Michelle < (b) (6) LaCasse, Rachel (NIH/NIAID) [E] < (b) (6) Cisar, Alpie (NIH/OD/ORS) [E] < (b) (6) Munster, Vincent (NIH/NIAID) [E] < (b) (6) Keenan, Heather (MDPR) < (b) (6) Svoke, Joseph (MDPR) < (b) (6) Traverse, James (MDPR) < (b) (6) Bezjian, Marisa (MDPR) < (b) (6) Myers, Gwen (MDPR) < (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.

We decided I'd sign the documents.

I'm trying to confirm some room information to see how many we can take. It will be close to 300.

Lon

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496  
(b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) < (b) (6)  
**Sent:** Monday, July 22, 2019 1:14 PM  
**To:** Kendall, Lon < (b) (6) Schountz, Tony < (b) (6) Adams, Michelle < (b) (6) LaCasse, Rachel (NIH/NIAID) [E] < (b) (6) Cisar, Alpie (NIH/OD/ORS) [E] < (b) (6) Munster, Vincent (NIH/NIAID) [E] < (b) (6); Keenan, Heather (MDPR) < (b) (6) Svoke, Joseph (MDPR) < (b) (6) Traverse, James (MDPR) < (b) (6) Bezjian, Marisa (MDPR) < (b) (6) Myers, Gwen (MDPR) < (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good afternoon Lon,

I very much appreciate your help. I have attached a copy of our last bat permit and will begin the process once I get a few details.

Questions: Do I use your name to sign the donation or Dr. Schountz? Do you know a count of bats yet for your group transfer to CO?

Thank you for yur help, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Kendall, Lon [mailto: (b) (6)]  
**Sent:** Monday, July 22, 2019 2:25 PM  
**To:** Schountz, Tony < (b) (6) > Adams, Michelle < (b) (6) >  
< (b) (6) > Watkins Rogers, Rachel (MDPR) < (b) (6) >  
LaCasse, Rachel (NIH/NIAID) [E] < (b) (6) > Cisar, Alpie (NIH/OD/ORS) [E]  
< (b) (6) > Munster, Vincent (NIH/NIAID) [E] < (b) (6) > Keenan, Heather  
(MDPR) < (b) (6) > Svoke, Joseph (MDPR) < (b) (6) >  
Traverse, James (MDPR) < (b) (6) > Bezjian, Marisa (MDPR)  
< (b) (6) > Myers, Gwen (MDPR) < (b) (6) >  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.

All,

The physical address for shipment is:  
3185 RAMPART RD.  
FORT COLLINS, CO 80521

Mailing address is  
2007 Campus Delivery  
Fort Collins, CO 80523-2007

Lon

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496  
(b) (6)

---

**From:** Schountz, Tony  
**Sent:** Sunday, July 21, 2019 6:45 AM

**To:** Kendall, Lon <[REDACTED] (b) (6)> Adams, Michelle <[REDACTED] (b) (6)>  
**Subject:** Fw: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Hi Lon and Michelle,

Can you tell us our shipping address for receiving live animals?

Lon, as a reminder, Vincent and I would like to get some of the Carollia bats, too, for a one-time challenge experiment with influenza. I will get on the protocol when I return from ASV this week.

Thanks,

Tony

---

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

[REDACTED] (b) (6)  
[REDACTED] (b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) <[REDACTED] (b) (6)>  
**Sent:** Saturday, July 20, 2019 3:10 PM  
**To:** LaCasse, Rachel (NIH/NIAID) [E] <[REDACTED] (b) (6)> Cisar, Alphie (NIH/OD/ORS) [E] <[REDACTED] (b) (6)> Schountz, Tony <[REDACTED] (b) (6)>  
**Cc:** Traverse, James (MDPR) <[REDACTED] (b) (6)> Bezjian, Marisa (MDPR) <[REDACTED] (b) (6)> Myers, Gwen (MDPR) <[REDACTED] (b) (6)> Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> Keenan, Heather (MDPR) <[REDACTED] (b) (6)> Svoke, Joseph (MDPR) <[REDACTED] (b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good evening Rachel, Alphie, and Dr. Schountz,

We are continuing to work on our 'internal' approval of this transfer and I am working on the donation documents. I have some questions that I could use feedback for to be able to prepare the donations.

- Please provide the 'physical' address the bats will be shipped to and if you also have a mailing address that differs please provide both.
- We assume you wish to be invoiced for the shipment or do you have an account we should use?
- Please provide the name, address, phone, email, fax, and name to be used for the signatory of each (or both) labs.
- Please provide the count or gender ratio of bats you wish to receive. Current inventory of **Artibeus jamaicensis / Jamaican fruit bat is 432.487.0 (919 bats)**

We are very appreciative of your willingness to accept these bats.

Respectfully, Rachél

**Rachél Watkins Rogers**, Zoo Registrar and Records Coordinator

**New Days off: Wednesday/Thursday**

**Zoo Miami** 12400 SW 152 Street, Miami, FL 33177-1499

P: (b) (6); F: [305.378.6381](tel:305.378.6381) / **new** E: (b) (6)

Parks, Recreation and Open Spaces ([miamidade.gov](http://miamidade.gov))

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**From:** Munster, Vincent (NIH/NIAID) [E] [[\(b\) \(6\)](mailto:(b) (6))]

**Sent:** Tuesday, July 09, 2019 11:51 AM

**To:** Watkins Rogers, Rachel (MDPR) <(b) (6)> Myers, Gwen



(MDPR) < [REDACTED] (b) (6) Scott, Dana (NIH/NIAID) [E] < [REDACTED] (b) (6)  
LaCasse, Rachel (NIH/NIAID) [E] < [REDACTED] (b) (6) Schountz, Tony  
< [REDACTED] (b) (6)  
**Cc:** Traverse, James (MDPR) < [REDACTED] (b) (6) Feldmann, Heinrich  
(NIH/NIAID) [E] < [REDACTED] (b) (6) Bushmaker, Trenton (NIH/NIAID) [E]  
< [REDACTED] (b) (6) Cisar, Alphonse (NIH/OD/ORS) [E] < [REDACTED] (b) (6)  
Schountz, Tony < [REDACTED] (b) (6) Bezjian, Marisa (MDPR)  
< [REDACTED] (b) (6) Clifton, Dawn (NIH/NIAID) [E] < [REDACTED] (b) (6)  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )  
**Importance:** High

EMAIL RECEIVED FROM EXTERNAL SOURCE.

Hi Rachel,

From our end Rachel LaCassa and Alphonse Cisar will coordinate the shipment and provide you with the necessary information in terms of location and the coordination of the shipment.

We will be using two different location, one in Hamilton Montana of the NIH and one at Colorado state University. Dr. Tony Schountz will provide you with the necessary information on the housing at Colorado State University,

Kind regards,

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Watkins Rogers, Rachel (MDPR)" <(b) (6)>  
**Date:** Tuesday, July 9, 2019 at 7:12 AM  
**To:** "Myers, Gwen (MDPR)" <(b) (6)> "(b) (6)" <(b) (6)>  
<(b) (6)>  
**Cc:** "Traverse, James (MDPR)" <(b) (6)> Dana Scott <(b) (6)>  
<(b) (6)> Heinrich Feldmann <(b) (6)> Trenton Bushmaker <(b) (6)>  
<(b) (6)> "Cisar, Alphonse (NIH/OD/ORS) [E]" <(b) (6)>  
"LaCasse, Rachel (NIH/NIAID) [E]" <(b) (6)> Tony Schountz <(b) (6)>  
<(b) (6)> "Bezjian, Marisa (MDPR)" <(b) (6)> <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good morning Gwen and Dr. Munster,

I would love to help expedite the processes, but I need some information. We must follow some guidelines for me to prepare the donation form since this is a transaction involving 'live' collection animals.

1. Artibeus jamaicensis / Jamaican fruit bat (**Currently: 433.487.0 = 920 bats**): "~300 – 400 of the Artibeus". **Action item:** Please provide the gender ratio (males : females) for deaccessioning purposes of our inventory.
2. Physical address for shipment. **Action item:** Please provide the physical and mailing address.
3. Contact name and signatory name. **Action item:** Please provide the person's name that is coordinating the shipment to NIH and the person authorizing the acquisition of the bats.
4. Contact and signatory address & contact info. **Action item:** Please provide the phone, fax, email, physical, mailing address of the signatory and coordinator for the purposes of completing this donation.
5. **IMPORTANT:** Do you need any of our permits besides our USDA license and Florida Fish and Wildlife exemption for a Class III permit for these bats?

I appreciate your quick turnaround on getting the needed on the action items above!

Respectfully, Rachél

**Rachél Watkins Rogers**, Zoo Registrar and Records Coordinator

**New Days off: Wednesday/Thursday**

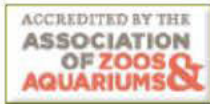
Zoo Miami 12400 SW 152 Street, Miami, FL 33177-1499

P: (b) (6); F: 305.378.6381/ new E: (b) (6)

Parks, Recreation and Open Spaces (miamidade.gov)

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*Miami-Dade County is a public entity subject to Chapter 119 of the Florida Statutes concerning public records. E-mail messages are covered under such laws and thus subject to disclosure.*



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**From:** Myers, Gwen (MDPR)  
**Sent:** Tuesday, July 09, 2019 8:28 AM  
**To:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Bezjian, Marisa (MDPR) <(b) (6)> Watkins Rogers, Rachel (MDPR) <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Scott, Dana (NIH/NIAID) [E] <(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E] <(b) (6)> Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)> Cisar, Alphonse (NIH/OD/ORS) [E] <(b) (6)> LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Schountz, Tony <(b) (6)>  
**Subject:** RE: Bats at zoo miami

Hi Vincent,  
Thank you for getting back to us. We are motivated to move them as soon as possible, but would love to have them shipped out by August 1<sup>st</sup>. If that timeline is going to be difficult, please let us know. The pressure we are feeling to move them is due to the hurricane season – the bat cage they are in would likely not contain them if a hurricane damaged it, and we do not want to be adding more invasives to the South Florida wildlife! Let us know if there is anything we can do to help.  
Thanks,  
Gwen

**Gwen E. Myers, DVM**  
Chief, Animal Health  
Zoo Miami  
12400 SW 152nd St. Miami, FL 33177  
Phone: (b) (6) ext. (b) (6)  
Miami-Dade Co. Parks, Recreation & Open Spaces Dept.  
miamidade.gov

---

**From:** Munster, Vincent (NIH/NIAID) [E] [mailto:(b) (6)]  
**Sent:** Monday, July 08, 2019 5:56 PM  
**To:** Bezjian, Marisa (MDPR) <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Myers, Gwen (MDPR) <(b) (6)> Scott, Dana (NIH/NIAID) [E] <(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E] <(b) (6)> Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)> Cisar, Alphonse (NIH/OD/ORS) [E] <(b) (6)> LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Schountz, Tony <(b) (6)>  
**Subject:** Re: Bats at zoo miami

EMAIL RECEIVED FROM EXTERNAL SOURCE.



Yes, we are still very interested. We think that we can take ~300 – 400 of the Artibeus. I'm currently in the process of trying to arrange the details for the shipping.

Do you have a time-frame when we need to have this in place?

Regards,

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Bezjian, Marisa (MDPR)" <(b) (6)>  
**Date:** Monday, July 8, 2019 at 1:12 PM  
**To:** '(b) (6)' <(b) (6)>  
**Cc:** "Traverse, James (MDPR)" <(b) (6)> "Myers, Gwen (MDPR)" <(b) (6)> Dana Scott <(b) (6)> Heinrich Feldmann <(b) (6)> Joe Blaney <(b) (6)> Trenton Bushmaker <(b) (6)> "Towner, Jonathan (Jon) (CDC/DDID/NCEZID/DHCPP)" <(b) (6)>  
**Subject:** Re: Bats at zoo miami

Hello Vincent,

I was wondering if you have anyone interested in our bats. If not, we can start looking into other options. Please let me know if you have any questions.

Thank you,

-Marisa

Sent from my iPhone

On Jul 2, 2019, at 5:18 PM, Bezjian, Marisa (MDPR) <(b) (6)> wrote:

Hello Vincent,

Just wanted to check in with you to see if you had any other questions for us about the bat colony.

Thank you,

-Marisa

**Dr. Marisa Bezjian**, Associate Veterinarian  
Zoo Miami

12400 SW 152<sup>nd</sup> St.  
Miami, FL 33177  
**Phone:** (b) (6) ext. (b) (6)  
Miami-Dade County Parks, Recreation & Open Spaces  
[www.miamidade.gov/parks](http://www.miamidade.gov/parks)  
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*Please consider the environment before printing this email.*

---

**From:** Munster, Vincent (NIH/NIAID) [E] [mailto:(b) (6)]  
**Sent:** Thursday, June 20, 2019 3:52 PM  
**To:** Bezjian, Marisa (MDPR) <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Myers, Gwen (MDPR)  
<(b) (6)> Scott, Dana (NIH/NIAID) [E] <(b) (6)>  
Feldmann, Heinrich (NIH/NIAID) [E] <(b) (6)> Blaney, Joe (NIH/NIAID) [C]  
<(b) (6)> Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)>  
**Subject:** Re: Bats at zoo miami

EMAIL RECEIVED FROM EXTERNAL SOURCE.

We are still trying to decide how many animals we can house and how to arrange the transport. We are currently not looking at breeding, as we don't have the correct infrastructure yet. I hope to get back to you either tomorrow or at the beginning of next week. I hope this would still work.

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Bezjian, Marisa (MDPR)" <(b) (6)>  
**Date:** Tuesday, June 18, 2019 at 1:38 PM  
**To:** (b) (6) <(b) (6)>  
**Cc:** "Traverse, James (MDPR)" <(b) (6)> "Myers, Gwen (MDPR)"  
<(b) (6)> "Elkins, Randy (NIH/NIAID) [E]" <(b) (6)>  
Dana Scott <(b) (6)> Heinrich Feldmann <(b) (6)> "Holland,  
Steven (NIH/NIAID) [E]" <(b) (6)> "Towner, Jonathan (Jon)  
(CDC/DDID/NCEZID/DHCPP)" <(b) (6)> Joe Blaney <(b) (6)>  
**Subject:** RE: Bats at zoo miami

Hello Vincent,

I just wanted to follow up with you about our bat colony at Zoo Miami in the event you had any questions. We currently have a colony of female bats with about 570 bats, (450 Jamaican fruit bats [*Artibeus jamaicensis*] and 120 Seba's short tailed bats [*Carollia perspicillata*]). We are keeping the males in our collection and are interested in relocating the females. If you need males of these species to maintain the colony, please let us know.

We are happy to discuss this further.

Thank you,  
-Marisa

(b) (6) Zoo Miami veterinary hospital number  
(b) (6) cell

**Dr. Marisa Bezjian**, Associate Veterinarian  
**Zoo Miami**  
12400 SW 152<sup>nd</sup> St.  
Miami, FL 33177  
**Phone:** (b) (6) ext. (b) (6)  
Miami-Dade County Parks, Recreation & Open Spaces  
[www.miamidade.gov/parks](http://www.miamidade.gov/parks)  
Connect With Us on [Twitter](#) | [Facebook](#) | [Instagram](#)

*Please consider the environment before printing this email.*

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**From:** Munster, Vincent (NIH/NIAID) [E] [[\(b\) \(6\)](mailto:(b) (6))]  
**Sent:** Wednesday, June 12, 2019 4:36 PM  
**To:** Bezjian, Marisa (MDPR) <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Myers, Gwen (MDPR) <(b) (6)> Elkins, Randy (NIH/NIAID) [E] <(b) (6)> Scott, Dana (NIH/NIAID) [E] <(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E] <(b) (6)> Holland, Steven (NIH/NIAID) [E] <(b) (6)> Towner, Jonathan (Jon) (CDC/DDID/NCEZID/DHCPP) <(b) (6)> Blaney, Joe (NIH/NIAID) [C] <(b) (6)>  
**Subject:** Bats at zoo miami  
**Importance:** High

This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected emails. Please click here if this is a suspicious message [reportspam@miamidade.gov](mailto:reportspam@miamidade.gov) **Enterprise Security Office**

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We would be very interested in obtaining the bats (Jamaican fruit bats and Seba's short tailed bats). I think what we need to do from our end is to see whether we can put the husbandry

requirements in place and then discuss the timeline with you guys if we decide we'd like to move forward with this.

We have experience with husbandry and bat handling at NIH (Rousettus and Artibeus),

We can schedule a teleconference to see how to move this forward,

**I have copied the original email below to get the NIH people up to speed:**

*"I received your contact information from Dr. Darryl Heard from the University of Florida's College of Veterinary Medicine. At Zoo Miami, we have an overpopulation of Jamaican Fruit bats (Artibeus jamaicensis) and Seba's Short-tailed bats (Carollia perspicillata). We have recently separated the genders and now have a female population that we are trying to place. I think we are estimating 550 female bats that are looking for a good home (including research). I am trying to find options for this colony and was wondering if there may be an alternative placement for them. "*

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Wed, 7 Aug 2019 17:00:44 -0600  
**To:** Bushmaker, Trenton (NIH/NIAID) [E]; Fischer, Robert (NIH/NIAID) [F]; van Doremalen, Neeltje (NIH/NIAID) [E]; Letko, Michael (NIH/NIAID) [F]; Seifert, Stephanie (NIH/NIAID) [F]; Matson, Jeremiah (NIH/NIAID) [F]  
**Subject:** Re: Suite B again

I certainly hope that this is not one of us,

But if so, please change your behavior before OOC takes away your access

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Feldmann, Ricki (NIH/NIAID) [C]" <(b) (6)>  
**Date:** Wednesday, August 7, 2019 at 4:58 PM  
**To:** Trenton Bushmaker <(b) (6)> Robert Fischer <(b) (6)> Neeltje van Doremalen <(b) (6)> "Rosenke, Kyle (NIH/NIAID) [F]" <(b) (6)> "Haddock, Elaine (NIH/NIAID) [E]" <(b) (6)> Michael Letko <(b) (6)> "Hawman, David (NIH/NIAID) [F]" <(b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)> "Matson, Jeremiah (NIH/NIAID) [F]" <(b) (6)>  
**Cc:** Heinrich Feldmann <(b) (6)> "Shupert, W. Lesley (NIH/NIAID) [E]" <(b) (6)> Michael Jones <(b) (6)>  
**Subject:** Suite B again

Hello Again!

I'm a little tired to hear complaints.

**THE END OF DAY MEANS : YOUR END OF THE DAY! If you are the last one in the suite and there is waste Please autoclave!!**

I don't really want to bring this up with Heinz and have to find a more strict solution for the problem.

Thanks,

Ricki

---

**From:** Feldmann, Ricki (NIH/NIAID) [C]  
**Sent:** Monday, August 5, 2019 12:02 PM  
**To:** Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)> Fischer, Robert (NIH/NIAID) [F] <(b) (6)> van Doremalen, Neeltje (NIH/NIAID) [E] <(b) (6)>



Rosenke, Kyle (NIH/NIAID) [F] < (b) (6) Haddock, Elaine (NIH/NIAID) [E]  
< (b) (6) Letko, Michael (NIH/NIAID) [F] < (b) (6) Hawman, David  
(NIH/NIAID) [F] < (b) (6) Seifert, Stephanie (NIH/NIAID) [F]  
< (b) (6) Matson, Jeremiah (NIH/NIAID) [F] < (b) (6)  
**Cc:** Feldmann, Heinrich (NIH/NIAID) [E] < (b) (6) Munster, Vincent (NIH/NIAID) [E]  
< (b) (6) Shupert, W. Lesley (NIH/NIAID) [E] < (b) (6) Jones,  
Michael (NIH/NIAID) [E] < (b) (6)  
**Subject:** Suite B

Hello Team B,

It has been brought to my attention that Suite B has been quite messy in the last few weeks. As you all have learned during your training you are supposed to autoclave at the end of the day, or if you are the last one in the suite, the bags don't have to be completely full! I know it is a little painful right now because the autoclave is down, but it is not too much trouble to walk over to suite A. And of course you should have emptied the autoclave on your way in.

It is everybody's responsibility to keep the lab stocked, just grab something if your hands are empty!! And please clean up after yourself. I do realized that suite B is pretty full, if anybody wants to switch out please let me know. If everyone spends 5 minutes with every entry it should not be a problem to keep the suite clean.

And please remember everyone is busy, not just you.

Thank you for you cooperation,

Ricki

Friederike Feldmann  
Rocky Mountain Laboratory  
903 4<sup>th</sup> Street South  
Hamilton , MT 59840  
(b) (6)

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Wed, 7 Aug 2019 12:55:18 -0600  
**To:** Seifert, Stephanie (NIH/NIAID) [F]; Schountz, Tony  
**Cc:** Kwe Claude, Yinda (NIH/NIAID) [F]  
**Subject:** Re: Cool initiative for bat genomes

Yes, wouldn't change the current ASPs. Would still perform the analyses to see if we'll detect anything. You can probably still get away with analyses of the mock inoculated controls and see this more similar to NHP studies where you wouldn't include a matched control for each timepoint either. That said, we then would likely need to increase the control group numbers.

Lets wait and see what happens in the prelim study first, see what data we'd get and then design a bigger experiment focused at certain parts of the response.

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)>  
**Date:** Wednesday, August 7, 2019 at 12:40 PM  
**To:** '(b) (6) <(b) (6)> Tony Schountz  
<(b) (6)>  
**Cc:** "Kwe Claude, Yinda (NIH/NIAID) [F]" <(b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

We would need to redesign the experiments a bit I think, put in addendums for additional animals. We do not currently have naive controls for the early (relevant for expression analyses) time points. Would be easy for a reviewer to claim that isoflurane and the stress of daily handling/swabbing have an effect.

---

**From:** "Munster, Vincent (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Wednesday, August 7, 2019 at 12:24:32 PM  
**To:** "Schountz, Tony" <(b) (6)>  
**Cc:** "Kwe Claude, Yinda (NIH/NIAID) [F]" <(b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

Yeah, also trying to balance workload and downstream analyses.

We could probably decide during the experiments whether we want qRT-PCR profiling or NGS. As you said, with limited pathogenicity we'll not see much expression differences by NGs either

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Wednesday, August 7, 2019 at 8:50 AM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** "Kwe Claude, Yinda (NIH/NIAID) [F]" <[REDACTED] (b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <[REDACTED] (b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

Vinnie,

We have an annotated transcriptome data set. I can send them the data if they will find it useful. These are concanavalin A (T cell mitogen) and pokeweed mitogen (T and B cell mitogen) stimulate splenocytes.

We are also adopting this technology for assessing Aj antiviral responses, except we're just now developing the primer pairs that are suitable for SYBR Green:

<https://www.qiagen.com/us/products/discovery-and-translational-research/pcr-qpcr/qpcr-assays-and-instruments/mrna-incrna-qpcr-assays-panels/rt2-profiler-pcr-arrays/?catno=PAHS-122Z#orderinginformation>

The advantage of qPCR arrays over RNA seq is greater sensitivity. The disadvantage is that you can only detect what you look for. I think both complement one another.

T.

—

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

---

**From:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Tuesday, August 6, 2019 11:49 AM  
**To:** Schountz, Tony <(b) (6)>  
**Cc:** Kwe Claude, Yinda (NIH/NIAID) [F] <(b) (6)> Seifert, Stephanie (NIH/NIAID) [F]  
<(b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

Have you got a working draft for all the innate genes etc?

I think it would be cool to do some NSG work on the infected bats, but the bioinformatics people would need smtg to work with. I can start the conversation with our core facility

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <(b) (6)>  
**Date:** Tuesday, August 6, 2019 at 11:38 AM  
**To:** '(b) (6) <(b) (6)>  
**Cc:** Raina Plowright <(b) (6)> Alison Peel <(b) (6)> Aga Apple  
<(b) (6) "Kwe Claude, Yinda (NIH/NIAID) [F]"  
<(b) (6) "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)  
Sarah Olson <(b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

Not annotated but it is blastable for contigs.

[https://blast.ncbi.nlm.nih.gov/Blast.cgi?PAGE\\_TYPE=BlastSearch&PROG\\_DEF=blastn&BLAST\\_SPEC=Assembly&ASSEMBLY\\_NAME=GCA\\_004027435.1](https://blast.ncbi.nlm.nih.gov/Blast.cgi?PAGE_TYPE=BlastSearch&PROG_DEF=blastn&BLAST_SPEC=Assembly&ASSEMBLY_NAME=GCA_004027435.1)

Sent from my iPhone



On Aug 6, 2019, at 8:24 AM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:

So there is a fully annotated Artibeus genome now?

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED]> (b) (6)  
**Date:** Tuesday, August 6, 2019 at 9:16 AM  
**To:** '[REDACTED]' <[REDACTED]> (b) (6) <[REDACTED]> (b) (6)  
**Cc:** Raina Plowright <[REDACTED]> (b) (6) Alison Peel <[REDACTED]> (b) (6) Aga Apple <[REDACTED]> (b) (6) "Kwe Claude, Yinda (NIH/NIAID) [F]" <[REDACTED]> (b) (6) "Seifert, Stephanie (NIH/NIAID) [F]" <[REDACTED]> (b) (6) Sarah Olson <[REDACTED]> (b) (6)  
**Subject:** Re: Cool initiative for bat genomes

I submitted artibeus to them more than a year ago but heard nothing back. They've since done it's genome.

Sent from my iPhone

On Aug 6, 2019, at 9:11 AM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:

<https://bat1k.ucd.ie/sign-up/>

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 6 Aug 2019 12:23:16 -0600  
**To:** Schountz, Tony  
**Cc:** Kwe Claude, Yinda (NIH/NIAID) [F]; Seifert, Stephanie (NIH/NIAID) [F]  
**Subject:** Re: Cool initiative for bat genomes

Yeah, makes sense. We'll start talking with genomics to see what they would like. I'm wondering whether people still use custom arrays

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <(b) (6)>  
**Date:** Tuesday, August 6, 2019 at 12:11 PM  
**To:** '(b) (6) <(b) (6)>  
**Cc:** "Kwe Claude, Yinda (NIH/NIAID) [F]" <(b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <(b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

We're testing a few dozen primer pairs for SYBR green qPCR for antiviral genes. We've published a couple of transcriptome papers including with Tacaribe virus. Disease gets much better results with transcriptome profiling than does apathogenic reservoir host infections.

On a train and getting ready to leave so won't be able to respond for a while.

Sent from my iPhone

On Aug 6, 2019, at 10:49 AM, Munster, Vincent (NIH/NIAID) [E] <(b) (6)> wrote:

Have you got a working draft for all the innate genes etc?

I think it would be cool to do some NSG work on the infected bats, but the bioinformatics people would need smtg to work with. I can start the conversation with our core facility

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Tuesday, August 6, 2019 at 11:38 AM  
**To:** "[REDACTED] (b) (6) <[REDACTED] (b) (6)>  
**Cc:** Raina Plowright <[REDACTED] (b) (6)> Alison Peel <[REDACTED] (b) (6)> Aga Apple <[REDACTED] (b) (6)> "Kwe Claude, Yinda (NIH/NIAID) [F]" <[REDACTED] (b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <[REDACTED] (b) (6)> Sarah Olson <[REDACTED] (b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

Not annotated but it is blastable for contigs.

[https://blast.ncbi.nlm.nih.gov/Blast.cgi?PAGE\\_TYPE=BlastSearch&PROG\\_DEF=blastn&BLAST\\_SP\\_EC=Assembly&ASSEMBLY\\_NAME=GCA\\_004027435.1](https://blast.ncbi.nlm.nih.gov/Blast.cgi?PAGE_TYPE=BlastSearch&PROG_DEF=blastn&BLAST_SP_EC=Assembly&ASSEMBLY_NAME=GCA_004027435.1)

Sent from my iPhone

On Aug 6, 2019, at 8:24 AM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

So there is a fully annotated Artibeus genome now?

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Tony Schountz <[REDACTED] (b) (6)>  
**Date:** Tuesday, August 6, 2019 at 9:16 AM  
**To:** "[REDACTED] (b) (6) <[REDACTED] (b) (6)>  
**Cc:** Raina Plowright <[REDACTED] (b) (6)> Alison Peel <[REDACTED] (b) (6)> Aga Apple <[REDACTED] (b) (6)> "Kwe Claude, Yinda (NIH/NIAID) [F]" <[REDACTED] (b) (6)> "Seifert, Stephanie (NIH/NIAID) [F]" <[REDACTED] (b) (6)> Sarah Olson <[REDACTED] (b) (6)>  
**Subject:** Re: Cool initiative for bat genomes

I submitted artibeus to them more than a year ago but heard nothing back. They've since done it's genome.

Sent from my iPhone

On Aug 6, 2019, at 9:11 AM, Munster, Vincent (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

<https://bat1k.ucd.ie/sign-up/>

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 6 Aug 2019 08:56:46 -0600  
**To:** Seifert, Stephanie (NIH/NIAID) [F]; Letko, Michael (NIH/NIAID) [F]  
**Subject:** And associated paper

<https://www.annualreviews.org/doi/full/10.1146/annurev-animal-022516-022811>

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 6 Aug 2019 08:55:29 -0600  
**To:** Seifert, Stephanie (NIH/NIAID) [F]; Letko, Michael (NIH/NIAID) [F]  
**Subject:** Of inters test for review and science

<https://bat1k.ucd.ie/progress/>

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Tue, 6 Aug 2019 08:39:46 -0600  
**To:** van Doremalen, Neeltje (NIH/NIAID) [E]; Matson, Jeremiah (NIH/NIAID) [F]; Kwe Claude, Yinda (NIH/NIAID) [F]; Fischer, Robert (NIH/NIAID) [F]; Bushmaker, Trenton (NIH/NIAID) [E]; Letko, Michael (NIH/NIAID) [F]; Avanzato, Victoria (NIH/NIAID) [F]; Seifert, Stephanie (NIH/NIAID) [F]; Schulz, Jonathan (NIH/NIAID) [F]; Holbrook, Myndi (NIH/NIAID) [F]; Saturday, Kristen (NIH/NIAID) [F]; Offei Owusu, Irene (NIH/NIAID) [F]  
**Subject:** Reminder SIP student talk today

As a reminder, instead of the lab meeting we'll attend the summer student symposium at 3

Cheers,

Vincent

**From:** Munster, Vincent (NIH/NIAID) [E]  
**Sent:** Thu, 1 Aug 2019 11:45:48 -0600  
**To:** LaCasse, Rachel (NIH/NIAID) [E]; Watkins Rogers, Rachel (MDPR); Kendall, Lon; Schountz, Tony; Adams, Michelle; Cisar, Alpie (NIH/OD/ORS) [E]; Keenan, Heather (MDPR); Svoke, Joseph (MDPR); Traverse, James (MDPR); Bezjian, Marisa (MDPR); Myers, Gwen (MDPR); Clifton, Dawn (NIH/NIAID) [E]; Feldmann, Heinrich (NIH/NIAID) [E]; Fischer, Robert (NIH/NIAID) [F]  
**Cc:** Scott, Dana (NIH/NIAID) [E]  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Just to clarify:

There will be two shipments:

**1** to Dr. Kendall in Colorado, close to 300 - 400 bats

**2** directly to RML in Montana (small amount, ~ 60 bats)

Kind regards,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "LaCasse, Rachel (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Thursday, August 1, 2019 at 11:39 AM  
**To:** "Watkins Rogers, Rachel (MDPR)" <(b) (6)>  
<(b) (6)> <(b) (6)> Lon Kendall  
<(b) (6)> Tony Schountz <(b) (6)>  
"Adams, Michelle" <(b) (6)> "Cisar, Alpie (NIH/OD/ORS) [E]"  
<(b) (6)> "Keenan, Heather (MDPR)" <(b) (6)>  
"Svoke, Joseph (MDPR)" <(b) (6)> "Traverse, James (MDPR)"  
<(b) (6)> "Bezjian, Marisa (MDPR)"  
<(b) (6)> "Myers, Gwen (MDPR)" <(b) (6)>  
"Clifton, Dawn (NIH/NIAID) [E]" <(b) (6)> Heinrich Feldmann  
<(b) (6)> Robert Fischer <(b) (6)>  
**Cc:** Dana Scott <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Hello All,

I think there might be a misunderstanding, as RML only has holding room for approximately 60 female bats, so unfortunately we would not be able to house the bats that are slated to go to CO. Please feel free to contact me at any time if there are any questions/concerns.

Thanks so much for all of your help,  
Rachel

Rachel A. LaCasse, Ph.D., CMAR, RLATG  
Animal Program Administrator  
Rocky Mountain Veterinary Branch  
Rocky Mountain Laboratories, NIAID, NIH  
903 South 4<sup>th</sup> St.  
Hamilton, MT 59840  
Phone: (b) (6)  
Cell: (b) (6)  
Email: (b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) <(b) (6)>  
**Sent:** Wednesday, July 31, 2019 3:20 PM  
**To:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Kendall, Lon  
<(b) (6)> Schountz, Tony <(b) (6)> Adams, Michelle  
<(b) (6)> LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Cisar,  
Alphie (NIH/OD/ORS) [E] <(b) (6)> Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,  
James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)> Clifton,  
Dawn (NIH/NIAID) [E] <(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E]  
<(b) (6)> Fischer, Robert (NIH/NIAID) [F] <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Thank you!

Please consult with Alphie, so we can coordinate this information. I understand there is a delay in CO due to construction needs and Alphie indicated we could send them all to MT and that CO could p/u from MT. We still need #s of how many bats. Please add the missing information to the attached application and return it to me for follow-up.

Thank you for your help, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Munster, Vincent (NIH/NIAID) [E] [\(mailto:\(b\) \(6\)\)](mailto:(b) (6))  
**Sent:** Wednesday, July 31, 2019 4:58 PM  
**To:** Watkins Rogers, Rachel (MDPR) <(b) (6)> Kendall, Lon  
<(b) (6)> Schountz, Tony <(b) (6)> Adams, Michelle  
<(b) (6)> LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Cisar,  
Alphie (NIH/OD/ORS) [E] <(b) (6)> Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,  
James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)> Clifton,

Dawn (NIH/NIAID) [E] <[REDACTED] (b) (6) Feldmann, Heinrich (NIH/NIAID) [E]  
<[REDACTED] (b) (6) Fischer, Robert (NIH/NIAID) [F] <[REDACTED] (b) (6)

**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

**Importance:** High

EMAIL RECEIVED FROM EXTERNAL SOURCE.

Hi Rachel,

I have added Dr. bob Fischer to the conversation who is the permit specialist from our end and would be able to help us further asap,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Watkins Rogers, Rachel (MDPR)" <[REDACTED] (b) (6)

**Date:** Wednesday, July 31, 2019 at 2:49 PM

**To:** "[REDACTED] (b) (6) <[REDACTED] (b) (6) Lon Kendall  
<[REDACTED] (b) (6) Tony Schountz <[REDACTED] (b) (6)

"Adams,Michelle" <[REDACTED] (b) (6) "LaCasse, Rachel (NIH/NIAID) [E]"  
<[REDACTED] (b) (6) "Cisar, Alphie (NIH/OD/ORS) [E]" [REDACTED] (b) (6), "Keenan,  
Heather (MDPR)" <[REDACTED] (b) (6) "Svoke, Joseph (MDPR)"  
<[REDACTED] (b) (6) "Traverse, James (MDPR)"  
<[REDACTED] (b) (6) "Bezjian, Marisa (MDPR)"  
<[REDACTED] (b) (6) "Myers, Gwen (MDPR)" <[REDACTED] (b) (6)  
"Clifton, Dawn (NIH/NIAID) [E]" <[REDACTED] (b) (6) Heinrich Feldmann  
<[REDACTED] (b) (6)

**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good afternoon Lon and Vincent,

I am currently working with Alphie on the shipping containers, CDC permit application, and numbers of bats which we currently do not have yet.

- I cannot complete the CDC permit until I have the count of bats.
- I will be off Thursday and Friday this week, returning on Saturday.
- This is the application with the rest of the needed information if you wish to provide it to me ([https://www.cdc.gov/cpr/ipp/forms/permit\\_to\\_import\\_or\\_transport\\_live\\_bats.pdf](https://www.cdc.gov/cpr/ipp/forms/permit_to_import_or_transport_live_bats.pdf)).

I appreciate your help!



Thank you, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Munster, Vincent (NIH/NIAID) [E] [\[mailto: \(b\) \(6\)\]](mailto:)  
**Sent:** Wednesday, July 31, 2019 4:09 PM  
**To:** Kendall, Lon < (b) (6) > Watkins Rogers, Rachel (MDPR)  
< (b) (6) > Schountz, Tony < (b) (6) > Adams, Michelle  
< (b) (6) > LaCasse, Rachel (NIH/NIAID) [E] < (b) (6) > Cisar,  
Alphie (NIH/OD/ORS) [E] < (b) (6) > Keenan, Heather (MDPR)  
< (b) (6) > Svoke, Joseph (MDPR) < (b) (6) > Traverse,  
James (MDPR) < (b) (6) > Bezjian, Marisa (MDPR)  
< (b) (6) > Myers, Gwen (MDPR) < (b) (6) > Clifton,  
Dawn (NIH/NIAID) [E] < (b) (6) > Feldmann, Heinrich (NIH/NIAID) [E]  
< (b) (6) >  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.

Sounds good,

Fingers crossed the permits will be issued asap,

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Section  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** Lon Kendall < (b) (6) >  
**Date:** Wednesday, July 31, 2019 at 1:30 PM  
**To:** "Watkins Rogers, Rachel (MDPR)" < (b) (6) > Tony Schountz  
< (b) (6) > "Adams,Michelle" < (b) (6) >  
"LaCasse, Rachel (NIH/NIAID) [E]" < (b) (6) > "Cisar, Alphie (NIH/OD/ORS) [E]"  
< (b) (6) > " (b) (6) < (b) (6) > "Keenan,  
Heather (MDPR)" < (b) (6) > "Svoke, Joseph (MDPR)"  
< (b) (6) > "Traverse, James (MDPR)"  
< (b) (6) > "Bezjian, Marisa (MDPR)"  
< (b) (6) > "Myers, Gwen (MDPR)" < (b) (6) >  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

I'm just awaiting a permit from Colorado Parks and Wildlife. Once I get that we can discuss shipping. They said it would take 3-4 weeks.

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496

(b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) <(b) (6)>  
**Sent:** Monday, July 22, 2019 1:40 PM  
**To:** Kendall, Lon <(b) (6)> Schountz, Tony <(b) (6)>  
Adams, Michelle <(b) (6)> LaCasse, Rachel (NIH/NIAID) [E]  
<(b) (6)> Cisar, Alphonse (NIH/OD/ORS) [E] <(b) (6)> Munster, Vincent  
(NIH/NIAID) [E] <(b) (6)> Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,  
James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Thank you Lon,

I will wait to hear from you and can start this ePermit tomorrow or Friday.

Thank you, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Kendall, Lon [mailto:(b) (6)]  
**Sent:** Monday, July 22, 2019 3:38 PM  
**To:** Watkins Rogers, Rachel (MDPR) <(b) (6)> Schountz, Tony  
<(b) (6)> Adams, Michelle <(b) (6)> LaCasse, Rachel  
(NIH/NIAID) [E] <(b) (6)>; Cisar, Alphonse (NIH/OD/ORS) [E] <(b) (6)>  
Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,  
James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.



It would be mixed. I'd need to get with Tony and Vincent to see what ratio they would like. My guess is more females than males. 4-5:1.

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496  
(b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) <(b) (6)>  
**Sent:** Monday, July 22, 2019 1:36 PM  
**To:** Kendall, Lon <(b) (6)> Schountz, Tony <(b) (6)>  
Adams, Michelle <(b) (6)> LaCasse, Rachel (NIH/NIAID) [E]  
<(b) (6)> Cisar, Alphonse (NIH/OD/ORS) [E] <(b) (6)> Munster, Vincent  
(NIH/NIAID) [E] <(b) (6)> Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,  
James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Excellent Lon,

I will start the ePermit on the USDA website. Is that 300 males, females, or a mix of genders?

Thank you, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Kendall, Lon [mailto:(b) (6)]  
**Sent:** Monday, July 22, 2019 3:33 PM  
**To:** Watkins Rogers, Rachel (MDPR) <(b) (6)> Schountz, Tony  
<(b) (6)> Adams, Michelle <(b) (6)> LaCasse, Rachel  
(NIH/NIAID) [E] <(b) (6)>; Cisar, Alphonse (NIH/OD/ORS) [E] <(b) (6)>  
Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,  
James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.

We decided I'd sign the documents.

I'm trying to confirm some room information to see how many we can take. It will be close to 300.

Lon

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: (b) (6)  
Cell: (b) (6)  
Fax: 970-491-2496  
(b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) <(b) (6)>  
**Sent:** Monday, July 22, 2019 1:14 PM  
**To:** Kendall, Lon <(b) (6)> Schountz, Tony <(b) (6)>  
Adams, Michelle <(b) (6)> LaCasse, Rachel (NIH/NIAID) [E]  
<(b) (6)> Cisar, Alpie (NIH/OD/ORS) [E] <(b) (6)> Munster, Vincent  
(NIH/NIAID) [E] <(b) (6)>; Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)> Traverse,  
James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good afternoon Lon,

I very much appreciate your help. I have attached a copy of our last bat permit and will begin the process once I get a few details.

Questions: Do I use your name to sign the donation or Dr. Schountz? Do you know a count of bats yet for your group transfer to CO?

Thank you for your help, Rachél

**New** Days off: Wednesday/Thursday

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**From:** Kendall, Lon [mailto:(b) (6)]  
**Sent:** Monday, July 22, 2019 2:25 PM  
**To:** Schountz, Tony <(b) (6)> Adams, Michelle  
<(b) (6)> Watkins Rogers, Rachel (MDPR) <(b) (6)>  
LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Cisar, Alpie (NIH/OD/ORS) [E]  
<(b) (6)> Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Keenan, Heather  
(MDPR) <(b) (6)> Svoke, Joseph (MDPR) <(b) (6)>

Traverse, James (MDPR) <[REDACTED] (b) (6) Bezjian, Marisa (MDPR)  
<[REDACTED] (b) (6) Myers, Gwen (MDPR) <[REDACTED] (b) (6)  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

EMAIL RECEIVED FROM EXTERNAL SOURCE.

All,

The physical address for shipment is:  
3185 RAMPART RD.  
FORT COLLINS, CO 80521

Mailing address is  
2007 Campus Delivery  
Fort Collins, CO 80523-2007

Lon

Lon V. Kendall, DVM, PhD, DACLAM  
Director, Laboratory Animal Resources and  
Attending Veterinarian, Colorado State University  
2007 Painter Center  
Colorado State University  
Fort Collins, CO 80523  
Voice: [REDACTED] (b) (6)  
Cell: [REDACTED] (b) (6)  
Fax: 970-491-2496  
[REDACTED] (b) (6)

---

**From:** Schountz,Tony  
**Sent:** Sunday, July 21, 2019 6:45 AM  
**To:** Kendall,Lon <[REDACTED] (b) (6) Adams,Michelle [REDACTED] (b) (6)  
**Subject:** Fw: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Hi Lon and Michelle,

Can you tell us our shipping address for receiving live animals?

Lon, as a reminder, Vincent and I would like to get some of the Carolia bats, too, for a one-time challenge experiment with influenza. I will get on the protocol when I return from ASV this week.

Thanks,

Tony

---

Tony Schountz, PhD  
Associate Professor  
Arthropod-borne and Infectious Disease Laboratory  
Department of Microbiology, Immunology and Pathology  
College of Veterinary Medicine  
Colorado State University  
3185 Rampart Road  
Fort Collins, CO 80523-1692

(b) (6)

(b) (6)

---

**From:** Watkins Rogers, Rachel (MDPR) <(b) (6)>  
**Sent:** Saturday, July 20, 2019 3:10 PM  
**To:** LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Cisar, Alpie (NIH/OD/ORS) [E]  
<(b) (6)> Schountz, Tony <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Bezjian, Marisa (MDPR)  
<(b) (6)> Myers, Gwen (MDPR) <(b) (6)> Munster,  
Vincent (NIH/NIAID) [E] <(b) (6)> Keenan, Heather (MDPR)  
<(b) (6)> Svoke, Joseph (MDPR) <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good evening Rachel, Alpie, and Dr. Schountz,

We are continuing to work on our 'internal' approval of this transfer and I am working on the donation documents. I have some questions that I could use feedback for to be able to prepare the donations.

- Please provide the 'physical' address the bats will be shipped to and if you also have a mailing address that differs please provide both.
- We assume you wish to be invoiced for the shipment or do you have an account we should use?



- Please provide the name, address, phone, email, fax, and name to be used for the signatory of each (or both) labs.
- Please provide the count or gender ratio of bats you wish to receive. Current inventory of Artibeus jamaicensis / Jamaican fruit bat is 432.487.0 (919 bats)

We are very appreciative of your willingness to accept these bats.

Respectfully, Rachél

**Rachél Watkins Rogers**, Zoo Registrar and Records Coordinator

**New Days off: Wednesday/Thursday**

**Zoo Miami** 12400 SW 152 Street, Miami, FL 33177-1499

P: (b) (6); F: [305.378.6381](tel:305.378.6381) / **new** E: (b) (6)

Parks, Recreation and Open Spaces ([miamidade.gov](http://miamidade.gov))

**"Delivering Excellence Every Day"**

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**From:** Munster, Vincent (NIH/NIAID) [E] [\(b\) \(6\)](mailto:(b) (6))  
**Sent:** Tuesday, July 09, 2019 11:51 AM  
**To:** Watkins Rogers, Rachel (MDPR) <(b) (6)> Myers, Gwen (MDPR) <(b) (6)> Scott, Dana (NIH/NIAID) [E] <(b) (6)> LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Schountz, Tony <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E] <(b) (6)> Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)> Cisar, Alphie (NIH/OD/ORS) [E] <(b) (6)> Schountz, Tony <(b) (6)> Bezjian, Marisa (MDPR) <(b) (6)> Clifton, Dawn (NIH/NIAID) [E] <(b) (6)>  
**Subject:** Re: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )  
**Importance:** High

EMAIL RECEIVED FROM EXTERNAL SOURCE.

Hi Rachel,

From our end Rachel LaCassa and Alphonse Cisar will coordinate the shipment and provide you with the necessary information in terms of location and the coordination of the shipment.

We will be using two different locations, one in Hamilton Montana of the NIH and one at Colorado State University. Dr. Tony Schountz will provide you with the necessary information on the housing at Colorado State University,

Kind regards,

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Watkins Rogers, Rachel (MDPR)" <(b) (6)>  
**Date:** Tuesday, July 9, 2019 at 7:12 AM  
**To:** "Myers, Gwen (MDPR)" <(b) (6)> "(b) (6)" <(b) (6)>  
<(b) (6)>  
**Cc:** "Traverse, James (MDPR)" <(b) (6)> Dana Scott <(b) (6)> Heinrich Feldmann <(b) (6)> Trenton Bushmaker <(b) (6)> "Cisar, Alphonse (NIH/OD/ORS) [E]" <(b) (6)> "LaCassa, Rachel (NIH/NIAID) [E]" <(b) (6)> Tony Schountz <(b) (6)> "(b) (6)" <(b) (6)> "Bezjian, Marisa (MDPR)" <(b) (6)>  
**Subject:** RE: Bats at zoo miami (Artibeus jamaicensis / Jamaican fruit bat )

Good morning Gwen and Dr. Munster,

I would love to help expedite the processes, but I need some information. We must follow some guidelines for me to prepare the donation form since this is a transaction involving 'live' collection animals.

1. *Artibeus jamaicensis* / Jamaican fruit bat (**Currently: 433.487.0 = 920 bats**): "~300 – 400 of the *Artibeus*". **Action item:** Please provide the gender ratio (males : females) for deaccessioning purposes of our inventory.
2. Physical address for shipment. **Action item:** Please provide the physical and mailing address.
3. Contact name and signatory name. **Action item:** Please provide the person's name that is coordinating the shipment to NIH and the person authorizing the acquisition of the bats.
4. Contact and signatory address & contact info. **Action item:** Please provide the phone, fax, email, physical, mailing address of the signatory and coordinator for the purposes of completing this donation.
5. **IMPORTANT:** Do you need any of our permits besides our USDA license and Florida Fish and Wildlife exemption for a Class III permit for these bats?

I appreciate your quick turnaround on getting the needed on the action items above!

Respectfully, Rachél

Rachél Watkins Rogers, Zoo Registrar and Records Coordinator

**New Days off: Wednesday/Thursday**

Zoo Miami 12400 SW 152 Street, Miami, FL 33177-1499

P: (b) (6); F: [305.378.6381](tel:305.378.6381) / new E: (b) (6)

Parks, Recreation and Open Spaces ([miamidade.gov](http://miamidade.gov))

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*Miami-Dade County is a public entity subject to Chapter 119 of the Florida Statutes concerning public records. E-mail messages are covered under such laws and thus subject to disclosure.*



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**From:** Myers, Gwen (MDPR)

**Sent:** Tuesday, July 09, 2019 8:28 AM

**To:** Munster, Vincent (NIH/NIAID) [E] <(b) (6)> Bezjian, Marisa (MDPR)

<(b) (6)> Watkins Rogers, Rachel (MDPR)

<(b) (6)>

**Cc:** Traverse, James (MDPR) <(b) (6)> Scott, Dana (NIH/NIAID) [E]

<(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E] <(b) (6)>

Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)> Cisar, Alphie

(NIH/OD/ORS) [E] <(b) (6)> LaCasse, Rachel (NIH/NIAID) [E]

<(b) (6)> Schountz, Tony <(b) (6)>

**Subject:** RE: Bats at zoo miami

Hi Vincent,



Thank you for getting back to us. We are motivated to move them as soon as possible, but would love to have them shipped out by August 1<sup>st</sup>. If that timeline is going to be difficult, please let us know. The pressure we are feeling to move them is due to the hurricane season – the bat cage they are in would likely not contain them if a hurricane damaged it, and we do not want to be adding more invasives to the South Florida wildlife! Let us know if there is anything we can do to help.

Thanks,  
Gwen

**Gwen E. Myers, DVM**  
Chief, Animal Health  
Zoo Miami  
12400 SW 152nd St. Miami, FL 33177  
Phone: 3 (b) (6) ext. (b) (6)  
Miami-Dade Co. Parks, Recreation & Open Spaces Dept.  
miamidade.gov

---

**From:** Munster, Vincent (NIH/NIAID) [E] [mailto:(b) (6)]  
**Sent:** Monday, July 08, 2019 5:56 PM  
**To:** Bezjian, Marisa (MDPR) <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Myers, Gwen (MDPR) <(b) (6)>  
<(b) (6)> Scott, Dana (NIH/NIAID) [E] <(b) (6)>  
Feldmann, Heinrich (NIH/NIAID) [E] <(b) (6)> Bushmaker, Trenton (NIH/NIAID) [E] <(b) (6)>  
<(b) (6)> Cisar, Alphonse (NIH/OD/ORS) [E] <(b) (6)>  
<(b) (6)> LaCasse, Rachel (NIH/NIAID) [E] <(b) (6)> Schountz, Tony <(b) (6)>  
**Subject:** Re: Bats at zoo miami

EMAIL RECEIVED FROM EXTERNAL SOURCE.

Yes, we are still very interested. We think that we can take ~300 – 400 of the Artibeus. I'm currently in the process of trying to arrange the details for the shipping.

Do you have a time-frame when we need to have this in place?

Regards,

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Bezjian, Marisa (MDPR)" <(b) (6)>  
**Date:** Monday, July 8, 2019 at 1:12 PM



**To:** (b) (6) <(b) (6)>  
**Cc:** "Traverse, James (MDPR)" <(b) (6)> "Myers, Gwen (MDPR)" <(b) (6)>  
<(b) (6) Dana Scott <(b) (6) Heinrich Feldmann <(b) (6)>  
<(b) (6) Joe Blaney <(b) (6) Trenton Bushmaker <(b) (6)>  
<(b) (6) "Towner, Jonathan (Jon) (CDC/DDID/NCEZID/DHCPP)" <(b) (6)>  
<(b) (6)>

**Subject:** Re: Bats at zoo miami

Hello Vincent,

I was wondering if you have anyone interested in our bats. If not, we can start looking into other options. Please let me know if you have any questions.

Thank you,

-Marisa

Sent from my iPhone

On Jul 2, 2019, at 5:18 PM, Bezjian, Marisa (MDPR) <(b) (6)> wrote:

Hello Vincent,

Just wanted to check in with you to see if you had any other questions for us about the bat colony.

Thank you,

-Marisa

**Dr. Marisa Bezjian**, Associate Veterinarian  
**Zoo Miami**  
12400 SW 152<sup>nd</sup> St.  
Miami, FL 33177  
**Phone:** (b) (6) ext. (b) (6)  
Miami-Dade County Parks, Recreation & Open Spaces  
[www.miamidade.gov/parks](http://www.miamidade.gov/parks)  
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---

**From:** Munster, Vincent (NIH/NIAID) [E] [\(b\) \(6\)](mailto:(b) (6))  
**Sent:** Thursday, June 20, 2019 3:52 PM  
**To:** Bezjian, Marisa (MDPR) <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Myers, Gwen (MDPR) <(b) (6)>  
<(b) (6) Scott, Dana (NIH/NIAID) [E] <(b) (6)>

Feldmann, Heinrich (NIH/NIAID) [E] <[REDACTED] (b) (6)> Blaney, Joe (NIH/NIAID) [C]  
<[REDACTED] (b) (6)> Bushmaker, Trenton (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Subject:** Re: Bats at zoo miami

EMAIL RECEIVED FROM EXTERNAL SOURCE.

We are still trying to decide how many animals we can house and how to arrange the transport. We are currently not looking at breeding, as we don't have the correct infrastructure yet. I hope to get back to you either tomorrow or at the beginning of next week. I hope this would still work.

Cheers,

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH

---

**From:** "Bezjian, Marisa (MDPR)" <[REDACTED] (b) (6)>  
**Date:** Tuesday, June 18, 2019 at 1:38 PM  
**To:** '[REDACTED] (b) (6)' <[REDACTED] (b) (6)>  
**Cc:** "Traverse, James (MDPR)" <[REDACTED] (b) (6)> "Myers, Gwen (MDPR)" <[REDACTED] (b) (6)> "Elkins, Randy (NIH/NIAID) [E]" <[REDACTED] (b) (6)> Dana Scott <[REDACTED] (b) (6)> Heinrich Feldmann <[REDACTED] (b) (6)> "Holland, Steven (NIH/NIAID) [E]" <[REDACTED] (b) (6)> "Towner, Jonathan (Jon) (CDC/DDID/NCEZID/DHCPP)" <[REDACTED] (b) (6)> Joe Blaney <[REDACTED] (b) (6)>  
**Subject:** RE: Bats at zoo miami

Hello Vincent,

I just wanted to follow up with you about our bat colony at Zoo Miami in the event you had any questions. We currently have a colony of female bats with about 570 bats, (450 Jamaican fruit bats [*Artibeus jamaicensis*] and 120 Seba's short tailed bats [*Carollia perspicillata*]). We are keeping the males in our collection and are interested in relocating the females. If you need males of these species to maintain the colony, please let us know.

We are happy to discuss this further.

Thank you,  
-Marisa

[REDACTED] (b) (6) Zoo Miami veterinary hospital number  
[REDACTED] (b) (6) cell

**Dr. Marisa Bezjian**, Associate Veterinarian  
Zoo Miami

12400 SW 152<sup>nd</sup> St.  
Miami, FL 33177  
**Phone:** (b) (6) ext. (b) (6)  
Miami-Dade County Parks, Recreation & Open Spaces  
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**From:** Munster, Vincent (NIH/NIAID) [E] [[\(b\) \(6\)](mailto:(b) (6))]  
**Sent:** Wednesday, June 12, 2019 4:36 PM  
**To:** Bezjian, Marisa (MDPR) <(b) (6)>  
**Cc:** Traverse, James (MDPR) <(b) (6)> Myers, Gwen (MDPR)  
<(b) (6)> Elkins, Randy (NIH/NIAID) [E] <(b) (6)> Scott,  
Dana (NIH/NIAID) [E] <(b) (6)> Feldmann, Heinrich (NIH/NIAID) [E]  
<(b) (6)> Holland, Steven (NIH/NIAID) [E] <(b) (6)>  
Towner, Jonathan (Jon) (CDC/DDID/NCEZID/DHCPP) <(b) (6)> Blaney, Joe  
(NIH/NIAID) [C] <(b) (6)>  
**Subject:** Bats at zoo miami  
**Importance:** High

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We would be very interested in obtaining the bats (Jamaican fruit bats and Seba's short tailed bats). I think what we need to do from our end is to see whether we can put the husbandry requirements in place and then discuss the timeline with you guys if we decide we'd like to move forward with this.

We have experience with husbandry and bat handling at NIH (Rousettus and Artibeus),

We can schedule a teleconference to see how to move this forward.

**I have copied the original email below to get the NIH people up to speed:**

*"I received your contact information from Dr. Darryl Heard from the University of Florida's College of Veterinary Medicine. At Zoo Miami, we have an overpopulation of Jamaican Fruit bats (*Artibeus jamaicensis*) and Seba's Short-tailed bats (*Carollia perspicillata*). We have recently separated the genders and now have a female population that we are trying to place. I think we are estimating 550 female bats that are looking for a good home (including research). I am trying to find options for this colony and was wondering if there may be an alternative placement for them. "*

Vincent Munster, PhD  
Chief, Virus Ecology Unit  
Laboratory of Virology  
Rocky Mountain Laboratories  
NIAID/NIH



**From:** [Aleksei Chmura](#)  
**To:** [Lauer, Michael \(NIH/OD\) \[E\]](#)  
**Cc:** [Peter Daszak](#); [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Gratton, Shaun \(NIH/NIAID\) \[E\]](#); [Erbelding, Emily \(NIH/NIAID\) \[E\]](#); [Cassetti, Cristina \(NIH/NIAID\) \[E\]](#); [Linde, Emily \(NIH/NIAID\) \[E\]](#); [Amine Arustamyan](#); [Joe Riccardi](#)  
**Subject:** Re: Regarding 2R01AI110964  
**Date:** Friday, August 27, 2021 12:00:45 PM  
**Attachments:** [To EcoHealth 7 23 21 R01AI110964.pdf](#)  
[EHA response to NIH request for further documentation 8.27.21.pdf](#)  
[ATT00001.txt](#)

---

Dear Dr. Lauer,


Please find our response to your letter from 23 July 2021, attached.

Sincerely,

-Aleksei

Aleksei Chmura, PhD  
Chief of Staff &  
Authorized Organizational Representative


EcoHealth Alliance  
520 Eighth Avenue, Suite 1200  
New York, NY 10018, USA

 (b) (6) (direct)  
(mobile)  
Aleksei MacDurian (Skype)

[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Visit our blog: [www.ecohealthalliance.org/blog](http://www.ecohealthalliance.org/blog)

EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that promote conservation and prevent pandemics.

On Fri, Jul 23, 2021 at 5:27 PM Lauer, Michael (NIH/OD) [E] < (b) (6)> wrote:

Dear Dr. Chmura and Dr. Daszak

Please see attached.

Sincerely,

Michael S Lauer, MD



National Institutes of Health  
National Institute of Allergy  
and Infectious Diseases  
Bethesda, Maryland 20892

23 July 2021

Drs. Aleksei Chmura and Peter Daszak  
EcoHealth Alliance, Inc.  
460 W 34<sup>th</sup> St  
Suite 1701  
New York, NY 10001

Re: R01AI110964, U01AI151797, U01AI153420

Dear Drs. Chmura and Daszak:

Thank you for your correspondence of April 11, 2021 and April 23, 2021 regarding R01AI110964. We are in the process of conducting detailed analyses of your answers to our questions and well as of the documents you sent, and we have the following additional requests:

#### 1. Records

For us to continue our analyses, we will need to receive and review WIV's records validating expenditures specific to R01AI110964 as well as any and all monitoring, safety, and financial reports specific to R01AI110964 that WIV submitted to you. As a reminder, subawardees are required to have a financial management system that includes records that identify adequately the source and application of funds for federally-funded activities. These records must contain information pertaining to Federal awards, authorizations, obligations, unobligated balances, assets, expenditures, income and interest and be supported by source documentation. 45 C.F.R. §§ 75.101 and 75.302.

As a term and condition of award, NIH "must have the right of access to any documents, papers, or other records of the non-Federal entity which are pertinent to the Federal award, in order to make audits, examinations, excerpts, and transcripts" (45 C.F.R. 75.364). This right of access applies not only to awardee records, but also to subawardee records. Awardees indicate their acceptance of an NIH award and its associated terms and conditions as they draw down the NIH grant funds to support the scientific project (see NIHGPS [Section 5](#)).



We will also need to see subaward agreements, subawardee audit reports, subawardee safety monitoring documents, subawardee progress reports submitted to you, and subawardee financial and accounting records for two other NIH EcoHealth Alliance grants. Specifically, please send us all responsive documents for:

- U01AI151797 (Daszak): subawardees Chulalongkorn Hospital, Chulalongkorn University, Duke-National Singapore University, and University of North Carolina at Chapel Hill
- U01AI153420 (Epstein): subawardees International Center for Diarrhoeal Disease Research of Bangladesh, Institute of Epidemiology Disease Control and Research of Bangladesh.

We remind you that the Notice of Award for U01AI151797 already contains the following specific award conditions that must still be satisfied by 30 days from establishment.

Subaward Agreement Requirements: The ECOHEALTH ALLIANCE, INC. must provide NIAID with copies of all (existing and newly established) subaward agreements established under this award, including descriptions of the biosafety monitoring plans, within 30 days of establishment.

Federal Funding Accountability and Transparency Subaward Reporting System (FSRS) Requirements: This award is subject to the Transparency Act subaward reporting requirement of 2 CFR Part 170, which must be reported through the Federal Funding Accountability and Transparency Subaward Reporting System (FSRS). The ECOHEALTH ALLIANCE, INC. must provide NIAID with proof of documentation of timely entries of subaward information into the FSRS within 30 days of submitting to FSRS.

## 2. Reports

We are also writing to notify you that a review of our records for R01AI110964 indicates that EcoHealth Alliance, Inc. is out of compliance with requirements to submit the following reports that are outlined in the NIHGPS: the Federal Financial Report (FFR, see [8.4.1.2.3](#) Modified Financial Reporting Requirements) and the Interim Research Performance Progress Report (I-RPPR, see NIHGPS [8.4.1.4](#) Final Research Performance Progress Report).

R01AI110964 was issued under the Streamlined Noncompeting Award Process (SNAP). For awards under SNAP, an FFR must be submitted within 120 days after the end of the competitive segment and must report on the cumulative support awarded for the entire segment.

Additionally, NIH requires that organizations submit an Interim-RPPR while their Type 2 application is under consideration. In the event that the Type 2 is funded, NIH treats the Interim-RPPR as the annual performance report for the final year of the previous competitive segment.



The FFR and I-RPPR for R01AI110964 were due within 120 days after the end of the project period. In this case, the competitive segment ended on May 31, 2019, and reports were due September 30, 2019. To date, NIH has still not received these reports. Compliance with [Section 8, Administrative Requirements](#) within the NIH Grants Policy Statement (NIHGPS) is a standard term and condition of award that applies to all NIH recipients.

A recipient's failure to comply with the terms and conditions of award, may cause NIH to take one or more actions on the award, depending on the severity and duration of the non-compliance. Additionally, a history of non-compliance related to R01AI110964, including reporting non-compliance, may impact other projects where EcoHealth serves as the primary grant recipient. When a recipient has a history of failure to comply with the general or specific terms and conditions of a previous Federal award, NIH may impose specific award conditions on other awards of the recipient, including withholding authority to proceed to the next phase of a project until receipt of evidence of acceptable performance (see NIHGPS [Section 8.5](#), Remedies for Noncompliance or Enforcement Actions: Suspension, Termination, and Withholding of Support).

In closing, please be advised that EcoHealth Alliance, Inc. must satisfy the existing specific award condition for U01AI151797 by 30 days from establishment and must provide the remaining documents and reports requested herein for all three grants (R01AI110964, U01AI151797, U01AI153420) no later than August 27, 2021.

Please let me know if you have any questions concerning the information in this letter.

Sincerely,

Lauer, Michael (NIH/OD) [E] Digitally signed by Lauer,  
Michael (NIH/OD) [E]  
Date: 2021.07.23 17:24:01 -04'00'

Michael S Lauer, MD  
NIH Deputy Director for Extramural Research

(b) (6)

cc: Ms. Emily Linde  
Dr. Erik Stemmy





27 August 2021

Dr. Michael S. Lauer  
National Institutes of Health  
9000 Rockville Pike  
Bethesda, Maryland 20892

Dear Dr. Lauer,

In response to your requests for (1) records and (2) reports in your letter dated 23 July 2021, we provide the following responses and documentation. The requested files are too large to transmit via email, so they may be downloaded via the following Drop Box link. Let us know, if another method of file transfer would be preferred.

Drop Box Link:

(b) (6)

Responses:

### **1. Records**

#### **R01AI110964**

##### 01 WIV Documents.pdf

1. WIV Subaward Contracts & Invoices Y1-Y5
2. WIV Risk Assessment Matrixes 2016\*-2019
3. WIV FFATA Reports from 2015-2019
4. WIV Annual Reports 2014-2016
5. WIV DHHS PHS NIH OLAW Approvals for 2014-2019 and 2019-2024
6. WIV Subrecipient Monitoring 2016\*-2019

*\*EcoHealth Alliance began a formal Uniform Guidance subrecipient monitoring policy in 2016 as per OMB Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (2 CFR §200.331).*

##### 02 EHA FFRs from 2014-2019.pdf

#### **U01AI151797**

##### 01 Chulalongkorn Documents.pdf

1. Chulalongkorn Subaward Contract and Invoices
2. Chulalongkorn Subaward email and confirmation to NIAID

3. Chulalongkorn Risk Assessment Matrix
4. Chulalongkorn Audit
5. Chulalongkorn COI Policy
6. Chulalongkorn Subrecipient Monitoring

02 Duke-NUS Documents.pdf

1. Duke-NUS Subaward Contract\*
2. Duke-NUS Subaward email and confirmation to NIAID
3. Duke-NUS Risk Assessment Matrix
4. Duke-NUS Audit
5. Duke-NUS COI Policy

*\*Contract signed in Aug 2021, so Duke-NUS Subrecipient Monitoring form will be available early 2022*

03 UNC Documents.pdf

1. UNC Subaward Contract and Invoices
2. UNC Subaward email and confirmation to NIAID
3. UNC Risk Assessment Matrix
4. UNC Audit
5. UNC COI Policy
6. UNC Subrecipient Monitoring

04 FSRA-FFATA EID-SEARCH.pdf

In addition to the records listed above, we are fully in compliance with the award conditions for U01AI151797. Specifically, from the NoA language: (a) all subaward contract agreements including descriptions of biosafety monitoring plans and (b) proof of documentation of timely entries of subaward information into the FSRS reporting have been provided to our NIAID Program Officer and Grants Management Specialist within 30-days of establishment of the subaward contract or submitting subaward information to the FSRS, respectively. In the files above and following each Subaward Contract and Invoices, we have documentation of emails and responses of these reports and communications.

**U01AI153420**

01 icddr Documents.pdf

1. icddr,b Subaward Contract and Invoices
2. icddr,b Risk Assessment Matrix
3. icddr,b Audit
4. icddr,b COI Policy
5. icddr,b Subrecipient Monitoring

02 IEDCR Documents.pdf

1. IEDCR Subaward Contract and Invoices
2. IEDCR Risk Assessment Matrix
3. IEDCR Desk-Audit Questionnaire *\*in lieu of Audit document*
4. IEDCR COI Policy
5. IEDCR Subrecipient Monitoring

03 FSRS-FFATA Nipah Bangladesh.pdf

## 2. Reports

- a. The interim report (I-RPPR) for R01AI110964 has been submitted via the Interim-RPPR option in the eRA Commons system. Program Officer Erik Stemmy and Grants Management Specialist Shaun Gratton have been notified.
- b. Documentation of our submission of all quarterly FFR reports for years 1-6 (2014-2019) for R01AI110964 are included in the Drop Box link, above. Note that following the notice of award for 2R01AI110964 (24-July-19), its termination (27-Apr-20), subsequent of suspension (15-Jul-20), there was a change (01 Jan 21) to the process by which FFRs are required to be submitted such that the US DHHS Payment Management System (PMS) is now used instead of eRA Commons. The PMS does not recognize our previously-terminated, now-suspended grant number and we have requested that the PMS update their system to approve this grant number (update request number UPDA0229501). We have followed up as recently as this morning 8/27/21 (ticket number 264975). As soon as PMS updates their system, we will submit the report and notify our program officer and grants management specialist and send documentation.
- c. Reporting for U01AI151797, and U01AI153420 is up to date.

If any additional details or information are required, please let us know. We look forward to hearing from you.

Sincerely,

(b) (6)



Peter Daszak, PhD  
President, EcoHealth Alliance

(b) (6)



Aleksei Chmura, PhD  
Chief of Staff & AOR



Michael S Lauer, MD  
NIH Deputy Director for Extramural Research  
1 Center Drive, Building 1, Room 144  
Bethesda, MD 20892  
Phone: [REDACTED] (b) (6)  
Email: [REDACTED] (b) (6)

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**From:** [Aleksei Chmura](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Gratton, Shaun \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Peter Daszak](#); [Hongying Li](#)  
**Subject:** 5 R01 AI110964 (Interim Report)  
**Date:** Tuesday, August 3, 2021 1:42:44 PM  
**Attachments:** [5R01AI110964-05 Interim Report as submitted.pdf](#)

---

Dear Erik and Shaun,

We have submitted our interim report in the eRA commons system for our “Understanding the Risk of Bat Coronavirus Emergence” award (5 R01 AI110964-05).

Please let us know, if there is anything further required for this.

Many thanks,

-Aleksei

**Aleksei Chmura, PhD**  
*Chief of Staff &  
Authorized Organizational Representative*

EcoHealth Alliance  
520 Eighth Avenue, Suite 1200  
New York, NY 10018-4182

(b) (6) (office)  
(mobile)

[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

*EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation.*

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## A. COVER PAGE

<b>Project Title:</b> Understanding the Risk of Bat Coronavirus Emergence	
<b>Grant Number:</b> 5R01AI110964-05	<b>Project/Grant Period:</b> 06/01/2014 - 05/31/2019
<b>Reporting Period:</b> 06/01/2018 - 05/31/2019	<b>Requested Budget Period:</b> 06/01/2018 - 05/31/2019
<b>Report Term Frequency:</b> Annual	<b>Date Submitted:</b> 08/03/2021
<b>Program Director/Principal Investigator Information:</b> PETER DASZAK , PHD BS  <b>Phone Number:</b> 212 380 4460 <b>Email:</b> (b) (6)	<b>Recipient Organization:</b> ECOHEALTH ALLIANCE, INC. ECOHEALTH ALLIANCE, INC. 520 EIGHTH AVENUE NEW YORK, NY 100181620  <b>DUNS:</b> 077090066 <b>EIN:</b> 1311726494A1  <b>RECIPIENT ID:</b>
<b>Change of Contact PD/PI:</b> NA	
<b>Administrative Official:</b> ALEKSEI CHMURA 460 W 34th St., 17th Floor New York, NY 10001  <b>Phone number:</b> (b) (6) <b>Email:</b> (b) (6)	<b>Signing Official:</b> ALEKSEI CHMURA 460 W 34th St., 17th Floor New York, NY 10001  <b>Phone number:</b> (b) (6) <b>Email:</b> (b) (6)
<b>Human Subjects:</b> Yes <b>HS Exempt:</b> NA <b>Exemption Number:</b> <b>Phase III Clinical Trial:</b> NA	<b>Vertebrate Animals:</b> NA
<b>hESC:</b> No	<b>Inventions/Patents:</b> No

## B. ACCOMPLISHMENTS

### B.1 WHAT ARE THE MAJOR GOALS OF THE PROJECT?

Zoonotic coronaviruses are a significant threat to global health, as demonstrated with the emergence of severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002, and the recent emergence Middle East Respiratory Syndrome (MERS-CoV). The wildlife reservoirs of SARS-CoV were identified by our group as bat species, and since then hundreds of novel bat-CoVs have been discovered (including >260 by our group). These, and other wildlife species, are hunted, traded, butchered and consumed across Asia, creating a largescale human-wildlife interface, and high risk of future emergence of novel CoVs. To understand the risk of zoonotic CoV emergence, we propose to examine 1) the transmission dynamics of bat-CoVs across the human-wildlife interface, and 2) how this process is affected by CoV evolutionary potential, and how it might force CoV evolution. We will assess the nature and frequency of contact among animals and people in two critical human-animal interfaces: live animal markets in China and people who are highly exposed to bats in rural China. In the markets we hypothesize that viral emergence may be accelerated by heightened mixing of host species leading to viral evolution, and high potential for contact with humans. In this study, we propose three specific aims and will screen free ranging and captive bats in China for known and novel coronaviruses; screen people who have high occupational exposure to bats and other wildlife; and examine the genetics and receptor binding properties of novel bat-CoVs we have already identified and those we will discover. We will then use ecological and evolutionary analyses and predictive mathematical models to examine the risk of future bat-CoV spillover to humans. This work will follow 3 specific aims:

**Specific Aim 1: Assessment of CoV spillover potential at high risk human-wildlife interfaces.** We will examine if: 1) wildlife markets in China provide enhanced capacity for bat-CoVs to infect other hosts, either via evolutionary adaptation or recombination; 2) the import of animals from throughout Southeast Asia introduces a higher genetic diversity of mammalian CoVs in market systems compared to within intact ecosystems of China and Southeast Asia; We will interview people about the nature and frequency of contact with bats and other wildlife; collect blood samples from people highly exposed to wildlife; and collect a full range of clinical samples from bats and other mammals in the wild and in wetmarkets; and screen these for CoVs using serological and molecular assays.

**Specific Aim 2: Receptor evolution, host range and predictive modeling of bat-CoV emergence risk.** We propose two competing hypotheses: 1) CoV host-range in bats and other mammals is limited by the phylogenetic relatedness of bats and evolutionary conservation of CoV receptors; 2) CoV host-range is limited by geographic and ecological opportunity for contact between species so that the wildlife trade disrupts the 'natural' co-phylogeny, facilitates spillover and promotes viral evolution. We will develop CoV phylogenies from sequence data collected previously by our group, and in the proposed study, as well as from Genbank. We will examine co-evolutionary congruence of bat-CoVs and their hosts using both functional (receptor) and neutral genes. We will predict host-range in unsampled species using a generalizable model of host and viral ecological and phylogenetic traits to explain patterns of viral sharing between species. We will test for positive selection in market vs. wild-sampled viruses, and use data to parameterize mathematical models that predict CoV evolutionary and transmission dynamics. We will then examine scenarios of how CoVs with different transmissibility would likely emerge in wildlife markets.

**Specific Aim 3: Testing predictions of CoV inter-species transmission.** We will test our models of host range (i.e. emergence potential) experimentally using reverse genetics, pseudovirus and receptor binding assays, and virus infection experiments in cell culture and humanized mice. With bat-CoVs that we've isolated or sequenced, and using live virus or pseudovirus infection in cells of different origin or expressing different receptor molecules, we will assess potential for each isolated virus and those with receptor binding site sequence, to spill over. We will do this by sequencing the spike (or other receptor binding/fusion) protein genes from all our bat-CoVs, creating mutants to identify how significantly each would need to evolve to use ACE2, CD26/DPP4 (MERS-CoV receptor) or other potential CoV receptors. We will then use receptor-mutant pseudovirus binding assays, in vitro studies in bat, primate, human and other species' cell lines, and with humanized mice where particularly interesting viruses are identified phylogenetically, or isolated. These tests will provide public health-relevant data, and also iteratively improve our predictive model to better target bat species and CoVs during our field studies to obtain bat-CoV strains of the greatest interest for understanding the mechanisms of cross-species transmission.



**B.1.a Have the major goals changed since the initial competing award or previous report?**

No

**B.2 WHAT WAS ACCOMPLISHED UNDER THESE GOALS?**

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**B.3 COMPETITIVE REVISIONS/ADMINISTRATIVE SUPPLEMENTS**

For this reporting period, is there one or more Revision/Supplement associated with this award for which reporting is required?

No

**B.4 WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROJECT PROVIDED?**

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**B.5 HOW HAVE THE RESULTS BEEN DISSEMINATED TO COMMUNITIES OF INTEREST?**

1. Conference and University Lectures: PI Daszak and Co-investigators Shi, Epstein, Olival, and Zhang gave invited conference and university lectures at The US-China Dialogue on the Challenges of Emerging Infections, Laboratory Safety and Global Health Security in Galveston, US; the US-China Workshop on Frontiers in Ecology and Evolution of Infectious Diseases in Berkeley, US and Shenzhen, China; the Sino-Germany symposium "Globalization-Challenge and Response for Infectious Diseases" in Hamburg, Germany; the 8th International Symposium on Emerging Viral Diseases in Wuhan, China; the Global Virome Project meeting, Bangkok, Thailand; the Western Asia Bat Research Network (WAB-Net) workshop, Tbilisi, Georgia; the International Conference on Emerging Infectious Diseases (ICEID), Atlanta, US; the North American Society for Bat Research (NASBR) Conference, Puerto Vallarta, Mexico; and the 3rd Symposium of Biodiversity and Health in Southeast Asia, Chiayi, Taiwan
2. Agency and other briefing: PI Daszak and Co-investigators Shi, Olival presented this project at the Cary Institute for Ecosystem Studies, New York, US; the National Institute for Viral Disease Control and Prevention, China CDC; the Chinese Academy of Sciences; and the Chinese Academy of Medical Sciences
3. Public outreach: PI Daszak and Co-investigator Shi, Epstein, Olival, have presented this work to the general public in a series of meetings over Year 5 including at a Cosmos Club briefing that EcoHealth Alliances hosts in Washington DC, multiple meetings of the China National Virome Project and the Global Virome Project in China, Europe, Australia, Southeast Asia and Latin America. As in Year 4, Co-Investigator Zhu introduced this work to the conservation and ecological research community in China through field training workshops.

**B.6 WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?**

Not Applicable

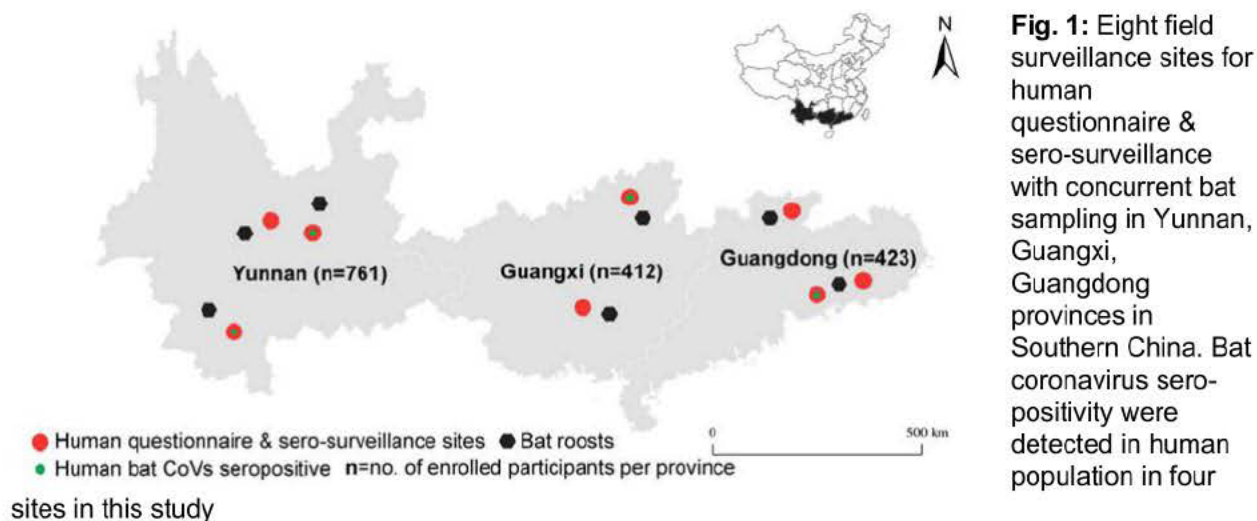
The results of the 5<sup>th</sup> year of our R01 work are detailed below. They include:

### **Specific Aim 1: Assessment of CoV spillover potential at high-risk human-wildlife interfaces**

During Year 5, we finalized the analysis of both quantitative and qualitative data from human surveillance in three provinces in Southern China: Yunnan, Guangxi, and Guangdong provinces.

#### **1.1 High-risk human-animal interaction increase bat coronavirus spillover potential among rural residents in southern China**

We conducted a cross-sectional biological behavioral surveillance in Yunnan, Guangxi, and Guangdong provinces from 2015 to 2017. From 8 study sites, a total of 1,596 residents were enrolled, of these, 1,585 participants completed the questionnaires and 11 participants withdrew from the questionnaire interview due to personal schedule reasons. After the interviews, 1,497 participants provided biological samples for lab analysis (**Fig. 1**).



##### *1.1.1 Demographics*

There were more female (62%) than male (38%) from the communities participated in this study. Most participants were adults over 45 years old (69%) and had been living in the community for more than 5 years (97%) with their family members (95%). A majority relied on a comparatively low family annual per capita income less than 10,000 RMB (86%), which is below the national level of per capita disposable income of rural households from 2015 to 2017. Most participants (98%) had not received a higher education from college and were making a living on crop production (76%). 9% of the participants frequently traveled outside the county as migrant laborers. Some participants were working in sectors where frequent human-animal contacts occur, such as the animal production business (1.7%), wild animal trade (0.5%), slaughterhouses or abattoirs (0.5%), protected nature reserve rangers (0.4%) or in wildlife restaurants (0.3%). It was common for participants to have multiple part-time jobs as income sources (**Table 1**).

Variable	Total	
	N	Valid %
<b>Gender (n= 1,574)</b>		
Female	968	61.5
Male	605	38.4
Other	1	0.1
<b>Age (n=1,582)</b>		
Under 18 years	71	4.5
18 to 44 years	420	26.5
45 to 64 years	780	49.3
Age 65 or older	311	19.7
<b>Province (n=1,585)</b>		
Guang Dong	420	26.5
Guang Xi	412	26.0
Yun Nan	753	47.5
<b>Time of residence (n=1,568)</b>		
< 1 month	4	0.3
1 month – 1 year	12	0.8
1 year – 5 years	26	1.7
> 5 years	1,526	97.3
<b>Family annual per capita income (RMB) (n=1,565)</b>		
<1000	271	17.3
1001-10000	1067	68.2
>10000	227	14.5
<b>Activities to earn livelihood since last year</b>		
Extraction of minerals, gas, oil, timber (n=1,566)	5	0.3
Crop production (n=1,569)	1,196	76.2
Wildlife restaurant business (n=1,564)	5	0.3
Wild/exotic animal trade/market business (n=1,566)	8	0.5
Rancher/farmer animal production business (n=1,566)	27	1.7
Meat processing, slaughterhouse, abattoir (n=1,567)	8	0.5
Zoo/sanctuary animal health care (n=1,565)	1	0.1
Protected area worker (n=1,567)	7	0.4
Hunter/trapper/fisher (n=1,565)	3	0.2
Forager/gatherer/non-timber forest product collector (n=1,566)	4	0.3
Migrant laborer (n=1,567)	144	9.2
Nurse, doctor, healer, community health worker (n=1567)	7	0.4
Construction (n=1,564)	41	2.6
Other (n=1,568)	293	18.7
<b>Highest level of education you completed (n=1,570)</b>		
None	428	27.3
Primary School	632	40.3
Secondary school/Polytechnic school	479	30.5
College/university/professional	31	2.0
<b>Live with family (n=1,564)</b>		
No	73	4.7
Yes	1491	95.3

**Table 1:** Demographics of study participants. Total counts differ due to missing responses.

### 1.1.2 Animal contact and exposure to bat coronaviruses

Serological testing of serum samples from 1,497 local residents revealed 9 individuals (0.6%) were positive for bat coronavirus, indicating exposure at any point in their life to bat-born SARS-related Coronavirus (n=7, Yunnan) and HKU10 Coronavirus (n=2, Guangxi), or other coronaviruses that are phylogenetically closely related to these two coronaviruses (Table 2). All individuals who tested positive (male=6, female=3) were over 45 years old, and most (n=8)

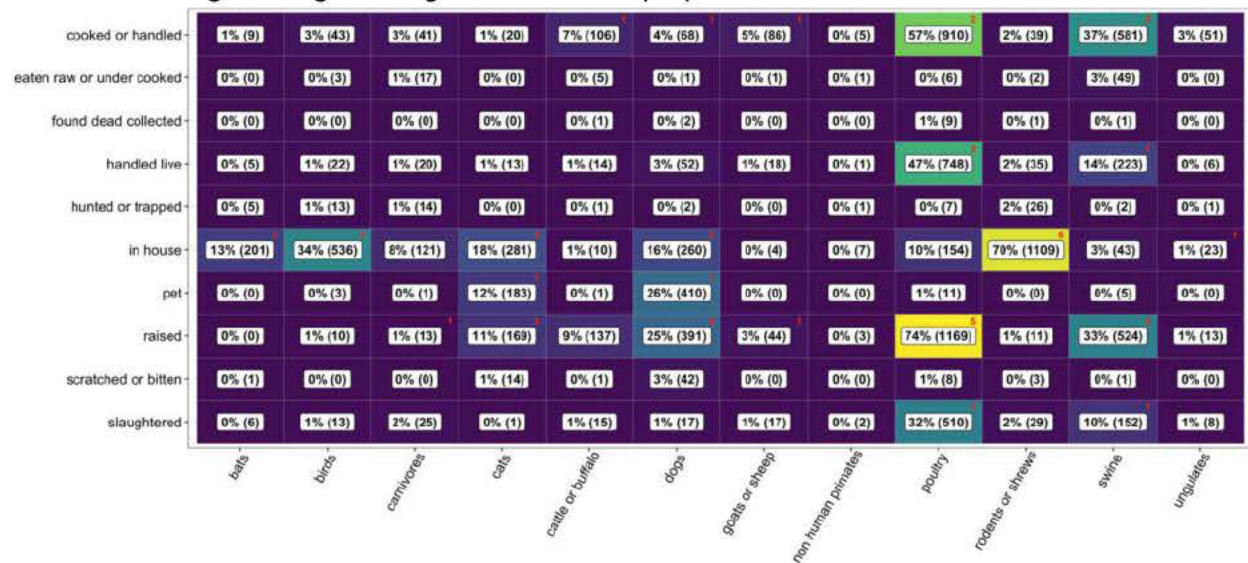


were making a living from crop production. None of those participants reported any symptoms in the preceding 12 months in the interview.

Site	# tested	Bat CoV + (%)	SARSr-CoV Rp3 + (%)	HKU10 + (%)	HKU9 + (%)	MERS-CoV+ (%)
Jinning, Yunnan	209	6 (2.87)	6 (2.87)	-	-	-
Mengla, Yunnan	168	1 (0.6)	1 (0.6)	-	-	-
Jinghong, Yunnan	212	-	-	-	-	-
Lufeng, Yunnan	144	-	-	-	-	-
Guangdong	420	-	-	-	-	-
Guangxi	412	2 (0.48)	-	2 (0.48)	-	-

**Table 2:** ELISA testing of human sera for 4 bat CoVs

Due to the low rate of sero-positivity, we did not conduct statistical comparisons of animal-contact behavior by coronavirus outcome. Figure 2 shows animal contact rates among the survey population (n= 1,585) and among sero-positive individuals (n=9). Participants reported common contact with poultry and rodents/shrews, and most animal contact occurred in domestic settings through raising animal or food preparation activities.



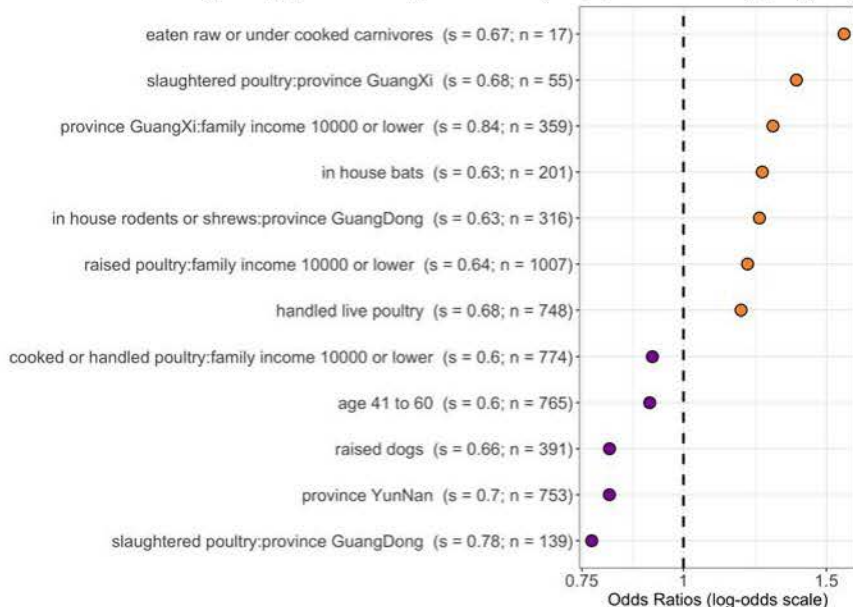
**Fig. 2:** Animal contact by taxa and activities. Values and shading represent survey population; red numbers in upper-right corners of cells indicate the number of sero-positive individuals with the given contact.

### 1.1.3 Self-report SARI/ILI symptoms and animal contact

Among the 1,565 participants who responded, 17% (n=265) had experienced fever with cough and shortness of breath or difficulty breathing (38, 14%), indicative of severe acute respiratory infection (SARI), or fever with muscle aches; cough, or sore throat (192, 72%), indicative of influenza like illness (ILI), or both symptoms (35, 13%) in the past 12 months.

LASSO analyses of the associations between animal contact and self-report SARI or ILI symptoms showed that eating raw or undercooked carnivores (OR = 1.6; bootstrap support = 0.67) was the most salient predictor of experiencing SARI or ILI symptoms, followed by slaughtering poultry as a resident of Guangxi province (OR = 1.4; support = 0.68); having an income below 10,000 as a resident of Guangxi province (OR = 1.3; support = 0.84); domestic

contact with bats (OR = 1.3 ; support = 0.63) and domestic contact with rodents or shrews as a resident of Guangdong province (OR = 1.2; support = 0.63) (**Fig. 3**).



**Fig. 3:** Most salient predictors of self-reported ILI and/or SARI symptoms in the last year (s = bootstrap support; n = count positive out of 1585 respondents). Bootstrap support values = 0.6 are demonstrated here meaning they were identified as associated with the outcome for 60% or more of the bootstrap iterations. Odds ratios > 1 (orange) are positively associated with the outcome, and odds ratios < 1 (purple) are negatively associated with the outcome.

This study provides serological evidence of subclinical or asymptomatic bat-born SARS-related Coronavirus and HKU10 Coronavirus spillover event(s) in rural communities in Southern China, highlights the associations between human-animal interaction and zoonotic spillover risk. The rate of seropositivity observed in this study is clearly lower than would be seen for established human infections. However it has important implications for predicting and preventing pandemics:

1. It indicates that spillover of novel bat-CoVs is detectable if populations that live within areas inhabited by likely bats hosts are targeted. **This provides a pathway to identify spillover events rapidly, perhaps even before a SARS-like disease can become established in people;**
2. It allows us to calculate the likely number of people infected by novel bat SARSr-CoVs annually in this region. Our preliminary analyses suggest that if similar seroprevalence occurs in human populations across the region bat SARSr-CoV hosts inhabit, **there may be as many as the low hundreds of thousands to over a million people infected each year in South China and Southeast Asia.** We aim to conduct a detailed analysis of this in the future.
3. It highlights ways to refine surveillance that could help prevent pandemics, by targeting populations where seroprevalence suggests that they are **at higher risk due to behavioral preferences (e.g. wildlife hunting, farming, or trading)** or where **early-stage SARS-like illnesses could be identified using syndromic surveillance of clinics.**

Contact with poultry and rodents/shrews were commonly reported among participants and associated with self-reported ILI and/or SARI symptoms, which suggests that domestic animals, in addition to wildlife, are an important link in understanding the coronavirus transmission from bat to human populations, indirect exposure might occur through contact with live domestic animals in house or market when the animals had prior exposure to bat coronavirus.

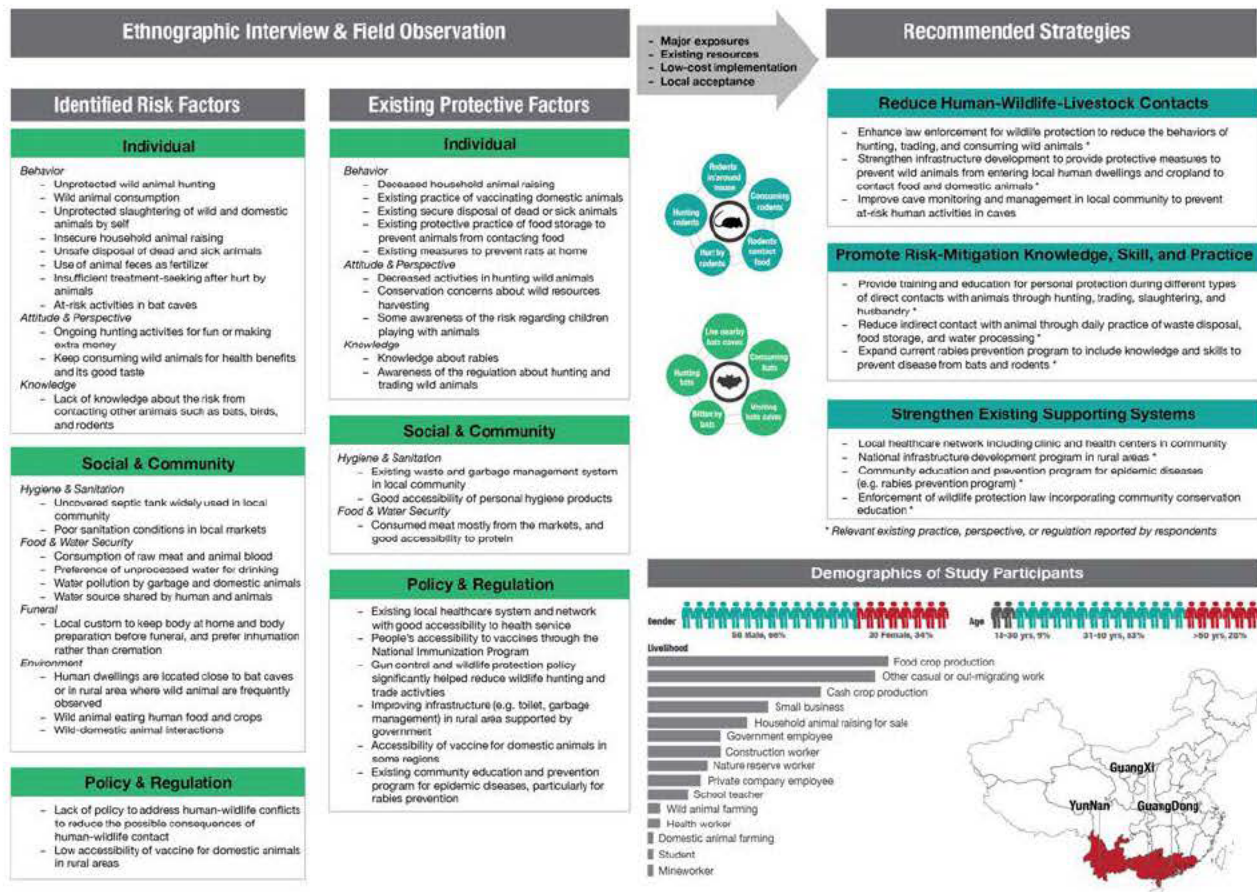


When clinical evidence is limited, undiagnosed or subclinical symptoms similar to SARI and ILI in a population should be brought to our attention as indicators in monitoring zoonotic pathogen spillover events, and considered for prevention strategies. This is particularly important in rural community settings, where people have a higher level of exposure to both domestic and wild animals, but may not seek diagnosis or treatment in a timely fashion, thus slowing the processes of early detection and response.

### 1.2 Qualitative Approach to Developing Zoonotic Risk Mitigation Strategies in Southern China

To explore the potential drivers of zoonotic exposure and the opportunities for intervention, we conducted field observation and semi-structured ethnographic interviews among 88 community members who have frequent exposure to wildlife and domestic animals and/or have extensive local knowledge in 9 sites in Yunnan, Guangdong, and Guangxi provinces.

The majority of participants in this study were adults between 31 to 50 years of age, residing in rural or suburban areas. Most earned their livelihoods from multiple sources, primarily in crop production, subsistence animal farming, small business, and other temporary jobs as migrant workers. Risk and protective factors were identified at the individual, community, and policy levels regarding potential zoonosis exposures, recommending risk-mitigation strategies with the strengthened policy enforcement and multi-sectoral collaboration among human, animal, and environment health programs (Fig. 4).



**Fig. 1:** Community Zoonosis Exposure Risk Mitigation Strategy Development Process. Leveraging ethnographic interview and observational research data to identify risk and protective factors and develop risk-mitigation recommendations

This demonstrated a qualitative approach to understand the zoonotic risks in community, and provided guidance for future research and interventions with focused potential zoonotic risks for disease control and prevention in southern China and a broader area with similar ecological, culture, and demographic contexts.

## **Specific Aim 2: Receptor evolution, host range and predictive modeling of bat-CoV emergence risk**

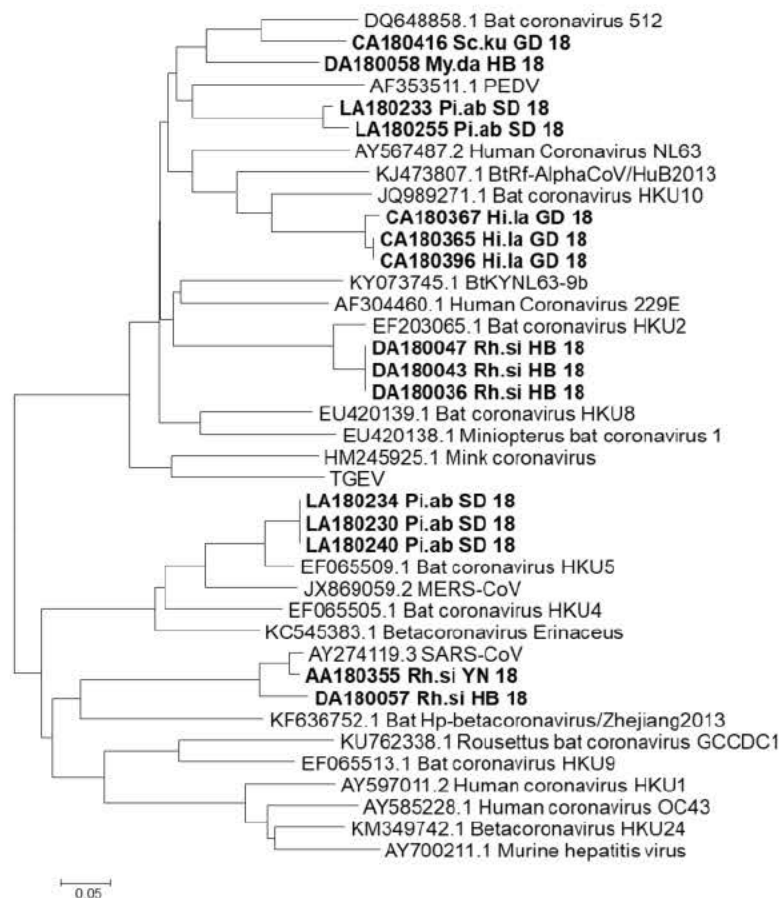
### **2.1 Bat CoV PCR detection and sequencing from live-sampled bat populations**

From May to October 2018, we collected 1,697 rectal swabs, oral swabs, and feces specimens from 26 bat species in Hubei, Shandong, Yunnan and Guangdong Provinces across southern, central and northern China in Year 5, all specimen were tested for CoV RNA and 109 (6.4%) were positive. SARS-related coronaviruses were discovered in *Rhinolophus sinicus* samples from Yunnan and Hubei provinces while HKU2-related coronaviruses were detected in *R. sinicus* from Hubei. HKU5-related and HKU10-related coronaviruses were identified in *Pipistrellus abramus* from Shandong and *Hipposideros larvatus* from Guangdong, respectively. *Scotophilus* coronavirus 512 was detected in Guangdong. Additionally, two novel *Pipistrellus* alphacoronaviruses were found in Shandong province in northern China (**Fig. 5**).

**Fig. 2:** Phylogenetic analysis of partial RdRp gene of CoV (440-nt partial sequence)

### **2.2 Bat coronavirus host-virus phylogeography in China**

Our dataset includes all CoV RdRp sequences isolated from bat specimens collected by our team from 2008-2015 (Alpha-CoVs:  $n = 491$  – Beta-CoVs:  $n = 326$ ), including those collected under prior NIAID funding (1 R01 AI079231), and funding from Chinese Federal Agencies. All Chinese bat CoV RdRp sequences available in GenBank were also added to

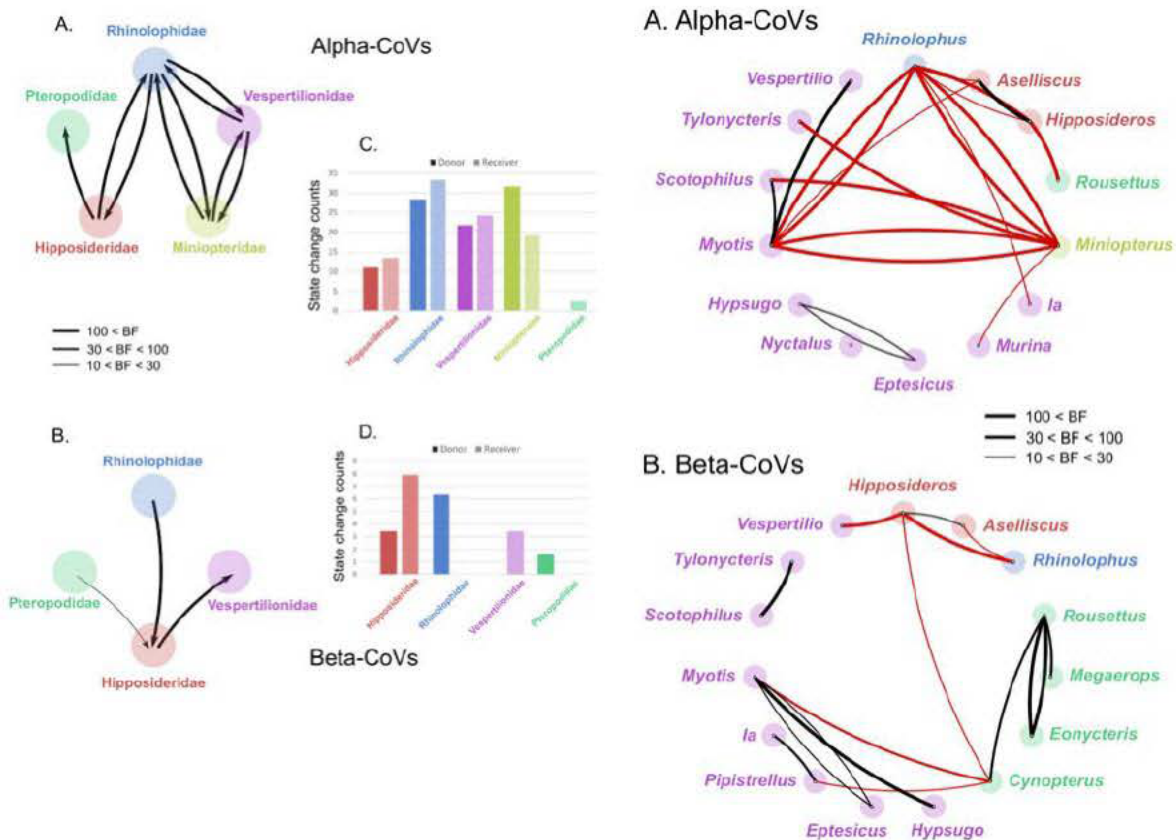




our dataset (Alpha-CoVs:  $n = 226$  – Beta-CoVs:  $n = 206$ ). Phylogenetic trees were reconstructed for Alpha- and Beta-CoVs separately using Bayesian inference (BEAST 1.8).

### 2.2.1 Ancestral hosts and cross-species transmission

We used ancestral character state reconstruction and a Bayesian stochastic search variable selection (BSSVS) to identify host switches between bat families (**Fig. 6**) and genera (**Fig. 7**) that occurred along the branches of the phylogenetic tree and calculated BF to estimate the significance of these non-zero transition rates. We identified nine and three highly supported ( $BF > 10$ ) **inter-family** host transition rates for alpha- and beta-CoVs, respectively (**Figs. 6A and 6B**). To quantify the intensity of these host switches, we estimated the number of state changes (Markov jumps) along the significant inter-family transition rates (**Figs. 6C and 6D**). The total estimated number of inter-family host jump events was more than eight times higher in the evolutionary history of alpha- ( $n = 90$ ) than beta-CoVs ( $n = 11$ ) in China. Host transition events from Rhinolophidae and Miniopteridae were greater than from other families for alpha-CoVs while Rhinolophidae were the highest donor family for beta-CoVs. Rhinolophidae and Hipposideridae were the families receiving the highest numbers of transition events for alpha- and beta-CoVs, respectively (**Figs. 6C and 6D**).



**Figure 3:** Non-zero transition rates between bat families for alpha- (**A**) and beta-CoVs (**B**) and their significance level (Bayes factor, BF),  $BF < 10$  are considered as non-significant. Arrows indicate the direction of the transition; arrow thickness is proportional to the transition significance level. Histograms show total number of state changes (Markov jumps) from/to each bat family along the significant inter-family transition rates for alpha- (**C**) and beta-CoVs (**D**).

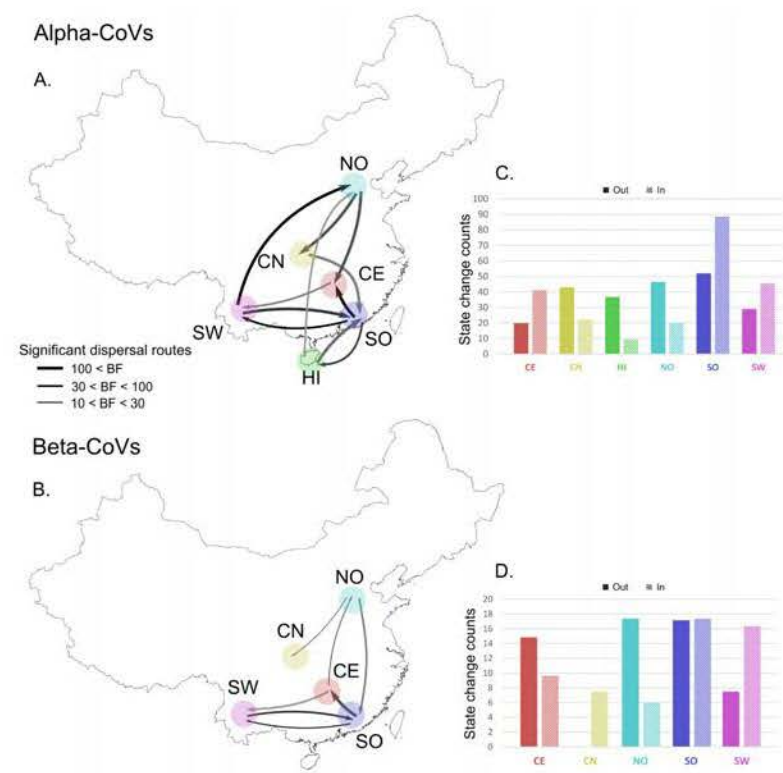
**Figure 4:** Non-zero transition rates between bat genera for alpha- (A) and beta-CoVs (B) and their significance level (Bayes factor, BF), BF < 10 are considered as non-significant. Lines with a rightward curvature depict transitions from that bat genus, while lines with leftward curvature depict transition to that bat genus. Inter-family transitions are highlighted in red.

At the genus level, we identified 20 highly supported inter-genus host transition rates for alpha-CoVs (Fig. 7A). *Rhinolophus* and *Myotis* were the donor genera in four of these transitions while *Miniopterus* and *Rhinolophus* were each the recipients of four of these transitions (Fig. 7A). Sixteen highly supported inter-genus transition rates were identified for beta-CoVs (Fig. 7B). Four of these 16 host switches originated in *Cynopterus* while three of them ended in *Myotis* (Fig. 7B). Fifteen out of the 20 significant pairwise host transitions (75%) for alpha-CoVs involved two genera belonging to different bat families, while this proportion is only 6/16 (37.5%) for beta-CoVs. This confirmed the highest number of inter-family host transitions for alpha-CoVs. The estimated total number of inter-genus host switches was almost two times higher for alpha- (n = 123) than beta-CoVs (n = 70).

These findings indicate that alpha-CoVs were able to switch hosts more frequently and between more distantly related taxa during their evolution and suggest that phylogenetic distance among hosts represents higher constraint on host switches for beta- than alpha-CoVs.

### 2.2.2 CoV spatiotemporal dispersal in China

We also used our Bayesian discrete phylogeographic model using zoogeographic regions as character states to reconstruct the spatiotemporal dynamics of CoV dispersal in China. Eleven and seven highly significant (BF > 10) dispersal routes within China were identified for alpha- and beta-CoVs, respectively (Fig. 8A and 8B). The Rhinacovirus lineage that includes HKU2 and SADS-CoV likely originated in SO region while all other alpha-CoV lineages likely arose in SW China and spread to other regions before several dispersal events occurred from SO and NO in all directions (Fig. 8A).



**Fig. 8:** Significant dispersal routes among China zoogeographic regions for alpha- (A) and beta-CoVs (B). Arrows indicate the direction of the transition; arrow thickness is proportional to the transition significance level. Darker arrow colors indicate older dispersal events. Fig. 8 (C & D) Histograms of total number of state changes (Markov jumps) from/to each region along the significant dispersal routes for alpha- (C) and beta-CoVs (D). NO, Northern region; CN, Central northern region; SW, South western region; CE, Central region; SO, Southern region; HI, Hainan island.

The oldest inferred dispersal movements among beta-CoVs occurred among SO and SW regions (Fig. 8B). SO region is the likely origin of Merbecovirus (Lineage C, including HKU4 and



HKU5) and Sarbecovirus subgenera (Lineage B, including HKU 3 and SARS-related CoVs) while Nobecovirus (lineage D) and Hibecovirus (lineage E) subgenera originated in SW China. Then several dispersal movements likely originated from SO and CE (**Fig. 8B**). More recent southward dispersal from NO was observed.

The estimated total number of migration events along these significant dispersal routes is four times higher for alpha- ( $n = 227$ ) than beta-CoVs ( $n = 57$ ). SO has the highest number of outbound and inbound migration events for alpha-CoVs (**Fig. 8C**). For beta-CoVs, the highest numbers of outbound migration events have been estimated from NO and SO while SO and SW have the highest numbers of inbound migration events (**Fig. 8D**).

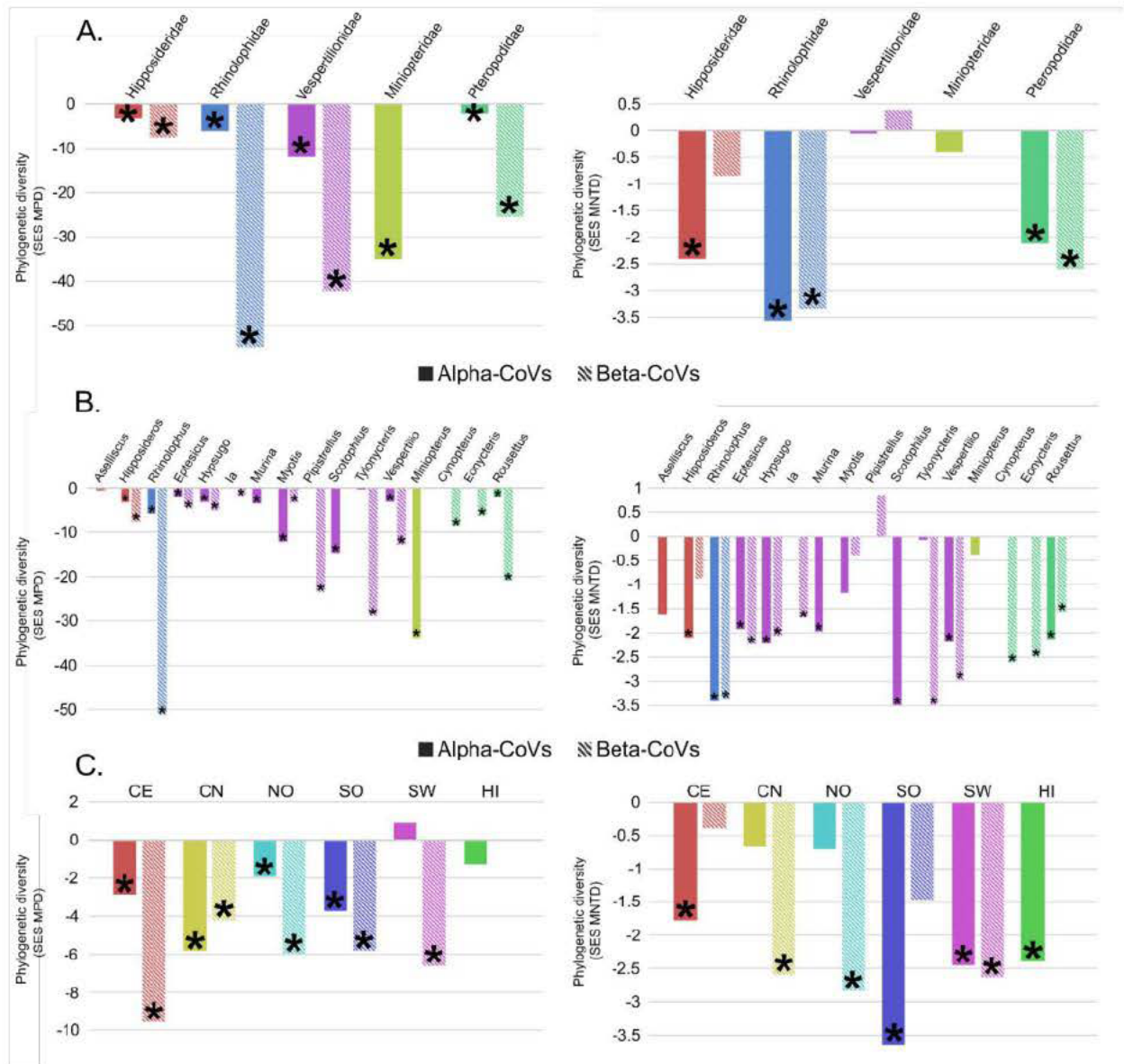
Our Bayesian ancestral reconstructions revealed the high importance of South western and Southern China as centers of diversification for both alpha- and beta-CoVs. These two regions are clearly hotspots of CoV phylo-diversity, harboring evolutionary old and phylogenetically diverse lineages of alpha- and beta- CoVs.

### 2.2.3 Phylogenetic diversity

In order to quantitatively evaluate the diversity and the clustering process in our phylogenies, the Mean Phylogenetic Distance (MPD) and the Mean Nearest Taxon Distance (MNTD) statistics and their standardized effect size (SES) were calculated for each zoogeographic region, bat family and genus. The SES corresponds to the difference between the phylogenetic distances in the observed communities versus null communities built by randomly reshuffling tip labels 1000 times along the entire phylogeny. Low and negative SES values denote phylogenetic clustering, high and positive values indicate phylogenetic over-dispersion while values close to 0 show random dispersion.

Significant negative SES MPD values ( $p < 0.05$ ), indicating basal phylogenetic clustering, were observed within all bat families and genera for both alpha- and beta-CoVs, except within *Aselliscus* and *Tylonycteris* for alpha-CoVs (**Figs. 9A & B**). Negative and mostly significant SES MNTD values, reflecting phylogenetic structure closer to the tips, were also observed within most bat families and genera for alpha- and beta-CoVs but we found non-significant positive SES MNTD value for Vespertilionidae and *Pipistrellus* for beta-CoVs (Fig. 4A and 4B). In general, we observed lower phylogenetic diversity for beta- than alpha-CoVs within all bat families and most genera when looking at SES MPD, while similar level of diversity are observed when looking at SES MNTD (**Figs. 9A & B**). These results suggest stronger basal clustering (at the deeper nodes) for beta-CoVs than alpha-CoVs.

Chinese zoogeographic regions don't harbor a random set of CoVs as alpha- and beta-CoV strains within most regions are more closely related than expected by chance as denoted by negative and mostly significant values of MPD and MNTD (**Fig. 9C**). However, positive SES MPD value for alpha-CoVs in SW indicate wider evolutionary diversity in that region (**Fig. 9C**).



**Fig. 9:** CoV phylogenetic diversity bat families (A), genera (B), and zoogeographic regions (C): SES MPD, standardized effect size of Mean Phylogenetic Distance (Left); and SES MNTD, standardized effect size of Mean Nearest Taxon Distance (Right). Values departing significantly from null model (p-value < 0.05) indicated with an asterisk. NO, Northern region; CN, Central northern region; SW, South western region; CE, Central region; SO, Southern region; HI, Hainan island.

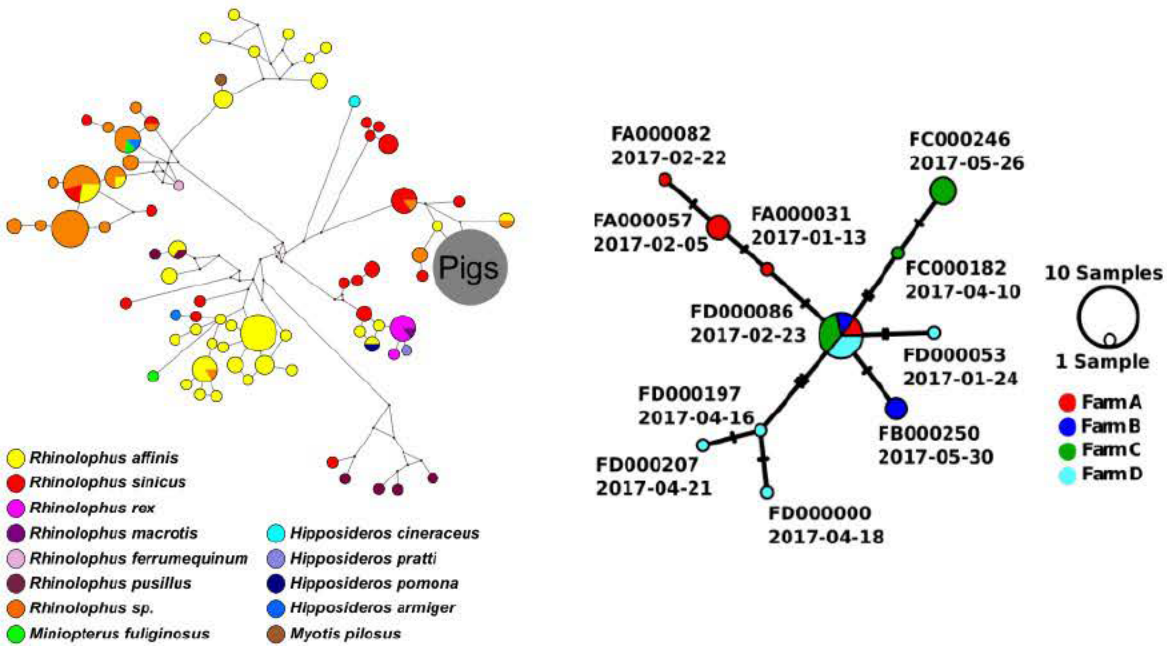
### 2.3 Characterization of SADSr-CoV coronaviruses diversity and distributions

In previous project years, our team identified and characterized Swine Acute Diarrheal Syndrome coronavirus (SADS-CoV), a novel swine virus causing outbreaks in farms in multiple Chinese provinces. In this year, we were able to identify SADS-related CoVs in bats from our wild bat sampling. In >17,000 bat and other mammals at 47 sites across southern China, we found 78 new SADSr-CoVs<sup>11</sup>, all in 9 bat species, with mean prevalence of 0.1 to 37.5%.

Our phylogenetic analysis suggests that pig SADS-CoV recently spilled over from *R. sinicus* or *R. affinis* bats (Fig. 10 Left) However, analysis of full pig viral genomes from 4 initially infected



farms suggests that either the virus evolved as it circulated or that multiple spillover events occurred (**Fig. 10 Right**).



**Fig. 10:** **Left:** Median joining network of conserved RdRp gene fragment of 198 unique SADSr-CoV sequences discovered in China under our previous funding. Size of circle proportional to the number specimens with identical viral sequences. **Right:** Median joining network of SADS-CoV full genome sequence data from 4 infected pigs farms in S. China.

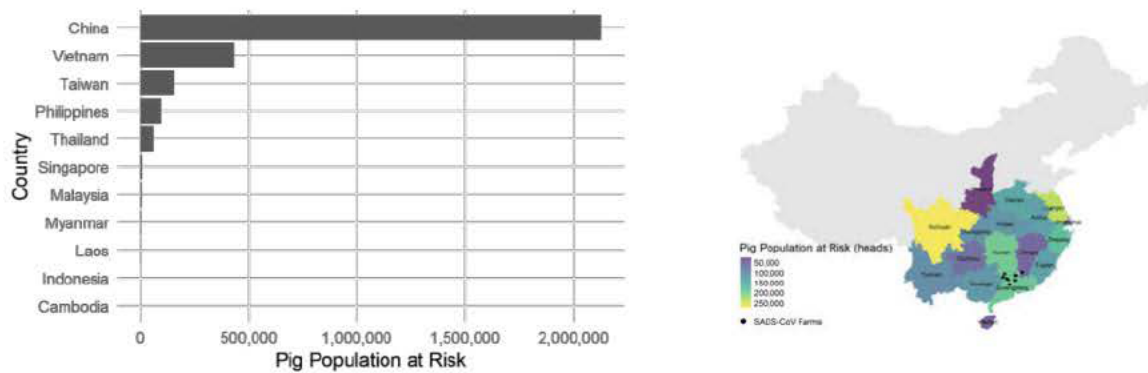
We built species distribution models of the major bat species hosts of SADSr-CoVs across southeast Asia to determine the areas where their ranges intersect with large swine operations similar to those of the original outbreak. We found that these are Southern China (including Taiwan), throughout Vietnam, the Philippines, and Thailand. Compared to other countries,



pig farming (>100 heads per km<sup>2</sup>).

China had the largest area of bat-pig overlap with 329,847 km<sup>2</sup> (3.4% of total country area) and 2,127,006 pigs located within predicted bat distributions. By Chinese province, the largest area of overlap was found in Jiangsu (35,226 km<sup>2</sup> amounting to 34.3% of the province's area and 242,299 pigs within this area). Sichuan had the largest pig population at risk (the pig population within an area that intersects with predicted bat occurrence), at 274,353 heads over 26,015 km<sup>2</sup> (5.4% of the total area of the province) (**Figs. 11 & 12**).

**Fig. 5:** Areas of bat-pig overlap where probability of SADS-CoV *Rhinolophus* spp. reservoir occurrence is high (>75%) and pig densities are indicative of intensive



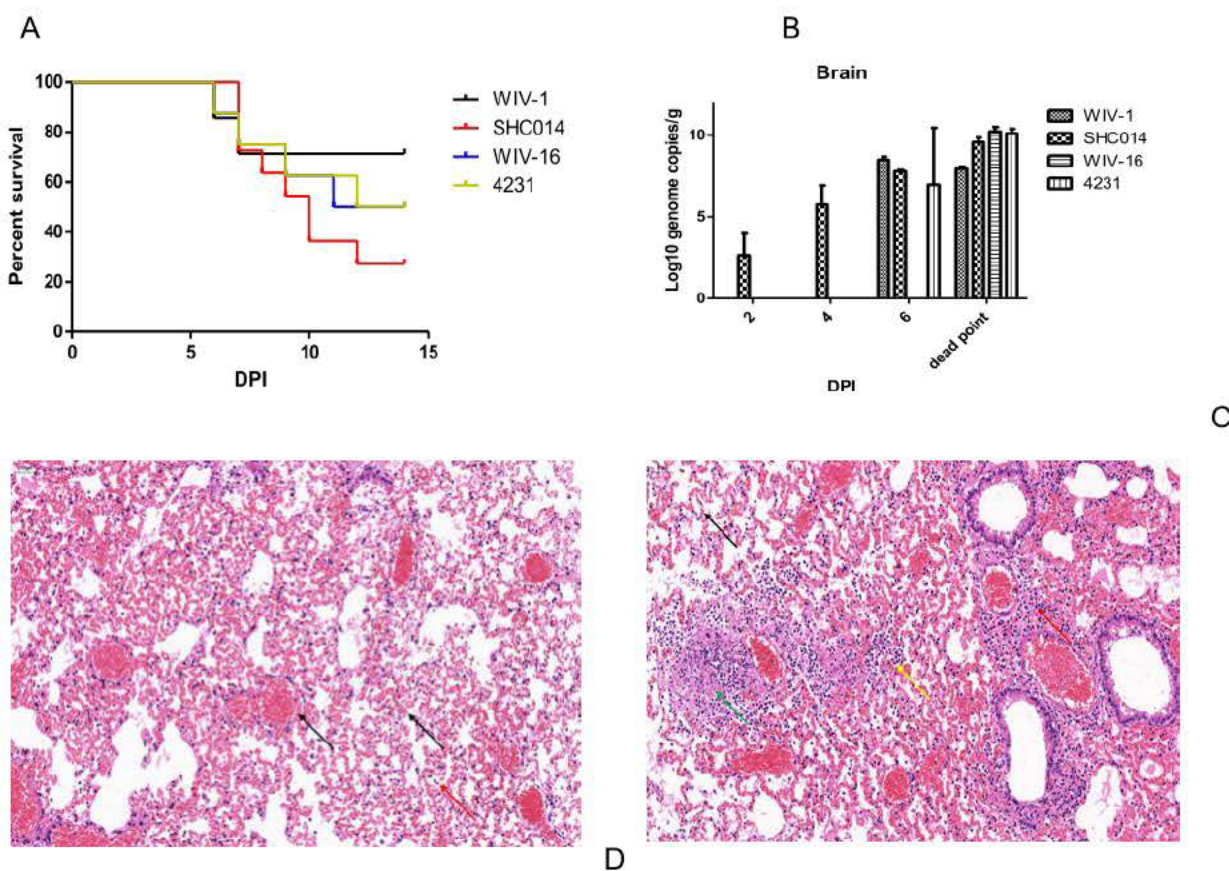
**Fig. 6: Top:** Country-level, and **Bottom:** province-level estimate of swine populations at-risk based on overlap between modeled populations of bat species known to be SADSr-CoV hosts and large swine operations.

### Specific Aim 3: Testing Predictions of CoV Inter-Species Transmission

#### 3.1 *In vivo* infection of Human ACE2 (hACE2) expressing mice with SARSr-CoV S protein variants

In Year 5, we continued with *in vivo* infection experiments of diverse bat SARSr-CoVs on transgenic mice expressing human ACE2. Mice were infected with 4 strains of SARSr-CoVs with different S protein, including the full-length recombinant virus of SARSr-CoV WIV1 and three chimeric viruses with the backbone of WIV1 and S proteins of SHC014, WIV16 and Rs4231, respectively. Pathogenicity of the 4 SARSr-CoVs was evaluated by recording the survival rate of challenged mice in a 2-week course. All of the 4 SARSr-CoVs caused lethal infection in hACE2 transgenic mice, but the mortality rate vary among 4 groups of infected mice (**Fig. 13a**). 14 days post infection, 5 out of 7 mice infected with WIV1 remained alive (71.4%), while only 2 of 8 mice infected with rWIV1-SHC014 S survived (25%). The survival rate of mice infected with rWIV1-WIV16S and rWIV1-4231S were 50%. Viral replication was confirmed by quantitative PCR in spleen, lung, intestine and brain of infected mice. In brain, rWIV1, rWIV1-WIV16S and rWIV1-4231S cannot be detected 2 days or 4 days post infection. However, rWIV1-SHC014 was detected at all time points and showed an increasing viral titer after infection. The viral load reached more than  $10^9$  genome copies/g at the dead point (**Fig. 13b**). We also conducted histopathological section examination in infected mice. Tissue lesion and lymphocytes infiltration can be observed in lung, which is more significant in mice infected with rWIV1-SHC014 S (**Fig. 13d**) than those infected with rWIV1 (**Fig. 13c**). These results suggest that the pathogenicity of SHC014 is higher than other tested bat SARSr-CoVs in transgenic mice that express hACE2.



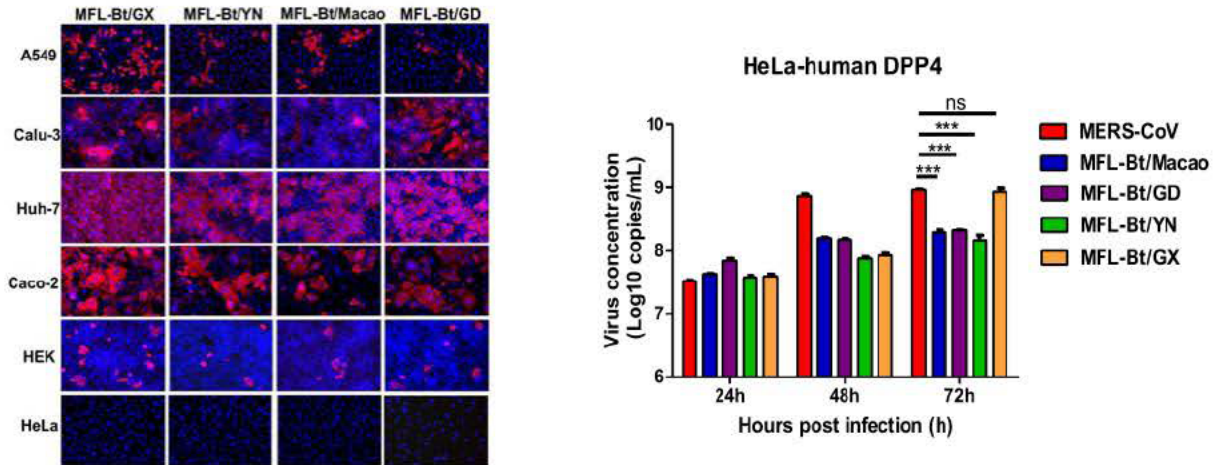


**Fig. 13:** *In vivo* infection of SARSr-CoV in hACE2-expressing mice. **(A)** Survival rate of hACE2\_mice after infection **(B)** Viral load in brains of infected hACE2-expressing mice. **(C)** Histopathological section of lung tissue of mice infected with rWIV1. **(D)** Histopathological section of lung tissue of mice infected with rWIV1-SHC014 S.

### 3.2 Assessment of interspecies transmission risk of bat HKU4-related coronaviruses

Taking a similar reverse genetics strategy that we used in SARSr-CoV studies, we constructed the full-length infectious clone of MERS-CoV, and replaced the RBD of MERS-CoV with the RBDs of various strains of HKU4-related coronaviruses previously identified in bats from different provinces in southern China. The full-length MERS-CoV and chimeric viruses with RBDs of HKU4r-CoVs were then rescued. Immunofluorescence assay showed that these chimeric MERS-HKU4rRBD coronaviruses were able to infect human cells from different tissues including lung, liver, intestine and kidney (**Fig. 14 Left**). Moreover, efficient replication of the chimeric HKU4r-CoVs were detected by real-time PCR in HeLa cells that expressed human DPP4 receptor (**Fig. 14 Right**). The results suggest potential risk of the bat HKU4r-CoVs for cross-species infection in humans.





**Fig. 7: Left:** Immunofluorescence assay confirms Infection of 4 chimeric viruses with the backbone of MERS-CoV and RBD of bat HKU4r-CoVs in different cell lines derived from human tissues. **Right:** Replication of MERS-HKU4rRBD CoVs in HeLa cells expressing human DPP4 was determined by real-time PCR.

1. Conference and University lectures: We continued to provide human subject research trainings to chief physicians and nurses at local clinics, staff from Yunnan Institute of Endemic Diseases Control and Prevention, students from Dali College and Wuhan University for both qualitative and quantitative research.
2. Agency and other briefing: Dr. Guangjian Zhu provided training to 18 field team members from the Dali College and 4 Wuhan Institute of Virology laboratory team members regarding biosafety and PPE use, bats and rodents sampling.
3. Public outreach: PI Daszak, and Co-investigators Shi, Epstein, and Olival presented the Year 5 results of this project to the public via interviews with national central and local television, social media, newspaper and journals in China and the US.

**C. PRODUCTS****C.1 PUBLICATIONS**

Are there publications or manuscripts accepted for publication in a journal or other publication (e.g., book, one-time publication, monograph) during the reporting period resulting directly from this award?

No

**C.2 WEBSITE(S) OR OTHER INTERNET SITE(S)**

NOTHING TO REPORT

**C.3 TECHNOLOGIES OR TECHNIQUES**

NOTHING TO REPORT

**C.4 INVENTIONS, PATENT APPLICATIONS, AND/OR LICENSES**

Have inventions, patent applications and/or licenses resulted from the award during the reporting period? No

If yes, has this information been previously provided to the PHS or to the official responsible for patent matters at the grantee organization? No

**C.5 OTHER PRODUCTS AND RESOURCE SHARING**

NOTHING TO REPORT

### D. PARTICIPANTS

#### D.1 WHAT INDIVIDUALS HAVE WORKED ON THE PROJECT?

Commons ID	S/K	Name	Degree(s)	Role	Cal	Aca	Sum	Foreign Org	Country	SS
(b) (6)	Y	DASZAK, PETER	BS,PHD	PD/PI	(b) (4), (b) (6)					NA
	N	KE, CHANGWEN	PHD	Co-Investigator				Center for Disease Control and Prevention of Guangdong Province	CHINA	NA
	N	ZHANG, YUNZHI	PHD	Co-Investigator				Yunnan Provincial Institute of Endemic Diseases Control & Prevention	CHINA	NA
	N	ZHU, GUANGJIAN	PHD	Co-Investigator				East China Normal University	CHINA	NA
(b) (6)	N	Chmura, Aleksei	BS,PHD	Non-Student Research Assistant						NA
	N	Ross, Noam Martin	PhD	Co-Investigator						NA
	N	Olival, Kevin J.	PHD	Co-Investigator						NA
	N	Zhang, Shu-yi	PHD	Co-Investigator				East China Normal University	CHINA	NA
	N	SHI, ZHENGLI	PhD	Co-Investigator				Wuhan Institute of Virology	CHINA	NA
	N	GE, XINGYI	PHD	Co-Investigator				Wuhan Institute of Virology	CHINA	NA
	N	EPSTEIN, JONATHAN H	MPH,DVM,BA,PHD	Co-Investigator			NA			

**Glossary of acronyms:**

S/K - Senior/Key  
 DOB - Date of Birth  
 Cal - Person Months (Calendar)  
 Aca - Person Months (Academic)  
 Sum - Person Months (Summer)

Foreign Org - Foreign Organization Affiliation

SS - Supplement Support  
 RE - Reentry Supplement  
 DI - Diversity Supplement  
 OT - Other  
 NA - Not Applicable

#### D.2 PERSONNEL UPDATES

##### D.2.a Level of Effort

Not Applicable

**D.2.b New Senior/Key Personnel**

Not Applicable

**D.2.c Changes in Other Support**

Not Applicable

**D.2.d New Other Significant Contributors**

Not Applicable

**D.2.e Multi-PI (MPI) Leadership Plan**

Not Applicable

## E. IMPACT

**E.1 WHAT IS THE IMPACT ON THE DEVELOPMENT OF HUMAN RESOURCES?**

Not Applicable

**E.2 WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL, OR INFORMATION RESOURCES THAT FORM INFRASTRUCTURE?**

NOTHING TO REPORT

**E.3 WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?**

Not Applicable

**E.4 WHAT DOLLAR AMOUNT OF THE AWARD'S BUDGET IS BEING SPENT IN FOREIGN COUNTRY(IES)?**

Dollar Amount	Country
\$66,500	CHINA

## G. SPECIAL REPORTING REQUIREMENTS SPECIAL REPORTING REQUIREMENTS

### G.1 SPECIAL NOTICE OF AWARD TERMS AND FUNDING OPPORTUNITIES ANNOUNCEMENT REPORTING REQUIREMENTS

NOTHING TO REPORT

### G.2 RESPONSIBLE CONDUCT OF RESEARCH

Not Applicable

### G.3 MENTOR'S REPORT OR SPONSOR COMMENTS

Not Applicable

### G.4 HUMAN SUBJECTS

Sub-Project ID	Study ID	Study Title	Delayed Onset	Clinical Trial	NCT	NIH-Defined Phase 3	ACT
	58010	Understanding the Risk of Bat Coronavirus Emergence-PROTOCOL-001	NO	NO		NO	

### G.5 HUMAN SUBJECTS EDUCATION REQUIREMENT

NOT APPLICABLE

### G.6 HUMAN EMBRYONIC STEM CELLS (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

### G.7 VERTEBRATE ANIMALS

Not Applicable

### G.8 PROJECT/PERFORMANCE SITES

Not Applicable

### G.9 FOREIGN COMPONENT

**Organization Name:** Wuhan Institute of Virology

**Country:** CHINA



**Description of Foreign Component:**

Principal Laboratory for all Research in China and detailed in our Specific Aims

**G.10 ESTIMATED UNOBLIGATED BALANCE**

Not Applicable

**G.11 PROGRAM INCOME**

Not Applicable

**G.12 F&A COSTS**

Not Applicable

**Section 1 - Basic Information (Study 58010)**

## 1.1. Study Title \*

Understanding the Risk of Bat Coronavirus Emergence-PROTOCOL-001

## 1.2. Is this study exempt from Federal Regulations \*

 Yes  No

## 1.3. Exemption Number

 1  2  3  4  5  6  7  8

## 1.4. Clinical Trial Questionnaire \*

1.4.a. Does the study involve human participants?

 Yes  No

1.4.b. Are the participants prospectively assigned to an intervention?

 Yes  No

1.4.c. Is the study designed to evaluate the effect of the intervention on the participants?

 Yes  No

1.4.d. Is the effect that will be evaluated a health-related biomedical or behavioral outcome?

 Yes  No

## 1.5. Provide the ClinicalTrials.gov Identifier (e.g. NCT87654321) for this trial, if applicable

**Section 2 - Study Population Characteristics (Study 58010)**

2.1. Conditions or Focus of Study

2.2. Eligibility Criteria

2.3. Age Limits

Min Age:

Max Age:

2.3.a. Inclusion of Individuals Across the Lifespan

2.4. Inclusion of Women and Minorities

2.5. Recruitment and Retention Plan

2.6. Recruitment Status

Not yet recruiting

2.7. Study Timeline

2.8. Enrollment of First Participant (SEE SECTION 6.3)

## 2.9. Inclusion Enrollment Reports

IER ID#	Enrollment Location Type	Enrollment Location
IER 58010	Foreign	

**Inclusion Enrollment Report 58010**

1. Inclusion Enrollment Report Title\* : China Study Report
2. Using an Existing Dataset or Resource\* :  Yes  No
3. Enrollment Location Type\* :  Domestic  Foreign
4. Enrollment Country(ies): CHN: CHINA
5. Enrollment Location(s):
6. Comments:

**Planned**

Racial Categories	Ethnic Categories				Total
	Not Hispanic or Latino		Hispanic or Latino		
	Female	Male	Female	Male	
American Indian/ Alaska Native	0	0	0	0	0
Asian	1230	1230	0	0	2460
Native Hawaiian or Other Pacific Islander	0	0	0	0	0
Black or African American	0	0	0	0	0
White	0	0	0	0	0
More than One Race	0	0	0	0	0
<b>Total</b>	1230	1230	0	0	2460

**Cumulative (Actual)**

Racial Categories	Ethnic Categories									Total
	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			
	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	
American Indian/ Alaska Native	0	0	0	0	0	0	0	0	0	0
Asian	980	616	0	0	0	0	0	0	0	1596
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African American	0	0	0	0	0	0	0	0	0	0
White	0	0	0	0	0	0	0	0	0	0
More than One Race	0	0	0	0	0	0	0	0	0	0
Unknown or Not Reported	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	980	616	0	0	0	0	0	0	0	1596

**Section 3 - Protection and Monitoring Plans (Study 58010)**

## 3.1. Protection of Human Subjects

3.2. Is this a multi-site study that will use the same protocol to conduct non-exempt human subjects research at more than one domestic site?  Yes  No  N/A

If yes, describe the single IRB plan

## 3.3. Data and Safety Monitoring Plan

3.4. Will a Data and Safety Monitoring Board be appointed for this study?  Yes  No

## 3.5. Overall structure of the study team

**Section 4 - Protocol Synopsis (Study 58010)**

## 4.1. Study Design

4.1.a. Detailed Description

4.1.b. Primary Purpose

4.1.c. Interventions

Type	Name	Description
------	------	-------------

4.1.d. Study Phase

Is this an NIH-defined Phase III Clinical Trial?  Yes  No

4.1.e. Intervention Model

4.1.f. Masking  Yes  No

Participant  Care Provider  Investigator  Outcomes Assessor

4.1.g. Allocation

4.2. Outcome Measures

Type	Name	Time Frame	Brief Description
------	------	------------	-------------------

4.3. Statistical Design and Power

4.4. Subject Participation Duration

4.5. Will the study use an FDA-regulated intervention?  Yes  No

4.5.a. If yes, describe the availability of Investigational Product (IP) and Investigational New Drug (IND)/ Investigational Device Exemption (IDE) status

4.6. Is this an applicable clinical trial under FDAAA? (SEE SECTION 6.6)

4.7. Dissemination Plan



## I. OUTCOMES

### I.1 What were the outcomes of the award?

The aims of our grant (R01AI110964) were to: 1) Analyze the risk that there could be a repeat of the SARS outbreak, due to bat coronaviruses still circulating in China; 2) Work out how we can predict which bat viruses would be most likely to emerge, so that we can prevent new outbreaks; 3) Using lab tests, find out if any of the coronaviruses still present in bat populations in China have the potential to infect people. The overall goal of this work is to help design vaccines and therapeutics against future potentially emerging viruses, work out which communities are on the frontline of a new potential outbreak, and reduce the risk of them being infected by analyzing their risk behavior. During this 5-year period of work, we made significant discoveries leading to 18 peer-reviewed scientific papers, including in some of the world's foremost scientific journals.

Overall, our work shows that bats in China harbor a high number and diversity of coronaviruses, some closely related to SARS-CoV (the virus that caused the SARS pandemic in 2003). We sampled over 16,000 individual bats and found evidence of hundreds of different SARS-related coronavirus genetic sequences. We found out that bats across China harbor these viruses, and that they are common, with 6.7% of bats sampled being positive. Many of these bats are found across China, Southeast Asia, South Asia and beyond, suggesting viruses with zoonotic potential may exist in those regions also. Many of these bats are abundant, and roost and feed close to people and livestock, suggesting high potential for future viral spillover. We also identified one cave system in Yunnan Province with horseshoe bats that had diverse SARSr-CoVs, including some with S proteins able to use human ACE2 as entry receptors. Bats in this cave carried SARSr-CoVs with all unique genetic elements of the SARS-CoV outbreak virus, suggesting that this site may be a potential public health risk.

To analyze which viruses were a potential public health risk, we managed to culture three strains of SARSr-CoVs from bat feces: WIV1, WIV16 and Rs4874. We used the genetic codes of some of the other viruses we found in bats and inserted the spike protein genes of those viruses (the proteins that attach to cells) into the cultured viruses. By doing this experiment we showed that other viruses may also be able to infect human cells, and were able to do this safely without the need to culture large amounts of virus. We also showed that some of these viruses cause SARS-like illness in mice that are adapted to have similar cell surface receptors to people. This work proves that there is a clear and present danger for future emergence of novel SARS-like viruses in people. We also demonstrated that outbreaks can happen in livestock. In 2016-17, we analyzed fecal samples from pigs at 5 farms in South China affected by a fatal diarrheal disease. We discovered a new coronavirus, Swine Acute Diarrheal Syndrome coronavirus (SADS-CoV), and showed that it originates in bats, caused the death of more than 20,000 pigs, but also is able to infect human cells in the lab.

Our work has produced predictive algorithms to map hotspots of viral risk so that public health measures can be taken to protect communities at the frontline of potentially the next SARS pandemic. We have produced new reagents and viral cultures that can be used by labs across the world to design novel vaccines and therapeutics against SARS-CoV and other related viruses that might emerge in the future. Finally, our work has been used directly by the WHO to list SARS-related coronaviruses as one of the highest priority group of pathogens with pandemic potential, so that efforts can be taken to stop a future pandemic before it happens.

**From:** [Alison Andre](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Subject:** Re: Call with Peter Daszak re R01 resubmission?  
**Date:** Friday, July 16, 2021 12:02:57 PM

---

Hi Erik,

Thank you, 8:00am would be great - I'll send an invite now.

Enjoy your time off!

Best,  
Alison

On Fri, Jul 16, 2021 at 11:59 AM Stemmy, Erik (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:

Great! I can make 9am on Aug 4<sup>th</sup> work. I can also do earlier if that helps with the Australian time. 8am EST is fine for me for scheduling.

---

**From:** Alison Andre <[REDACTED]> (b) (6)  
**Sent:** Friday, July 16, 2021 11:47 AM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED]> (b) (6)  
**Subject:** Re: Call with Peter Daszak re R01 resubmission?

Hi Erik,

Thanks for getting back to me and for your flexibility. This can wait until August. Is Weds Aug 4 at 9:00am ET open for you?

Many thanks,

Alison

On Fri, Jul 16, 2021 at 11:26 AM Stemmy, Erik (NIH/NIAID) [E] <[REDACTED]> (b) (6) wrote:

Hi Alison,

Happy to chat with Peter and the team. Unfortunately I'm going to be out of the office  
nd

until Aug 2 . Can we schedule a time after that day? If it's urgent I can make some time work in the shorter term, just let me know.

Erik

Erik J. Stemmy, Ph.D.

Program Officer

Respiratory Diseases Branch

Division of Microbiology and Infectious Diseases NIAID/NIH/HHS

Email: [REDACTED] (b) (6)

Pronouns: He/Him/His

Getting ready to publish? Share the good news with your program officer asap! NIAID may be able to help publicize your article. And, remember to list your NIAID grant or contract number in the publication.

\*\*\*\*\*

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---

**From:** Alison Andre [REDACTED] (b) (6)  
**Sent:** Thursday, July 15, 2021 9:13 AM  
**To:** Stemmy, Erik (NIH/NIAID) [E] [REDACTED] (b) (6)  
**Subject:** Call with Peter Daszak re R01 resubmission?

Dear Erik,

I'm writing to hopefully set up a call next week with Peter Daszak, Cadhla Firth, and Hongying Li here at EHA to discuss our planned revision of our recent R01 proposal (1 R01 AI163118-01, Analyzing the potential for future bat coronavirus emergence in Myanmar, Laos, & Vietnam). Would you be available 9:00am ET on Monday July 19, Wednesday July 21, Thursday July 22, or Friday July 23? Apologies for the limited times - we are trying to accommodate an AU time zone as well. If 9:00am isn't feasible, would 4:30pm ET work?

I will follow up with a calendar invite and zoom link.

Many thanks,

Alison

--

**Alison Andre**

*Executive Assistant to the President*

EcoHealth Alliance

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**From:** [Aleksei Chmura](#)  
**To:** [Gratton, Shaun \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Peter Daszak](#); [Hongying Li](#)  
**Subject:** Re: 2R01AI110964-06 Annual Progress Report  
**Date:** Wednesday, June 9, 2021 6:20:17 PM

---

Shaun,

We are not permitted to enter any value less than (b) (4), (b) (6) of effort, so we have done so and included a comment in section D.2.a about this being solely for the purpose of passing eRA Commons validation rules and NO work was performed. The report is submitted in eRA Commons now. Please let me know, if you have any questions or we should provide any additional information.

Cheers,

-Aleksei

**Aleksei Chmura, PhD**  
*Chief of Staff &  
Authorized Organizational Representative*

EcoHealth Alliance  
520 Eighth Avenue, Suite 1200  
New York, NY 10018-4182

(b) (6) (office)  
(b) (6) (mobile)  
[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

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On May 26, 2021, at 10:52, Gratton, Shaun (NIH/NIAID) [E]  
<(b) (6)> wrote:

Hi Aleksei,

Given the situation we think it would be appropriate to enter just Peter in the D.1. table and put (b) (4), (b) (6) effort which I believe is the lowest level that can be entered. Please also add to section D.2.a of the RPPR a statement regarding the effort entered in D.1. Something along the lines of, the grant has been suspended or placed on hold. The effort entered in D.1 was entered to pass eRA Commons submission validation rules.

We think this should allow you all to get past the validations and submit the RPPR.

Let us know if you run in to any issues.

Thanks!

--

Shaun Gratton  
Grants Management Program  
Division of Extramural Activities  
National Institute of Allergy and Infectious Diseases  
National Institutes of Health  
5601 Fishers Lane, Rm. 4G48  
Rockville, Maryland 20852  
Telephone Number: (b) (6)  
Email Address: (b) (6)

Note:

**Effective January 1, 2017**, NIH closeout documentation policy has changed (see [NOT-OD-17-022](#)). NIH is no longer accepting Final Progress Reports (FPR). Grantees must now report final project outcomes using the new F-RPPR. For instruction on how to submit the new F-RPPR please see instructions on the [NIH RPPR Page](#).

---

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---

**From:** Aleksei Chmura (b) (6)  
**Sent:** Friday, May 21, 2021 7:51 PM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)>  
**Cc:** Gratton, Shaun (NIH/NIAID) [E] <(b) (6)> Peter Daszak <(b) (6)> Hongying Li (b) (6)  
**Subject:** Re: 2R01AI110964-06 Annual Progress Report

Thanks, Erik,

We receive an error in Section D. Participants (D.1 What Individuals have worked on the project?) and are unable to submit our RPPR.

How may we fill this out, if due to the suspension there were no person months' work performed?

Cheers,

-Aleksei



**Aleksei Chmura, PhD**  
*Chief of Staff*

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On May 21, 2021, at 16:43, Stemmy, Erik (NIH/NIAID) [E]  
(b) (6) wrote:

Hi Aleksei,  
I've checked in with the grants office. They suggest you submit the RPPR as you normally would, and for the progress and plans sections just indicate that there has been no progress because the award is in suspension. This should keep you in compliance with the annual reporting requirement.

Let me know if you have any other questions.  
Erik

Erik J. Stemmy, Ph.D.  
Program Officer  
Respiratory Diseases Branch  
Division of Microbiology and Infectious Diseases NIAID/NIH/HHS  
Email: (b) (6)  
Pronouns: He/Him/His

Getting ready to publish? Share the good news with your program officer asap! NIAID may be able to help publicize your article. And, remember to list your NIAID grant or contract number in the publication.

\*\*\*\*\*  
\*\*\*\*\*

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---

**From:** Aleksei Chmura <[REDACTED] (b) (6)>  
**Sent:** Wednesday, May 19, 2021 3:36 PM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Cc:** Gratton, Shaun (NIH/NIAID) [E] <[REDACTED] (b) (6)>; Peter Daszak [REDACTED] (b) (6); Hongying Li [REDACTED] (b) (6)  
**Subject:** Re: 2R01AI110964-06 Annual Progress Report

Thanks, Erik!

-Aleksei

**Aleksei Chmura, PhD**  
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On May 19, 2021, at 15:25, Stemmy, Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)> wrote:

Hi Aleksei,

That's an excellent question. Let me look in to it and I'll get back to you.

Erik

Erik J. Stemmy, Ph.D.  
Program Officer  
Respiratory Diseases Branch  
Division of Microbiology and Infectious Diseases  
NIAID/NIH/HHS  
Email: [REDACTED] (b) (6)  
Pronouns: He/Him/His

Getting ready to publish? Share the good news with your program officer asap! NIAID may be able to help publicize your article. And, remember to list your NIAID grant or contract number in the publication.

\*\*\*\*\*  
\*\*\*\*\*

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**From:** Aleksei Chmura <[REDACTED] (b) (6)>  
**Sent:** Wednesday, May 19, 2021 3:24 PM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Cc:** Gratton, Shaun (NIH/NIAID) [E]  
[REDACTED] (b) (6); Peter Daszak  
<[REDACTED] (b) (6)> Hongying Li  
<[REDACTED] (b) (6)>  
**Subject:** 2R01AI110964-06 Annual Progress Report

Dear Erik,

How should we address our annual progress report for our suspended award?

Many thanks!

-Aleksei

**Aleksei Chmura, PhD**  
*Chief of Staff*

EcoHealth Alliance  
520 Eighth Avenue, Suite 1200  
New York, NY 10018-4182

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**From:** [Peter Daszak](#)  
**To:** [Erbelding, Emily \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Aleksai Chmura](#); [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Embry, Alan \(NIH/NIAID\) \[E\]](#); [Post, Diane \(NIH/NIAID\) \[E\]](#)  
**Subject:** RE: Re. Appealing the NIH decision to terminate my R01  
**Date:** Tuesday, May 26, 2020 11:45:51 AM

---

Thanks for understanding Emily – great to hear your response.

(b) (4)

Cheers,  
Peter

**Peter Daszak**

*President*

EcoHealth Alliance

460 West 34<sup>th</sup> Street

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USA

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Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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---

**From:** Erbelding, Emily (NIH/NIAID) [E] <(b) (6)>

**Sent:** Monday, May 25, 2020 8:10 PM

**To:** Peter Daszak (b) (6)

**Cc:** Aleksai Chmura (b) (6); Stemmy, Erik (NIH/NIAID) [E]

<(b) (6)> Embry, Alan (NIH/NIAID) [E] <(b) (6)> Post, Diane (NIH/NIAID) [E] <(b) (6)h.gov>

**Subject:** RE: Re. Appealing the NIH decision to terminate my R01

Dear Peter,

No worries--I would never take offense at that.

We are always interested in hearing about your scientific advances.

Also, I hope that you have seen our rolling R01/R21 announcements, which might afford you an opportunity to continue progress under another grant number.

<https://www.niaid.nih.gov/grants-contracts/covid-19-rolling-foa-pair>

I know that Erik, Diane, and Alan in the Respiratory Disease Branch would be happy to advise you on a potential submission.

Best regards,

Emily

Emily Erbelding, M.D., M.P.H.

Director, Division of Microbiology and Infectious Diseases

NIAID/NIH

5601 Fishers Lane

Rockville, MD 20852

Tel: (b) (6)

---

**From:** Peter Daszak <(b) (6)>

**Sent:** Monday, May 25, 2020 7:57 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] (b) (6) Erbelding, Emily (NIH/NIAID) [E]

< (b) (6) >

**Cc:** Aleksei Chmura (b) (6)

**Subject:** Re. Appealing the NIH decision to terminate my R01

**Importance:** High

Hi Erik and Amy,

I just wanted to email to let you both know that I put in an appeal against the decision to terminate my R01. There is a rule that you have to inform the person who manages the work at NIH, so unfortunately that meant I had to copy you both on the letter and email. I hope you don't take offense – none intended!

Thanks again for all your support on this and other work and I will continue working on a bunch of papers that are still coming out from the R01.

Cheers,

Peter

**Peter Daszak**

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**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Aleksei Chmura](#)  
**Subject:** RE: New Funding Opportunities  
**Date:** Thursday, April 30, 2020 6:31:12 PM

---

Thank you very much Erik. Much appreciated!

Cheers,

Peter

**Peter Daszak**

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Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](#)

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)>

**Sent:** Thursday, April 30, 2020 6:22 PM

**To:** Peter Daszak (b) (6)

**Cc:** Aleksei Chmura (b) (6)

**Subject:** New Funding Opportunities

Hi Peter,

I wanted to point out two new funding opportunities that were released today. Both R21 and R01 mechanisms that include expedited review. Links included below.

- Emergency Awards: Rapid Investigation of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Coronavirus Disease 2019 (COVID-19) (R01 Clinical Trial Not Allowed):  
<https://grants.nih.gov/grants/guide/pa-files/PAR-20-178.html>
- Emergency Awards: Rapid Investigation of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Coronavirus Disease 2019 (COVID-19) (R21 Clinical Trial Not Allowed):  
<https://grants.nih.gov/grants/guide/pa-files/PAR-20-177.html>

Best,

Erik

**From:** Peter Daszak  
**To:** Stemmy, Erik (NIH/NIAID) [E]; Degrace, Marciela (NIH/NIAID) [E]; Leo Poon; Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6) Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; Orenstein, Walter; Lowen, Anice; Baric, Ralph; "Perlman, Stanley"; zhu huachen; Aubree Gordon; Munster, Vincent (NIH/NIAID) [E]; PETERPALESE; "Krammer, Florian"; Ben Cowling; (b) (6) (b) (6) Baric, Toni C; MASATO HATTA; Gabriele Neumann; (b) (6) Subbarao, kanta; Mathur, Punam (NIH/NIAID) [E]; Mark Denison; (b) (6) Johnson, Reed (NIH/NIAID) [E]; Hensley, Lisa (NIH/NIAID) [E]; (b) (6) Stemple, Kimberly (NIH/NIAID) [E]; Sutton, Troy Clavell; (b) (6) Simon, Viviana; Van bakel, Harm; McKenzie, Pamela; Deckhut, Alison (NIH/NIAID) [E]; Donald K. Milton; (b) (6)  
**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID); Pallansch, Mark A. (CDC/DDID/NCIRD/OD); Hall, Aron (CDC/DDID/NCIRD/DVD); Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/NIAID) [C]; Andy Pekosz; Topham, David; Gerber, Susan I. (CDC/DDID/NCIRD/DVD); (b) (6) Bozick, Brooke (NIH/OD) [E]; martin; (b) (6) Schmaljohn, Connie (NIH/NIAID) [E]; Wentworth, David E. (CDC/DDID/NCIRD/ID); Russell, Charles; Cooper, Michael (NIH/NIAID) [E]; Weiss, Susan; (b) (6) Sun, Weina; Roberts, Chris (NIH/NIAID) [E]; Stephen M Tompkins; Uccellini, Melissa; Thomas, Paul; B.H.G. Rockx; Michael Chan; S. Herfst; Lane, Chelsea (NIH/NIAID) [E]; Park, Eun-Chung (NIH/NIAID) [E]; Crozier, Ian (NIH) [C]; Thornburg, Natalie (CDC/DDID/NCIRD/DVD); andrea; (b) (6) Ellebedy, Ali; (b) (6) Read, Sarah (NIH/NIAID) [E]; Finzi, Diana (NIH/NIAID) [E]; Turpin, Jim (NIH/NIAID) [E]; jae jung; (b) (6) SAMANTHA LOEBER; Cherry, Sara; (b) (6) Hui-Ling Yen; Andrew Mesecar; Jonsson, Colleen Beth; Strome, Scott Eric; Fitzpatrick, Elizabeth A  
**Subject:** Termination of our Coronavirus work by NIH last Friday.  
**Date:** Tuesday, April 28, 2020 8:38:51 AM  
**Importance:** High

Dear All,

Just so we don't get waylaid by this – I want to let you all know that NIH (not NIAID) wrote to us last week to abruptly terminate our R01, 'for convenience'.

There is a Politico story about this here:

<https://www.politico.com/news/2020/04/27/trump-cuts-research-bat-human-virus-china-213076>

And we have put out a statement here:

<https://www.ecohealthalliance.org/2020/04/regarding-nih-termination-of-coronavirus-research-funding>

My plan is to continue this work, unfunded for now, and to attend these meetings if you will all have me.

Cheers,

Peter

**Peter Daszak**

*President*

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Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)>

**Sent:** Monday, April 27, 2020 3:49 PM

**To:** Degrace, Marciela (NIH/NIAID) [E] <(b) (6)> Leo Poon <(b) (6)>

Webby, Richard <(b) (6)> malik <(b) (6)> Ghazi Kayali

<(b) (6)> Yoshi Kawaoka <(b) (6)> R.A.M. Fouchier

< (b) (6) (b) (6) Richard Rothman < (b) (6) Pekosz, Andrew S. < (b) (6) Schultz-Cherry, Stacey < (b) (6) Orenstein, Walter < (b) (6) Lowen, Anice < (b) (6) Baric, Ralph < (b) (6) 'Perlman, Stanley' < (b) (6) Peter Daszak < (b) (6); zhu huachen < (b) (6) Aubree Gordon < (b) (6) < (b) (6) PETERPALESE < (b) (6) 'Krammer, Florian' < (b) (6) Ben Cowling < (b) (6) < (b) (6); (b) (6) Baric, Toni C < (b) (6) MASATO HATTA < (b) (6) Gabriele Neumann < (b) (6) < (b) (6) Subbarao, Kanta < (b) (6) Mathur, Punam (NIH/NIAID) [E] < (b) (6) Mark Denison < (b) (6) < (b) (6) Johnson, Reed (NIH/NIAID) [E] < (b) (6) Hensley, Lisa (NIH/NIAID) [E] < (b) (6) < (b) (6) Stemple, Kimberly (NIH/NIAID) [E] < (b) (6) Sutton, Troy Clavell < (b) (6) < (b) (6) Simon, Viviana < (b) (6) Van bakel, Harm < (b) (6) McKenzie, Pamela < (b) (6) Deckhut, Alison (NIH/NIAID) [E] < (b) (6) Donald K. Milton < (b) (6) j < (b) (6) **Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID) < (b) (6) Pallansch, Mark A. (CDC/DDID/NCIRD/OD) < (b) (6) Hall, Aron (CDC/DDID/NCIRD/DVD) < (b) (6) Post, Diane (NIH/NIAID) [E] < (b) (6) Embry, Alan (NIH/NIAID) [E] < (b) (6) Lampley, Rebecca (NIH/NIAID) [C] < (b) (6) Andy Pekosz < (b) (6) Topham, David < (b) (6); Gerber, Susan I. (CDC/DDID/NCIRD/DVD) < (b) (6) < (b) (6) Bozick, Brooke (NIH/OD) [E] < (b) (6) < (b) (6) Schmaljohn, Connie (NIH/NIAID) [E] < (b) (6) Wentworth, David E. (CDC/DDID/NCIRD/ID) < (b) (6) Russell, Charles < (b) (6) Cooper, Michael (NIH/NIAID) [E] < (b) (6) Weiss, Susan < (b) (6) < (b) (6) < (b) (6) Sun, Weina < (b) (6) Roberts, Chris (NIH/NIAID) [E] < (b) (6) Stephen M Tompkins < (b) (6) Uccellini, Melissa < (b) (6) Thomas, Paul < (b) (6) B.H.G. Rockx < (b) (6) Michael Chan < (b) (6) S. Herfst < (b) (6) Lane, Chelsea (NIH/NIAID) [E] < (b) (6) Park, Eun-Chung (NIH/NIAID) [E] < (b) (6) Crozier, Ian (NIH) [C] < (b) (6) Thornburg, Natalie (CDC/DDID/NCIRD/DVD) < (b) (6) < (b) (6) Ellebedy, Ali < (b) (6) < (b) (6) Read, Sarah (NIH/NIAID) [E] < (b) (6) ih.gov>; Finzi, Diana (NIH/NIAID) [E] < (b) (6) Turpin, Jim (NIH/NIAID) [E] < (b) (6) jae jung < (b) (6) < (b) (6) SAMANTHA LOEBER < (b) (6) Cherry, Sara < (b) (6) < (b) (6) Hui-Ling Yen < (b) (6) Andrew Mesecar < (b) (6) Jonsson, Colleen Beth < (b) (6) Strome, Scott Eric < (b) (6) Fitzpatrick, Elizabeth A < (b) (6)

**Subject:** COVID-19 Weekly Investigator Call April 28th  
Hi Everyone,

On this week's call we'll have highlights from Sue Gerber from CDC and Yoshi Kawaoka from the Univ of Wisconsin. Please see below for last week's attendees. As usual, if you just dialed in via phone the system recorded you as Caller X, so please let me and Rebecca Lampley know if your name should be added.

Please also let us know if you would like to present on May 12<sup>th</sup> or 19<sup>th</sup>.

Erik

#### Attendees 4/21

Erik Stemmy  
Marciela DeGrace  
Rebecca Lampley  
Adolfo Garcia-Sastre  
Alan Embry  
Ali Ellebedy  
Andrea Sant  
Andrew Pekosz  
Annice Lowen  
Brooke Bozick  
Charles Russell  
Chris Roberts  
Connie  
David Topham  
David Wentworth  
Diane Post  
Donna Neu  
Eunchung Park  
Florian Krammer  
Gabriele Neumann  
Ghazi Kayali  
Harm van Bakel  
Ian Crozier  
James Kobie  
Jim Chappell  
Juergen Richt  
Kanta Subbarao  
Katy Shaw-Saliba  
Kimberly Stemple  
Larry Anderson  
Lisa Hensley  
Mark Denison  
Mark Sangster  
Marlene Espinoza  
Masato Hatta (UW)  
Matt Frieman  
Maureen McGargill  
Melissa Uccellini

Pamela McKenzie  
Paul Thomas  
Peter Daszak  
Peter Palese  
Punam Mathur  
Ralph Baric  
Reed Johnson  
Richard Rothman  
Ron Fouchier  
Sander Herfst  
Simon Anthony  
Stacey Schultz-Cherry  
Stanley Perlman  
Stephen Tompkins  
Susan Gerber  
Susan Weiss  
Troy Sutton  
Tom Fabrizio  
Vineet Menachery  
Vivanna  
Walt Orenstein  
Weina Sun  
Yoshihiro Kawaoka



**From:** [Peter Daszak](#)  
**To:** [Erbelding, Emily \(NIH/NIAID\) \[E\]](#); [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Cassetti, Cristina \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Aleksiej Chmura](#)  
**Subject:** Politico Story  
**Date:** Monday, April 27, 2020 6:37:40 PM  
**Importance:** High

---

Just to let you know we heard just now that someone at NIH has leaked the email chain and letter to Politico and a story will come out tonight.

We've tried to avoid this, but it looks like it's beyond our control now. We've put out a very brief statement saying we're going to ask NIH for the rationale behind it and I won't be talking to reporters right now.

Hope this goes away, and sorry this happened.

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

460 West 34<sup>th</sup> Street

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Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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**From:** [Aleksei Chmura](#)  
**To:** [Erbelding, Emily \(NIH/NIAID\) \[E\]](#); [Cassetti, Cristina \(NIH/NIAID\) \[E\]](#); [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Peter Daszak](#); [Alison Andre](#)  
**Subject:** Call to Discuss Potential for Geographic Expansion and Advice  
**Date:** Sunday, April 26, 2020 10:22:24 PM

---

Dear Emily, Cristina, and Erik,

Could Peter speak with the three of you sometime tomorrow (Monday 27th April) to discuss potential for geographic expansion and your advice on next steps?

Would anytime between 11am-3pm or after 4pm work? I have included a Doodle Poll link, if that may be useful.

<https://doodle.com/poll/vrcqqpeytwb943ux>

Many thanks!

-Aleksei

**Aleksei Chmura, PhD**

*Chief of Staff*

EcoHealth Alliance  
460 West 34th Street, Suite 1701  
New York, NY 10001

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(mobile)

[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

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**From:** [Alison Andre](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Erbelding, Emily \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Peter Daszak](#)  
**Subject:** Re: Call with Peter Daszak Friday 4/24  
**Date:** Thursday, April 23, 2020 9:32:26 AM

---

Hi both,  
Very sorry – I misread the calendar. Would 1:30pm work? If not, I think we could make 2:30 work.  
Thanks,  
Alison

---

**From:** "Stemmy, Erik (NIH/NIAID) [E]" <(b) (6)>  
**Date:** Thursday, April 23, 2020 at 9:30 AM  
**To:** "Erbelding, Emily (NIH/NIAID) [E]" <(b) (6)> Alison Andre  
<(b) (6)>  
**Cc:** Peter Daszak <(b) (6)>  
**Subject:** RE: Call with Peter Daszak Friday 4/24  
I can make 2:30 tomorrow work as well. Thanks!

---

**From:** Erbelding, Emily (NIH/NIAID) [E] <(b) (6)>  
**Sent:** Thursday, April 23, 2020 9:26 AM  
**To:** Alison Andre <(b) (6)>; Stemmy, Erik (NIH/NIAID) [E]  
<(b) (6)>  
**Cc:** Peter Daszak <(b) (6)>  
**Subject:** RE: Call with Peter Daszak Friday 4/24  
I am free at 2:30 tomorrow

---

**From:** Alison Andre <(b) (6)>  
**Sent:** Thursday, April 23, 2020 8:57 AM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)> Erbelding, Emily (NIH/NIAID) [E]  
<(b) (6)>  
**Cc:** Peter Daszak <(b) (6)>  
**Subject:** Call with Peter Daszak Friday 4/24

Dear Erik and Emily,  
Peter would like to have a brief call with you tomorrow to discuss a FOIA request that we received from NIAID. Peter's free at 11:30am, 12:00pm, and 2:30pm. Would one of these times work? If not, please let me know and I can move some things around. It should take no more than 30 minutes.  
Thank you,  
Alison

**Alison Andre**  
*Executive Assistant to the President*

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460 West 34th Street – 17th floor  
New York, NY 10001

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1.212.380.4465 (fax)  
[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

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**From:** Peter Daszak  
**To:** Stemmy, Erik (NIH/NIAID) [E]; Degrace, Marciela (NIH/NIAID) [E]; Leo Poon; Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6) Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; Orenstein, Walter; Lowen, Anice; Baric, Ralph; "Perلمان, Stanley"; zhu huachen; Aubree Gordon; Munster, Vincent (NIH/NIAID) [E]; PETERPALESE; "Krammer, Florian"; Ben Cowling; (b) (6) (b) (6) Baric, Toni C; MASATO HATTA; Gabriele Neumann (b) (6) Subbarao, kanta; Mathur, Punam (NIH/NIAID) [E]; Mark Denison; (b) (6) Johnson, Reed (NIH/NIAID) [E]; Hensley, Lisa (NIH/NIAID) [E]; (b) (6) Stemple, Kimberly (NIH/NIAID) [E]; Sutton, Troy Clavell; (b) (6) Simon, Viviana; Van bakel, Harm; McKenzie, Pamela; Deckhut, Alison (NIH/NIAID) [E]; (b) (6)  
**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID); Pallansch, Mark A. (CDC/DDID/NCIRD/OD); Hall, Aron (CDC/DDID/NCIRD/DVD); Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/NIAID) [C]; Andy Pekosz; Topham, David; Gerber, Susan I. (CDC/DDID/NCIRD/DVD); (b) (6) Bozick, Brooke (NIH/OD) [E]; martin; (b) (6) Schmaljohn, Connie (NIH/NIAID) [E]; Wentworth, David E. (CDC/DDID/NCIRD/ID); Russell, Charles; Cooper, Michael (NIH/NIAID) [E]; Weiss, Susan; (b) (6) Sun, Weina; Roberts, Chris (NIH/NIAID) [E]; Stephen M Tompkins; Uccellini, Melissa; Thomas, Paul; B.H.G. Rockx; Michael Chan; S. Herfst; Lane, Chelsea (NIH/NIAID) [E]; Park, Eun-Chung (NIH/NIAID) [E]; Crozier, Ian (NIH) [C]; Thornburg, Natalie (CDC/DDID/NCIRD/DVD); (b) (6) Ellebedy, Ali; (b) (6) Read, Sarah (NIH/NIAID) [E]; Finzi, Diana (NIH/NIAID) [E]; Turpin, Jim (NIH/NIAID) [E]; Saif, Linda; Wang, Qiuhong; (b) (6)  
**Subject:** Request from Linda Saif & her group at OSU  
**Date:** Tuesday, April 21, 2020 9:57:17 AM  
**Importance:** High

---

Dear All,

As I mentioned on the call, Linda Saif and her group (cc'd here) sent a request for reagents (below). If any of you can help, please contact her directly at the emails below...

**From:** Saif, Linda <(b) (6) "Wang, Qiuhong" <(b) (6) Anastasia Vlasova (b) (6)>>

**Sent:** Friday, February 28, 2020 10:23 PM

**To:** Peter Daszak (b) (6)

**Subject:** Re: nature news request

**Importance:** High

A major component of my research has been using the pig as a model for human rotavirus vaccines since they are susceptible to disease and infection with human rotaviruses and I have long term NIH support for this research using a pig disease model (also for human noroviruses testing for antivirals!).

Do you know any source for the SARS-CoV-2 reagents I indicated below?

First: hyperimmune sera to SARS-CoV-2 nonstructural and structural proteins, respectively, for IHC and IFA assays.

Also:

1. SARS-CoV-2 S-pseudovirus;
2. Hyperimmune sera to SARS-CoV-2 nonstructural and structural proteins, respectively;
3. Human antiserum to SARS-CoV-2;
4. Human antiserum to SARS-CoV;
5. Human antiserum to MERS-CoV;
6. Human antiserum to HCoV-OC43;
7. Human antiserum to HCoV-HKU1;
8. Human antiserum to HCoV-229E;
9. Human antiserum to HCoV-NL63;

Regards,  
Linda

Linda J. Saif, PhD  
Distinguished University Professor  
Food Animal Health Research Program  
OARDC/The Ohio State University  
1680 Madison Ave  
Wooster, Oh 44691  
Cheers,  
Peter

**Peter Daszak**

*President*  
EcoHealth Alliance  
460 West 34<sup>th</sup> Street  
New York, NY 10001  
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Tel.: (b) (6)

Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)>

**Sent:** Monday, April 20, 2020 3:09 PM

**To:** Degrace, Marciela (NIH/NIAID) [E] <(b) (6)> Leo Poon <(b) (6)>

Webby, Richard <(b) (6)> malik <(b) (6)> Ghazi Kayali

<(b) (6)> Yoshi Kawaoka <(b) (6)> R.A.M. Fouchier

<(b) (6)> (b) (6) Richard Rothman <(b) (6)> Pekosz,

Andrew S. <(b) (6)> Schultz-Cherry, Stacey <(b) (6)>

Orenstein, Walter <(b) (6)> Lowen, Anice <(b) (6)> Baric, Ralph

<(b) (6)> 'Perlman, Stanley' <(b) (6)> Peter Daszak

<(b) (6)> zhu huachen <(b) (6)> Aubree Gordon

<(b) (6)> (b) (6)

<(b) (6)> PETERPALESE <(b) (6)> 'Krammer, Florian'

<(b) (6)> Ben Cowling <(b) (6)> (b) (6)

(b) (6) (b) (6) Baric, Toni C <(b) (6)>

MASATO HATTA <(b) (6)> Gabriele Neumann (b) (6)

<(b) (6)> Subbarao, Kanta <(b) (6)> Mathur,

Punam (NIH/NIAID) [E] <(b) (6)> Mark Denison <(b) (6)>

(b) (6) (b) (6) Johnson, Reed (NIH/NIAID) [E]

<(b) (6)> Hensley, Lisa (NIH/NIAID) [E] <(b) (6)>

(b) (6) Stemple, Kimberly (NIH/NIAID) [E] <(b) (6)> Sutton,

Troy Clavell <(b) (6)> (b) (6) Simon, Viviana

<(b) (6)> Van bakel, Harm <(b) (6)> McKenzie, Pamela

<(b) (6)> Deckhut, Alison (NIH/NIAID) [E] <(b) (6)>

(b) (6)

**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID) <(b) (6)> Pallansch, Mark A. (CDC/DDID/NCIRD/OD)

(b) (6); Hall, Aron (CDC/DDID/NCIRD/DVD) <(b) (6)> Post, Diane (NIH/NIAID)

[E] (b) (6); Embry, Alan (NIH/NIAID) [E] <(b) (6)> Lampley, Rebecca



(NIH/NIAID) [C] < (b) (6) Andy Pekosz (b) (6); Topham, David  
<David\_ (b) (6) Gerber, Susan I. (CDC/DDID/NCIRD/DVD)  
< (b) (6) (b) (6) Bozick, Brooke (NIH/OD) [E] < (b) (6)  
mart (b) (6) Schmaljohn, Connie (NIH/NIAID) [E] < (b) (6)  
Wentworth, David E. (CDC/DDID/NCIRD/ID) < (b) (6) Russell, Charles  
< (b) (6) Cocper, Michael (NIH/NIAID) [E] < (b) (6)  
Weiss, Susan < (b) (6) (b) (6)  
(b) (6) Sun, Weina < (b) (6) Roberts, Chris (NIH/NIAID) [E]  
< (b) (6) Stephen M Tompkins < (b) (6) Uccellini, Melissa  
< (b) (6) Thomas, Paul < (b) (6) B.H.G. Rockx  
< (b) (6) Michael Chan < (b) (6) S. Herfst < (b) (6)  
Lane, Chelsea (NIH/NIAID) [E] < (b) (6) Park, Eun-Chung (NIH/NIAID) [E]  
(b) (6); Crozier, Ian (NIH) [C] < (b) (6) Thornburg, Natalie  
(CDC/DDID/NCIRD/DVD) < (b) (6) (b) (6) Ellebedy, Ali  
(b) (6); (b) (6) Read, Sarah (NIH/NIAID) [E]  
< (b) (6) ih.gov>; Finzi, Diana (NIH/NIAID) [E] < (b) (6) Turpin, Jim (NIH/NIAID)  
[E] < (b) (6)

**Subject:** COVID-19 Weekly Investigator Call April 21

Hello Everyone,

On this week's call we'll have presentations from Matt Frieman from UMD on some of his ongoing drug testing work, and from Stanley Perlman on his model development work. As promised, below is the attendee list from last week. Note that if you had dialed in only via phone you were recorded as "Caller X," so let us know if your name is missing and we can add it to our records.

Please email Marciela and I if you would like to present on May 5<sup>th</sup> or 12<sup>th</sup>.

Thanks!

Erik

Attendees April 14<sup>th</sup>

Erik Stemmy  
Marciela DeGrace  
Rebecca Lampley  
Adolfo Garcia-Sastre  
Alan Embry  
Alison Augustine  
Andrea Sant  
Andrew Pekosz  
Annice Lowen  
Aubree Gordon  
Brooke Bozick  
Charles Russell  
Chelsea Lane  
Chris Roberts  
David Topham  
David Wentworth  
Diane Post  
Donna Neu

Eunchung Park  
Florian Krammer  
Frederic Bushman  
Gabriele Neumann  
Ghazi Kayali  
Harm van Bakel  
Ian Crozier  
Jim Chappell  
Juergen Richt  
Katy Shaw-Saliba  
Kimberly Stemple  
Larry Anderson  
Lisa Hensley  
Mark Denison  
Mark Sangster  
Marlene Espinoza  
Martin Linster  
Masato Hatta (UW)  
Matt Frieman  
Pamela McKenzie  
Paul Thomas  
Peter Daszak  
Peter Palese  
Punam Mathur  
Reed Johnson  
Richard Rothman  
Ron Fouchier  
Sander Herfst  
Stacey Schultz-Cherry  
Stephen Tompkins  
Susan Gerber  
Susan Weiss  
Tom Fabrizio  
Walt Orenstein  
Weina Sun  
Yoshihiro Kawaoka

**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Erbelding, Emily \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Aleksiej Chmura](#)  
**Subject:** Tony Fauci's comment  
**Date:** Saturday, April 18, 2020 9:25:19 PM

---

We're all very delighted to see that Tony Fauci came out publicly with a comment that dispels the lab origin theory for COVID-19:

<https://www.google.com/amp/s/www.businessinsider.com/fauci-throws-cold-water-conspiracy-theory-coronavirus-escaped-chinese-lab-2020-4%3famp>

And here

<https://www.telegraph.co.uk/news/2020/04/18/us-expert-says-coronavirus-not-developed-chinese-lab/>

If you speak to him about this please pass on my personal thanks - it's extremely comforting to know that he's brave enough to stand up for the truth at this time.

Cheers,

Peter

Peter Daszak  
(Sent from my iPhone)

President  
EcoHealth Alliance

460 West 34th Street, New York, NY10001, USA

[www.EcoHealthAlliance.org](http://www.EcoHealthAlliance.org)



**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Subject:** Accepted: Call with NIAID

---

**From:** [Alison Andre](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Peter Daszak](#)  
**Subject:** Re: Time for a call?  
**Date:** Wednesday, April 15, 2020 11:45:08 AM

---

Perfect, thanks.

---

**From:** "Stemmy, Erik (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Date:** Wednesday, April 15, 2020 at 11:44 AM  
**To:** Alison Andre <[REDACTED] (b) (6)>, Peter Daszak <[REDACTED] (b) (6)>  
**Subject:** RE: Time for a call?

Thanks Alison! 3:30 tomorrow is great. I'll send a skype link.  
Erik

---

**From:** Alison Andre <[REDACTED] (b) (6)>  
**Sent:** Wednesday, April 15, 2020 11:25 AM  
**To:** Peter Daszak <[REDACTED] (b) (6)> Stemmy, Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Subject:** Re: Time for a call?

Hi Erik,

Some times that Peter is available for a call with you and your division director are below:

Thurs 4/16: 3:30-4:00

Fri 4/17: 1:00-2:30, 3:30-5:00pm

Best,

Alison

**Alison Andre**

*Executive Assistant to the President*

EcoHealth Alliance  
460 West 34th Street – 17th floor  
New York, NY 10001

[REDACTED] (b) (6) (direct)  
1.212.380.4465 (fax)  
[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

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---

**From:** Peter Daszak <[REDACTED] (b) (6)>  
**Date:** Wednesday, April 15, 2020 at 11:08 AM  
**To:** "Stemmy, Erik (NIH/NIAID) [E]" <[REDACTED] (b) (6)>  
**Cc:** Alison Andre <[REDACTED] (b) (6)>  
**Subject:** RE: Time for a call?

Great – look forward to that. Alison Andre (cc'd) can set up a time that works for us.

Could I get on a phone line with just you and me 10 mins ahead to fill you in on the conspiracy theories currently flying around about the COVID origins. They're totally unfounded of course, but I want to let you know the details so you can respond if anyone asks for clarification to you.

Cheers,

Peter

**Peter Daszak**

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Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)>

**Sent:** Wednesday, April 15, 2020 10:34 AM

**To:** Peter Daszak <[REDACTED] (b) (6)>

**Subject:** Time for a call?

Hi Peter,

Thanks again for speaking yesterday, I thought it was a great discussion. I was filling our division director in on your work since she wasn't able to join and wanted to ask if you would have some time for a call with her to fill in some details? Let me know a couple times that would work and I can help facilitate it. Also, did you say that the work you presented was in press in Nature?

Erik

**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Degrace, Marciela \(NIH/NIAID\) \[E\]](#)  
**Subject:** RE: nCoV weekly investigators meeting  
**Date:** Tuesday, April 14, 2020 2:11:51 AM  
**Importance:** High

---

Hi Erik and Marciela,

Just realized you were probably out of the office yesterday. In case you do want me to present tomorrow am, I have a slide deck that I'll plan to run from my own laptop once I 'share screen', but here's a dropbox link to the powerpoint file in case something goes wrong.

(b) (6)

Cheers,

Peter

**Peter Daszak**

*President*

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Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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---

**From:** Peter Daszak

**Sent:** Saturday, April 11, 2020 1:16 PM

**To:** 'Stemmy, Erik (NIH/NIAID) [E]' <(b) (6)> Degrace, Marciela (NIH/NIAID) [E] <(b) (6)>  
Leo Poon <(b) (6)> Webby, Richard <(b) (6)> malik <(b) (6)> Ghazi Kayali  
<(b) (6)> Yoshi Kawaoka <(b) (6)> R.A.M. Fouchier <(b) (6)>  
<(b) (6)> Richard Rothman <(b) (6)> Pekosz, Andrew S. <(b) (6)> Schultz-Cherry, Stacey  
<(b) (6)> Orenstein, Walter <(b) (6)> Lowen, Anice <(b) (6)>  
Baric, Ralph <(b) (6)> 'Perlman, Stanley' <(b) (6)> zhu huachen <(b) (6)>  
Aubree Gordon <(b) (6)> <(b) (6)>  
PETERPALESE <(b) (6)> 'Krammer, Florian' <(b) (6)> Ben Cowling  
<(b) (6)> <(b) (6)> <(b) (6)> <(b) (6)> Baric, Toni C  
<(b) (6)> MASATO HATTA <(b) (6)> Gabriele Neumann  
<(b) (6)> <(b) (6)> Subbarao, Kanta <(b) (6)>  
Mathur, Punam (NIH/NIAID) [E] <(b) (6)> Mark Denison <(b) (6)>  
MFr <(b) (6)> <(b) (6)> Johnson, Reed (NIH/NIAID) [E] <(b) (6)>  
Hensley, Lisa (NIH/NIAID) [E] <(b) (6)> <(b) (6)> Stemple, Kimberly (NIH/NIAID) [E]  
<(b) (6)> Sutton, Troy Clavell <(b) (6)> <(b) (6)> Simon, Viviana  
<(b) (6)> Van bakel, Harm <(b) (6)> McKenzie, Pamela  
<(b) (6)> <(b) (6)>  
**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID) <(b) (6)> Pallansch, Mark A. (CDC/DDID/NCIRD/OD) <(b) (6)> Hall,  
Aron (CDC/DDID/NCIRD/DVD) <(b) (6)> Post, Diane (NIH/NIAID) [E] <(b) (6)> Embry, Alan  
(NIH/NIAID) [E] <(b) (6)> Lampley, Rebecca (NIH/NIAID) [C] <(b) (6)> Andy Pekosz  
<(b) (6)> Topham, David <(b) (6)> Gerber, Susan I. (CDC/DDID/NCIRD/DVD)  
<(b) (6)> <(b) (6)> Bozick, Brooke (NIH/OD) [E] <(b) (6)> <(b) (6)>  
<(b) (6)>; Wentworth, David E. (CDC/DDID/NCIRD/ID) <(b) (6)> Russell, Charles <(b) (6)>  
Cooper, Michael (NIH/NIAID) [E] <(b) (6)> Weiss, Susan <(b) (6)>  
<(b) (6)> <(b) (6)> Sun, Weina <(b) (6)> Roberts, Chris  
(NIH/NIAID) [E] <(b) (6)> Stephen M Tompkins <(b) (6)> Uccellini, Melissa  
<(b) (6)> Thomas, Paul <(b) (6)> B.H.G. Rockx <(b) (6)> Michael  
Chan <(b) (6)> S. Herfst <(b) (6)> Lane, Chelsea (NIH/NIAID) [E] <(b) (6)>  
Schmaljohn, Connie (NIH/NIAID) [E] <(b) (6)> Eakin, Ann (NIH/NIAID) [E] <(b) (6)> Krafft,  
Amy (NIH/NIAID) [E] <(b) (6)>

**Subject:** RE: nCoV weekly investigators meeting

Hi Erik,

I'd like to schedule to give a presentation to the group on unpublished results from sampling we've done in bats in china. We've got about 700 new RdRp sequences of bat-CoVs (Alpha- & Beta), analyzed phylogeny and looked at where the likely hotspots for evolution of SARS-CoVs are based on this.

Talk should take 10-15 mins and would shed a bit of light on likely geographic origins of SARS-CoV & SARS-CoV-2.

We have a paper going through the mill on this, but would be good to show our group the results first before it goes public.

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

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New York, NY 10001

USA

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Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] (b) (6)

**Sent:** Tuesday, April 7, 2020 9:07 AM

**To:** Degrace, Marciela (NIH/NIAID) [E] (b) (6); Leo Poon (b) (6); Webby, Richard

(b) (6); malik (b) (6); Ghazi Kayali (b) (6); Yoshi Kawaoka

(b) (6); R.A.M. Fouchier (b) (6); Richard Rothman

(b) (6); Pekosz, Andrew S. (b) (6); Schultz-Cherry, Stacey (b) (6)

; Orenstein, Walter <(b) (6)>; Lowen, Anice <(b) (6)>; Baric, Ralph

<(b) (6)>; 'Perlman, Stanley' <(b) (6)>; Peter Daszak <(b) (6)>

zhu huachen (b) (6); Aubree Gordon (b) (6); vincent.munster\_nih.gov

(b) (6); PETERPALESE <(b) (6)>; 'Krammer, Florian'

(b) (6); Ben Cowling (b) (6); (b) (6); (b) (6)

(b) (6); Baric, Toni C (b) (6); MASATO HATTA (b) (6)

Gabriele Neumann (b) (6); Subbarao, Kanta

(b) (6); Mathur, Punam (NIH/NIAID) [E] (b) (6); Mark Denison

(b) (6); (b) (6); (b) (6); Johnson, Reed (NIH/NIAID) [E]

(b) (6); Hensley, Lisa (NIH/NIAID) [E] (b) (6); (b) (6) Stemple,

Kimberly (NIH/NIAID) [E] (b) (6); Sutton, Troy Clavell (b) (6)

(b) (6); Simon, Viviana (b) (6); Van bakel, Harm

<(b) (6)>; McKenzie, Pamela <(b) (6)> (b) (6)

**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID) <(b) (6)>; Pallansch, Mark A. (CDC/DDID/NCIRD/OD) (b) (6); Hall,

Aron (CDC/DDID/NCIRD/DVD) (b) (6); Post, Diane (NIH/NIAID) [E] (b) (6); Embry, Alan

(NIH/NIAID) [E] (b) (6); Lampley, Rebecca (NIH/NIAID) [C] (b) (6); Andy Pekosz

(b) (6); Topham, David (b) (6); Gerber, Susan I. (CDC/DDID/NCIRD/DVD)

(b) (6); (b) (6); Bozick, Brooke (NIH/OD) [E] (b) (6); (b) (6)

; Wentworth, David E. (CDC/DDID/NCIRD/ID) <(b) (6)>; Russell, Charles <(b) (6)>

Cooper, Michael (NIH/NIAID) [E] <(b) (6)>; Weiss, Susan <(b) (6)>

(b) (6); (b) (6); Sun, Weina <(b) (6)>; Roberts, Chris

(NIH/NIAID) [E] (b) (6); Stephen M Tompkins <(b) (6)>; Uccellini, Melissa

(b) (6); Thomas, Paul (b) (6); B.H.G. Rockx (b) (6); Michael

Chan <(b) (6)>; S. Herfst (b) (6); Lane, Chelsea (NIH/NIAID) [E] (b) (6)

Schmaljohn, Connie (NIH/NIAID) [E] <(b) (6)>; Eakin, Ann (NIH/NIAID) [E] <(b) (6)>; Krafft,

Amy (NIH/NIAID) [E] (b) (6)

**Subject:** RE: nCoV weekly investigators meeting

Hi Everyone,

For those not logged in to GoToMeeting, attached is the paper Mark is discussing.

Erik



**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Aleksai Chmura](#); [Embry, Alan \(NIH/NIAID\) \[E\]](#)  
**Subject:** RE: Question over NIAID/NIH designation of coronavirus work as "essential"  
**Date:** Saturday, April 11, 2020 1:25:53 PM

---

Thanks Erik – much appreciated and we will follow the guidelines in the link below.

Cheers,  
Peter

**Peter Daszak**

*President*

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Twitter: [@PeterDaszak](#)

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] (b) (6)  
**Sent:** Monday, April 6, 2020 7:28 AM  
**To:** Peter Daszak (b) (6)  
**Cc:** Aleksai Chmura (b) (6); Embry, Alan (NIH/NIAID) [E]  
(b) (6)

**Subject:** RE: Question over NIAID/NIH designation of coronavirus work as "essential"

Hi Peter,

We are not able to provide letters or intervene in institution's decisions on which work is essential to continue. The only guidance we can offer is the link below which covers NIH policy for continued operations as a standard. It does provide exceptions for COVID-19 related research. Hopefully that helps!

<https://www.nih.gov/news-events/news-releases/nih-shifts-non-mission-critical-laboratory-operations-minimal-maintenance-phase>

Erik

---

**From:** Peter Daszak (b) (6)  
**Sent:** Sunday, April 5, 2020 10:03 PM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)>  
**Cc:** Aleksai Chmura <(b) (6)>  
**Subject:** Question over NIAID/NIH designation of coronavirus work as "essential"  
**Importance:** High

Hi Erik,

On one of our recent weekly meetings that you mentioned that NIH or NIAID was looking into the possibility of research on coronaviruses being listed as "essential" or something similar. This came up because some universities were going into almost total closure and there's obviously a need to keep groups active.

At EcoHealth Alliance, our staff have been 100% remote as of two weeks ago. The building remains open, but given that NY State has issued only essential services should be open, we're concerned that we may end up getting denied access to our offices, servers, financial systems, and basic maintenance operations .

Can you give me some guidance on this? Is there a letter that we can get from you, or others at NIAID or NIH that clarifies what's essential research, and what isn't? We're currently working actively on coronavirus research as you know, but now some of our analysts are working on modeling COVID-19 dynamics and the economics of control and prevention programs for COVID-19. Any help or suggestions would be greatly appreciated.

Cheers,

Peter

**Peter Daszak**

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Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

*EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation.*



**From:** Peter Daszak  
**To:** Stemmy, Erik (NIH/NIAID) [E]  
**Cc:** Degrace, Marciela (NIH/NIAID) [E]; Leo Poon; Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6) Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; Orenstein, Walter; Lowen, Anice; Baric, Ralph; Perlman, Stanley; zhu huachen; Aubree Gordon; Munster, Vincent (NIH/NIAID) [E]; PETERPALESE; Krammer, Florian; Ben Cowling; (b) (6); (b) (6)  
(b) (6) Baric, Toni C; MASATO HATTI; Gabriele Neumann (b) (6)  
Subbarao, Kanta; Mathur, Punam (NIH/NIAID) [E]; Mark Denison; (b) (6)  
(b) (6) Johnson, Reed (NIH/NIAID) [E]; Hensley, Lisa (NIH/NIAID) [E]; (b) (6)  
; Stemple, Kimberly (NIH/NIAID) [E]; Sutton, Troy Clavell; (b) (6)  
Simon, Viviana; Van bakel, Harm; McKenzie, Pamela; (b) (6) Fry, Alicia  
(CDC/DDID/NCIRD/ID); Pallansch, Mark A. (CDC/DDID/NCIRD/OD); Hall, Aron (CDC/DDID/NCIRD/DVD); Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/NIAID) [C]; Andy Pekosz; Topham, David; Gerber, Susan I. (CDC/DDID/NCIRD/DVD); (b) (6); Bozick, Brooke (NIH/OD) [E]; (b) (6) Schmaljohn, Connie (NIH/NIAID) [E]; Wentworth, David E. (CDC/DDID/NCIRD/ID); Russell, Charles; Cooper, Michael (NIH/NIAID) [E]; Weiss, Susan; (b) (6) (b) (6) Sun, Weina; Roberts, Chris (NIH/NIAID) [E]; Stephen M Tompkins; Uccellini, Melissa; Thomas, Paul; William B. Karesh  
**Subject:** RE: COVID-19 Investigator Call March 31  
**Date:** Tuesday, March 31, 2020 9:21:19 AM  
**Attachments:** [Animal summary for Peter.docx](#)

This is a summary from a weekly meeting that the OIE has on animal involvement in COVID-19. Most of it is known to you all, but just in case there are any bits of information that are interesting, please have a look. If you need further details, Dr. William B. Karesh, who's at EcoHealth Alliance, is one of the leadership team at OIE and can give you further information. I've cc'd him here.

Cheers,  
Peter

**Peter Daszak**

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*EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation*

**From:** Peter Daszak (b) (6)  
**Sent:** Tuesday, March 31, 2020 8:21 AM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)>  
**Cc:** Degrace, Marciela (NIH/NIAID) [E] <(b) (6)> Leo Poon <(b) (6)>  
Webby, Richard <(b) (6)> malik <(b) (6)> Ghazi Kayali <(b) (6)>  
<(b) (6)>; Yoshi Kawaoka <(b) (6)> R.A.M. Fouchier <(b) (6)>  
<(b) (6)> (b) (6) Richard Rothman <(b) (6)> Pekosz, Andrew S. <(b) (6)> Schultz-Cherry, Stacey <(b) (6)>  
Orenstein, Walter <(b) (6)> Lowen, Anice <(b) (6)> Baric, Ralph <(b) (6)>  
<(b) (6)> Perlman, Stanley <(b) (6)> zhu huachen <(b) (6)>  
<(b) (6)> Aubree Gordon <(b) (6)> vincent.munster\_nih.gov <(b) (6)>  
<(b) (6)> <(b) (6)> PETERPALESE <(b) (6)>  
Krammer, Florian <(b) (6)> Ben Cowling <(b) (6)>  
la <(b) (6)> <(b) (6)> <(b) (6)> Baric, Toni C

## OIE has weekly expert working group meeting for COVID-19 in animals.

### Transgenic mice

A manuscript by Bao (on BioRxiv : <https://www.biorxiv.org/content/10.1101/2020.02.07.939389v2>) presented data supporting the suitability of the SARS-CoV **transgenic mouse** model for SARS-CoV2. The hACE2 transgenic mice were inoculated intranasally at a dosage of  $10^5$  TCID50 per mouse. Weight loss of up to 5% was observed for 10 dpi only in the infected mice. Other clinical symptoms were not observed. The typical histopathology was interstitial pneumonia with significant inflammatory cells infiltration around the bronchioles and blood vessels, and viral antigens were observed in bronchial epithelial cells and alveolar epithelial cells. **The phenomenon was not found in wild type mice infected with SARS-CoV-2.**

### Golden Syrian Hamsters

Chan (Clin Infect Dis 2020, see [below](#)) established a readily available small animal model for COVID-19 using golden Syrian hamster (*Mesocricetus auratus*). The Syrian hamster could be consistently infected by SARS-CoV-2. Maximal clinical signs of rapid breathing, weight loss, histopathological changes from the initial exudative phase of diffuse alveolar damage with extensive apoptosis to the later proliferative phase of tissue repair, airway and intestinal involvement with virus nucleocapsid protein expression, high lung viral load, and spleen and lymphoid atrophy associated with marked cytokine activation were observed within the first week of virus challenge. The lung virus titre was between  $10^5$ - $10^7$  TCID50/g.

#### **Challenged index hamsters consistently infected naïve contact hamsters housed**

All infected hamsters recovered and developed mean serum neutralising antibody titre  $\geq 1:427$  fourteen days post-challenge. Immunoprophylaxis with early convalescent serum achieved significant decrease in lung viral load but not in lung pathology.

### Ferrets

A communication by CSIRO, the Commonwealth Scientific and Industrial Research Organisation in Australia, on March 9, suggested that ferrets are susceptible to SARS CoV-2, the team claiming that the virus replicates in the animal host (<https://www.csiro.au/en/Research/Health/Infectious-diseases-coronavirus/Latest-updates>).

Other labs also doing Ferret studies

### Cynomolgus macaques

A manuscript by Rockx (on BioRxiv: <https://www.biorxiv.org/content/10.1101/2020.03.17.995639v1>) indicates that SARS-CoV-2 infection in cynomolgus macaques results in COVID-19-like disease with prolonged virus excretion from nose and throat in absence of clinical signs.

### Rhesus macaques



Callaway (Nature 2020, see [below](#)) provided a summary of the current status of research on COVID-19 animal models. He pointed to the preprint by Chao Shan at the Chinese Academy of Sciences Wuhan Institute of Virology, who found that rhesus macaques infected with SARS-CoV-2 had a fairly mild illness. None developed fevers, but X-rays of their lungs showed signs of pneumonia similar to those in humans with COVID-19. This was confirmed after some of the monkeys were euthanized and their lungs dissected. The researchers killed two monkeys three days after infection and another pair after six days. They monitored two further animals for three weeks; these monkeys lost some weight, but didn't seem to have other serious symptoms.

Deng (non-peer-reviewed manuscript on BioRxiv: <https://www.biorxiv.org/content/10.1101/2020.03.13.990036v1.full.pdf>) presented data suggesting that macaques can be infected with SARS-CoV-2 via the conjunctival route. Viral load and distribution in the macaques infected by this route were comparatively high in the nasolacrimal system, while relatively mild and local in the lung compared with those in macaques inoculated via intratracheal routes. This publication refers to the contrasting observation that no SARS-CoV-2 could be detected by RT-PCR in 114 conjunctival swabs samples 28 from patients with COVID-19 pneumonia.

Bao (non-peer-reviewed manuscript on BioRxiv: <https://www.biorxiv.org/content/10.1101/2020.03.13.990226v1.full.pdf>) **studied the possibility of reinfection** in a rhesus macaque model of infection. Following the initial intratracheal infection, none of the animals developed fever, but three of the four monkeys showed weight loss ranging from 200 g to 400 g. Other clinical signs such as reduced appetite, increased respiration rate and hunched posture were transient after the initial challenge. Viral loads in nasal and pharyngeal swabs peaked at 3 days post-infection (dpi) and then declined naturally. Similarly, viral loads from anal swabs reached the peak at 3 dpi and then declined to undetectable level at 14 dpi. Chest X-ray at 7 dpi showed that the upper lobe of the right lung had varying degrees of the localized infiltration and interstitial markings, showing the mild to bilateral ground-glass opacification. Two infected monkeys (M3 and M4) were intratracheally re-challenged at 28 dpi. None of the monkeys showed the weight loss after re-exposure, but a transient elevation of body temperature was observed in both re-exposed monkeys. Viral loads in nasopharyngeal and anal swabs tested negative after the re-exposure of SARS-CoV-2. The neutralizing antibody titer of one of the 2 monkeys increased after re-challenge (Table 9). **The authors concluded that SARS-CoV-2 infection could protect rhesus macaques from subsequent exposure.**

## Experimental Infection studies are now ongoing in:

**Germany:** Pigs, ferrets, Chickens, Rosettus fruit bats

**Canada:** Pigs, Chickens, Turkeys

**US:** plans now for Big Brown Bats

## Natural infections:

**Hong Kong:** 2 of 17 dogs tested the lived in households with infected people have tested positive by PCR and at least one by serology. No clinical signs of illness and both converted to negative PCR tests within 10-14 days. One of these positive dogs in an infected household was living with another dog that has tested negative throughout the same period of isolation and testing.

**Belgium:** One cat living in a household of an infected individual has been reported as having clinical signs – gastrointestinal and respiratory. The owner has not allowed the cat to be sampled but swabs of vomitus and feces have tested positive by PCR. There is some question about contamination of the samples since the animal is living in the household with the infected owner.

**China:** Fur farm animal surveillance China – Bai, et al: 625 tissue samples from farmed mink, foxes, and raccoon dog in 14 regions of China from 2016-2019, all negative on PCR testing. 150 fecal samples from farmed mink, foxes, and raccoon dogs in Jilin Province in December 2019 all negative on PCR testing.

### Concerns and Precautions:

Due to domestic ferret susceptibility, US endangered species recovery programs for **Black-footed Ferrets** are now taking prevention steps. Captive animals are being separated into smaller groups with different care-takers to reduce the risk of entire captive colonies being infected by a single person. All are equipped with protocols for disease reporting and response,

**USF&WS** has now cancelled all spring bat cave survey work and banned permitted researchers from handling wild bats to reduce the risk of introducing the human virus into bat populations in the US until further studies can demonstrate susceptibility or lack thereof.

< (b) (6) MASATO HATTA < (b) (6) Gabriele Neumann  
(b) (6) < (b) (6) Subbarao, Kanta  
< (b) (6) Mathur, Punam (NIH/NIAID) [E]  
< (b) (6) Mark Denison < (b) (6)  
(b) (6) (b) (6) Johnson, Reed (NIH/NIAID) [E]  
< (b) (6) Hensley, Lisa (NIH/NIAID) [E] (b) (6)  
(b) (6) Stemple, Kimberly (NIH/NIAID) [E] < (b) (6) Sutton,  
Troy Clavell < (b) (6) (b) (6) Simon, Viviana  
< (b) (6) Van bakel, Harm < (b) (6) McKenzie, Pamela  
< (b) (6) (b) (6) Fry, Alicia (CDC/DDID/NCIRD/ID)  
(b) (6) Pallansch, Mark A. (CDC/DDID/NCIRD/OD) < (b) (6) Hall, Aron  
(CDC/DDID/NCIRD/DVD) < (b) (6) Post, Diane (NIH/NIAID) [E] (b) (6)  
Embry, Alan (NIH/NIAID) [E] < (b) (6) Lampley, Rebecca (NIH/NIAID) [C]  
< (b) (6) Andy Pekosz < (b) (6) Topham, David  
<David\_ (b) (6) Gerber, Susan I. (CDC/DDID/NCIRD/DVD) < (b) (6)  
(b) (6) Bozick, Brooke (NIH/OD) [E] < (b) (6)  
martin. (b) (6) Schmaljohn, Connie (NIH/NIAID) [E] < (b) (6)  
Wentworth, David E. (CDC/DDID/NCIRD/ID) < (b) (6) Russell, Charles  
< (b) (6) Cooper, Michael (NIH/NIAID) [E] < (b) (6) Weiss,  
Susan < (b) (6) (b) (6) (b) (6)  
(b) (6) Sun, Weina < (b) (6) Roberts, Chris (NIH/NIAID) [E]  
< (b) (6) Stephen M Tompkins < (b) (6) Uccellini, Melissa  
< (b) (6) Thomas, Paul < (b) (6)

**Subject:** Re: COVID-19 Investigator Call March 31

Erik - could my colleague William Karesh give a quick update on animal infection news from the OIE on our call today - 5 mins?

Cheers,

Peter

Peter Daszak

(Sent from my iPhone)

President

EcoHealth Alliance

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On Mar 30, 2020, at 4:20 PM, Stemmy, Erik (NIH/NIAID) [E] (b) (6) wrote:

Hi Everyone,

It's hard to believe it has already been a week since our last call! My apologies for being slow to get this information out to you, but below is the attendee roster from last week. In the interest of time we will not plan to do an official roll call moving forward,



except for asking if there are new attendees who haven't joined before. Note that there were several folks who were identified only as "Caller #," so please let me know (**do not reply to all**) if you're not on the list and I will add you. I have also pasted below a link to NIH's grant FAQ page regarding COVID-19 in case there is information there that is useful for you.

Moving forward we are going to change the format of the meeting a bit and have one or two short (~15 minute) presentations where someone can present a highlight of their COVID-19 work. Hopefully this will stimulate more discussion of specific topics. After those talks we will then run through a few updates on some standing agenda items. As always we would like this to be a useful venue to engage with the group, so please reach out if you have other suggestions for topics or would like to volunteer to give a short update at a future meeting. See below for an agenda for tomorrow's call.  
Erik

### **March 31 Agenda**

Short Highlight 1: Fouchier Group (Sander Herfst, EMC)

Short Highlight 2: Peiris Group (HKU)

Standing items

Animal Models

Reagents

Assays

Open Discussion

NIH Grants COVID-19 FAQ: [https://grants.nih.gov/grants/natural\\_disasters/corona-virus.htm](https://grants.nih.gov/grants/natural_disasters/corona-virus.htm)

### **March 24 Attendee Roster**

Erik Stemmy

Marciela DeGrace

Rebecca Lampley

Adolfo Garcia-Sastre

Andrew Pekosz

Annice Lowen

Aubree Gordon

Ben Cowling

Brooke Bozick

Courtney Comar (Susan Weiss lab)

David Topham

Mark Denison

Diane Post

Florian Krammer

Frederic Bushman

Gabriele Neumann

Ghazi Kayali

Harm van Bakel

Katy Shaw-Saliba

Kimberly Stemple

Larry Anderson

Lisa Hensley

Masato Hatta (UW)

Melissa Uccellini

Pamela McKenzie

Peter Palese

Punam Mathur

Reed Johnson  
Richard Webby  
Chris Roberts  
Alan Embry  
Charles Russell  
Stacey Schultz-Cherry  
Stephen Tompkins  
Paul Thomas  
Tom Fabrizio



**From:** Peter Daszak  
**To:** Degrace, Marciela (NIH/NIAID) [E]; Mark Denison; (b) (6) Johnson, Reed (NIH/NIAID) [E]; Munster, Vincent (NIH/NIAID) [E]; Leo Poon; Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6) (b) (6) Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; "david (b) (6) Orenstein, Walter; Lowen, Anice; Baric, Ralph; "Periman, Stanley"; zhu huachen; Aubree Gordon; PETERPALESE; "Krammer, Florian"; Ben Cowling; (b) (6) (b) (6) Baric, Toni C; MASATO HATTA; Gabriele Neumann (b) (6) Subbarao, Kanta; Mathur, Punam (NIH/NIAID) [E]; (b) (6) (b) (6) Hensley, Lisa (NIH/NIAID) [E]; gavin.smith@duke-nus.edu.sg  
**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID); Pallansch, Mark A. (CDC/DDID/NCIRD/DVD); Hall, Aron (CDC/DDID/NCIRD/DVD); Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/NIAID) [C]; Stemmy, Erik (NIH/NIAID) [E]; Andy Pekosz; Topham, David; Gerber, Susan I. (CDC/DDID/NCIRD/DVD); (b) (6); Bozick, Brooke (NIH/OD) [E]; martin.linster@duke-nus.edu.sg  
**Subject:** NASEM Standing Committee on EIDs and 21st Century Health Threats  
**Date:** Tuesday, March 17, 2020 10:11:03 AM  
**Attachments:** [Standing Committee on EIDs and 21st C Health Threats. Details.pdf](#)  
[SC on EID and 21st Century Threats - One Pager.pdf](#)

Alan, Erik

Here are some details on the NASEM "Standing Committee on Emerging Infectious Diseases and 21<sup>st</sup> Century Health Threats" – the charge to the committee, and the agenda and membership details from the first call last week. There is a draft doc on research agenda being finalized and sent to OSTP Director also.

This Committee was set up at the request of the OSTP Director, who joined the first call as well as NSC staff, and I'm sure they'll be involved heavily in future calls/reports.

I hope NIH/NIAID can be involved and so you're aware, all of the above info is public domain, and there was a session open to the public for the first meeting.

Cheers,

Peter

**Peter Daszak**

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*EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation*

**From:** Degrace, Marciela (NIH/NIAID) [E] <(b) (6)>

**Sent:** Thursday, February 20, 2020 8:18 AM

**To:** Mark Denison <(b) (6)> (b) (6) Johnson, Reed (NIH/NIAID) [E] <(b) (6) vincent.munster\_nih.gov (b) (6)>

<(b) (6) Leo Poon <(b) (6) Webby, Richard

<(b) (6) malik <(b) (6) Ghazi Kayali <(b) (6)

Yoshi Kawaoka <(b) (6) R.A.M. Fouchier <(b) (6)

(b) (6) (b) (6) Richard Rothman <(b) (6) Pekosz,

Andrew S. <(b) (6) Schultz-Cherry, Stacey <(b) (6)

(b) (6) Orenstein, Walter <(b) (6) Lowen, Anice

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**STANDING COMMITTEE ON  
EMERGING INFECTIOUS DISEASES  
AND 21<sup>ST</sup> CENTURY HEALTH  
THREATS**

**Health and Medicine Division**

**Board on Health Sciences Policy  
Board on Global Health**

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**Briefing Materials  
Meeting 1  
March 11, 2020**

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Virtual Meeting

*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE

**TAB 1**

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**Agenda and Remote Participation Information**

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## First Meeting of the Standing Committee on Emerging Infectious Diseases and 21<sup>st</sup> Century Health Threats

### Final Agenda

Wednesday, March 11, 2020, 12:00 p.m. – 5:30 p.m. ET  
Virtual Zoom Meeting/Keck 201 for Local Participants

#### Background:

In response to a request from the Office of Science and Technology Policy (OSTP) and the Office of the Assistant Secretary for Preparedness and Response (ASPR), the National Academies of Sciences, Engineering, and Medicine will convene a standing committee of experts to help inform the federal government on critical science and policy issues related to emerging infectious diseases and other 21st century health threats. The standing committee will include members with expertise in emerging infectious diseases, public health, public health preparedness and response, biological sciences, clinical care and crisis standards of care, risk communication, epidemiology, and regulatory issues, as well as veterinary science, One Health, ethics, and community engagement. The standing committee will provide a venue for the exchange of ideas among federal government agencies, the private sector, and the academic community, as well as other relevant stakeholders.

#### Meeting Objectives

- Discuss the statement of task (SOT) and role of the standing committee
- Conduct the bias and conflict of interest discussion
- Discuss relevant context and key issues
- Explore potential research priorities arising as a result of the emergence of COVID-19 in the U.S. and globally
- Discuss next steps to move forward on key issues; plan second meeting and identify speakers and topics

Wednesday, March 11, 2020

#### CLOSED SESSION (COMMITTEE MEMBERS ONLY)

12:00 p.m.

#### Welcome and Introductions

- Brief introductions
- Discussion of meeting objectives



**Harvey Fineberg**, *Committee Chair*  
President  
Gordon and Betty Moore Foundation

**Andrew Pope**  
Director, Board on Health Sciences Policy  
Health and Medicine Division

**Julie Pavlin**  
Director, Board on Global Health  
Health and Medicine Division

**12:10 p.m.      Role of National Academies Standing Committees**

**Andrew Pope**  
Director, Board on Health Sciences Policy  
Health and Medicine Division

**12:15 p.m.      Discussion of Bias and Conflict of Interest**

**Lauren Shern**  
Associate Executive Director  
Health and Medicine Division

**12:30 p.m.      Committee Discussion with Sponsor to Inform Open Session**

**Kelvin Droegemeier**  
Director  
White House Office of Science and Technology Policy

**Harvey Fineberg**, *Committee Chair*  
President  
Gordon and Betty Moore Foundation

**OPEN SESSION**

**SESSION I      Welcoming Remarks, Introductions, and Sponsors' Charge to the Committee**

**1:30 p.m.      Welcome and Introductions**

**Harvey Fineberg**, *Committee Chair*  
President  
Gordon and Betty Moore Foundation

**Marcia McNutt**  
President  
National Academy of Sciences

**Victor Dzau**  
President  
National Academy of Medicine

**Gregory Symmes**  
Chief Program Officer  
The National Academies of Sciences, Engineering, and Medicine

**1:45 p.m. Sponsors' Charge to the Committee**

- Discuss the context/purpose for the standing committee
- Review the statement of task

**Kelvin Droegemeier**  
Director  
White House Office of Science and Technology Policy

**David (Chris) Hassell**  
Senior Science Advisor  
Assistant Secretary for Preparedness and Response  
U.S. Department of Health and Human Services

**2:00 p.m. Committee Discussion with the Sponsor**

**Harvey Fineberg**, *Committee Chair*  
President  
Gordon and Betty Moore Foundation

**2:30 p.m. BREAK**

**SESSION II Diagnostics and Viral Characterization**

**2:45 p.m. Presentation of the Issues**

**Ian Watson**  
Assistant Director for Biotechnology & Biosecurity  
Office of Science & Technology Policy

**Paige Waterman**  
Assistant Director for Biological Threat Defense  
Office of Science & Technology Policy

**David (Chris) Hassell**  
Senior Science Advisor  
Assistant Secretary for Preparedness and Response  
U.S. Department of Health and Human Services

**3:00 p.m.            Committee Discussion of the Issues**

**Harvey Fineberg, *Committee Chair***  
President  
Gordon and Betty Moore Foundation

**SESSION III            Other Selected Topics and Issues**

**4:00 p.m.            Discussion of Committee’s Selected Topics and Issues**

**Harvey Fineberg, *Committee Chair***  
President  
Gordon and Betty Moore Foundation

**CLOSED SESSION (COMMITTEE ONLY)**

**5:00 p.m.            Committee Debrief, Next Steps, and Potential Future Meeting Topics**

**Harvey Fineberg, *Committee Chair***  
President  
Gordon and Betty Moore Foundation

**5:30 p.m.            *ADJOURN MEETING***



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**TAB 2**

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**Standing Committee Membership Information**

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Health and Medicine Division

**Standing Committee on Emerging Infectious Diseases and 21<sup>st</sup> Century Health Threats**

**INTERNAL COMMITTEE ROSTER**

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**Mary Bassett, M.D., M.P.H.**

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of the Practice and Human Rights  
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**Peter Daszak, Ph.D.**

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Health and Medicine Division

**Standing Committee on Emerging Infectious Diseases and 21<sup>st</sup> Century Health Threats**

COMMITTEE MEMBER BIOSKETCHES

**Harvey Fineberg, M.D., Ph.D. (Chair)**

President

Gordon and Betty Moore Foundation

Harvey Fineberg is president of the Gordon and Betty Moore Foundation. He previously served as president of the Institute of Medicine from 2002 to 2014 and as provost of Harvard University from 1997 to 2001, following 13 years as dean of the Harvard School of Public Health. Fineberg devoted most of his academic career to the fields of health policy and medical decision-making. His past research has focused on the process of policy development and implementation, assessment of medical technology, evaluation and use of vaccines, and dissemination of medical innovations. Fineberg serves on the boards of the Carnegie Endowment for International Peace and the China Medical Board. He helped found and served as president of the Society for Medical Decision Making, previously served on and chaired the board of the William and Flora Hewlett Foundation, and chaired the committee to review the performance of the World Health Organization and the functioning of the International Health Regulations (2005) during the 2009 H1N1 influenza pandemic. Fineberg is co-author of the books *Clinical Decision Analysis*, *Innovators in Physician Education* and *The Epidemic That Never Was*, an analysis of the controversial federal immunization program against swine flu in 1976. He has co-edited several books on such diverse topics as AIDS prevention, vaccine safety, understanding risk in society and global health. He has also authored numerous articles published in professional journals. Fineberg chaired the National Academies committee that produced the 2019 report on *Reproducibility and Replicability in Science*. He earned his bachelor's and doctoral degrees at Harvard and is the recipient of several honorary degrees.

**Kristian Andersen, Ph.D.**

Associate Professor and Director of Infectious Disease Genomics, Scripps Research Translational  
Institute

The Scripps Research Institute

Kristian Andersen is an associate professor in the Department of Immunology and Microbiology at Scripps Research, with joint appointments in the Department of Integrative Structural and Computational Biology, and at the Scripps Research Translational Institute. Over the past decade, his research has focused on the complex relationship between host and pathogen. Using a combination of next-generation sequencing, field work, experimentation, and computational biology he has spearheaded large international collaborations investigating the emergence, spread and evolution of deadly pathogens, including SARS-CoV-2, Zika virus, Ebola virus, West Nile virus, and Lassa virus. His work is highly cross-disciplinary and exceptionally collaborative. Kristian earned his doctoral degree from the University of Cambridge and performed postdoctoral work in Pardis Sabeti's group at Harvard University and the Broad Institute.



**Mary Bassett, M.D., M.P.H.**

Director of the François-Xavier Bagnoud Center for Health and Human Rights  
Harvard School of Public Health

Mary Bassett is the Director of the FXB Center for Health and Human Rights at Harvard University, as well as the FXB Professor of the Practice of Health and Human Rights at the Harvard School of Public Health. With more than 30 years of experience in public health, Dr. Mary Travis Bassett has dedicated her career to advancing health equity. Prior to her directorship at the FXB Center, Dr. Bassett served for four years as commissioner of Health for New York City. As commissioner, she worked to ensure that every New York City neighborhood supported the health of its residents, with the goal of closing gaps in population health across the city. Originally from New York City, Dr. Bassett lived in Zimbabwe for nearly 20 years. Previously, she was the Program Director for the African Health Initiative and the Child Well-being Program at the Doris Duke Charitable Foundation. She received her B.A. in History and Science from Harvard University and her M.D. from Columbia University's College of Physicians and Surgeons. She served her medical residency at Harlem Hospital Center, and has a master's degree in Public Health from the University of Washington, where she was a Robert Wood Johnson Clinical Scholar.

**Trevor Bedford, Ph.D.**

Associate Faculty Member, Vaccine and Infectious Disease Division, Public Health Sciences Division,  
and Human Biology Division  
Fred Hutchinson Cancer Research Center

Trevor Bedford is currently Associate Member of the Vaccine and Infectious Disease Division, the Public Health Sciences Division, and the Human Biology Division at the Fred Hutchinson Cancer Research Center. Dr. Bedford uses powerful computers and complex statistical methods to study the rapid spread and evolution of viruses. Data gathered from these processes help researchers develop successful strategies for monitoring and controlling infectious diseases. His visual representations of viral family trees are used to show how the fate of dangerous outbreaks is often determined by the genetics of the infectious agent, human behavior and geography. Dr. Bedford has applied these techniques to document the worldwide spread of seasonal flu viruses. He is developing models to predict which strains of influenza are likely to be most challenging to humans — data that help inform the crucial early decisions about which strains to include in annual flu shots. He specializes in tracking the evolutionary changes of viruses such as HIV and influenza that use RNA, rather than DNA, to carry their genetic information. RNA viruses are much more prone to rapid mutation, which makes many of them particularly nimble at escaping the human immune system and difficult to stop with vaccines. He is a leading advocate for the immediate release of research analyzing viral evolution during epidemics, fresh information that could make a lifesaving difference. He received his Ph.D. in biology from Harvard University.

**Georges Benjamin, M.D.**

Executive Director  
American Public Health Association

Georges Benjamin is well-known as a health leader, practitioner, and administrator. Dr. Benjamin has served as the executive director of the American Public Health Association, the nation's oldest and largest organization of public health professionals, since December 2002. He is a former secretary of Health for the state of Maryland. Dr. Benjamin is a graduate of the Illinois Institute of Technology and the University Of Illinois College Of Medicine. He is board-certified in internal medicine, a Master of the American College of Physicians, a fellow of the National Academy of Public Administration and a fellow emeritus of the American College of Emergency Physicians. He serves on several nonprofit boards such as Research!America, the University of Maryland Medical System and, the Reagan-Udall Foundation. He is a member of the National Academy of Medicine. In April 2016, President Obama appointed Benjamin

to the National Infrastructure Advisory Council, a council that advises the president on how best to assure the security of the nation's critical infrastructure.

**Richard Besser, M.D.**

President and CEO

Robert Wood Johnson Foundation

Richard Besser is president and CEO of the Robert Wood Johnson Foundation (RWJF), a position he assumed in April 2017. Dr. Besser is the former acting director for the Centers for Disease Control and Prevention (CDC), and ABC News' former chief health and medical editor. At RWJF, Dr. Besser leads the largest private foundation in the country devoted solely to improving the nation's health. RWJF's work is focused on building a comprehensive Culture of Health that provides everyone in America with a fair and just opportunity to live the healthiest life possible. In Dr. Besser's role at ABC News, he provided medical analysis and reports for all ABC News programs and platforms. His weekly health chats on social media reached millions. Before joining ABC News in 2009, Dr. Besser worked as director of the Coordinating Office for Terrorism Preparedness and Emergency Response at the CDC. In that role, he was responsible for all the CDC's public health emergency preparedness and emergency response activities. He also served as acting director of the CDC from January to June 2009, during which time he led the CDC's response to the H1N1 influenza pandemic. He is a member of the National Academy of Medicine. He received the Surgeon General's Medallion for his leadership during the H1N1 response, and in 2011 he accepted the Dean's Medal for his contributions to public health from the Johns Hopkins Bloomberg School of Public Health. Dr. Besser received his Bachelor of Arts degree in economics from Williams College and medical degree from the University of Pennsylvania. He completed a residency and chief residency in pediatrics at Johns Hopkins University Hospital in Baltimore.

**Peter Daszak, Ph.D.**

President and CEO

EcoHealth Alliance

Peter Daszak is President of EcoHealth Alliance, a US-based organization that conducts research and outreach programs on global health, conservation, and international development. Dr. Daszak's research has been instrumental in identifying and predicting the origins and impact of emerging diseases across the globe. He is one of the founders of the field of Conservation Medicine and has been instrumental in the growth of EcoHealth, One Health, and now Planetary Health. Dr. Daszak is a member of the National Academy of Medicine and Chair of the NASEM's Forum on Microbial Threats. He is a member of the NRC Advisory Committee to the US Global Change Research Program, the Supervisory Board of the One Health Platform, the One Health Commission Council of Advisors, the CEEZAD External Advisory Board, the Cosmos Club, and the Advisory Council of the Bridge Collaborative. He has served on the IOM Committee on global surveillance for emerging zoonoses, the NRC committee on the future of veterinary research, the International Standing Advisory Board of the Australian Biosecurity CRC; and has advised the Director for Medical Preparedness Policy on the White House National Security Staff on global health issues. Dr. Daszak is a regular advisor to WHO on pathogen prioritization for R&D. He received his Ph.D. in parasitic infectious disease from the University of East London.

**Ellen Embrey**

Managing Partner

Stratitia, Inc.

Ellen Embrey is Managing Partner of Stratitia, Inc., a consulting firm focused on developing meaningful and innovative strategies, and delivering supporting tools and partnerships to bring them successfully to life. Ms. Embrey brings deep expertise in health and medical issues, as well as a wealth of other experience gained during her extensive federal service. In her last federal role, she performed the duties of



the Assistant Secretary of Defense for Health Affairs and the Director, TRICARE Management Activity during the presidential transition period in 2009-2010. From 2002 to 2009, Ms. Embrey was the Deputy Assistant Secretary of Defense for Force Health Protection and Readiness, leading significant changes in Department of Defense policies and programs affecting deployment and combat casualty medicine, health promotion and preventive medicine, medical readiness and public health emergency preparedness and response. For 9 months in 2001, Ms. Embrey performed the duties of Assistant Secretary of Defense for Reserve Affairs, shaping policies affecting the readiness and use of the National Guard and Reserve in both federal and state status. From 2000 to 2001, she served as Chief of Staff of that office, and from 1998 to 2001, as Deputy Assistant Secretary of Defense for Military Assistance to Civil Authorities, developing policies that shaped the role of the National Guard and Reserve components in supporting homeland security, disaster preparedness, and national disaster response capabilities, including advising the president on such matters in the days and weeks following September 11, 2001. Between 1978 and 1997, Ms. Embrey served in senior-level policy analyst, budget analyst, program analyst, management analyst, and systems analyst positions in the Office of the Assistant Secretary of Defense for Reserve Affairs, the Defense Contract Audit Agency, and the Office of Personnel Management. Ms. Embrey was recognized with the Secretary of Defense's Distinguished Civilian Service Award in 2001 and 2004, and twice received the Meritorious Executive Presidential Rank Award in 2006 and 2009.

**Diane Griffin, M.D., Ph.D.**

Professor, Department of Molecular Microbiology and Immunology  
Johns Hopkins Bloomberg School of Public Health

Diane Griffin is University Distinguished Service Professor and Alfred and Jill Sommer Chair of the W. Harry Feinstone Department of Molecular Microbiology and Immunology at Johns Hopkins Bloomberg School of Public Health. Dr. Griffin is a virologist recognized for her work on the pathogenesis of viral infections. She is known particularly for her studies on measles and alphavirus encephalomyelitis that have delineated the role of the immune response in virus clearance, vaccine-induced protection from infection, tissue damage and immune suppression. Dr. Griffin was born in Iowa City, Iowa, and grew up in Oklahoma City. She graduated from Augustana College, Rock Island, Illinois with a degree in biology and from Stanford University School of Medicine in 1968 with a Ph.D. in immunology and M.D., followed by a residency in internal medicine. She was a postdoctoral fellow in virology and infectious diseases at Johns Hopkins University School of Medicine and joined the faculty in 1974. She has been president of the American Society for Virology and of the American Society for Microbiology and is a member of both the National Academy of Sciences and the National Academy of Medicine.

**Margaret Hamburg, M.D.**

Foreign Secretary  
National Academy of Medicine

Margaret Hamburg is an internationally recognized leader in public health and medicine, and currently serves as foreign secretary of the National Academy of Medicine and chair of the NTI | bio Advisory Group. She is a former Commissioner of the U.S. Food and Drug Administration (FDA), having served for almost six years. As FDA Commissioner she was known for advancing regulatory science, streamlining and modernizing FDA's regulatory pathways, and globalization of the agency. Before joining FDA, Hamburg was founding vice president and senior scientist at the Nuclear Threat Initiative. Previous government positions include Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services, Health Commissioner for New York City, and Assistant Director of the National Institute of Allergy and Infectious Diseases, National Institutes of Health. She is President-elect of the American Association for the Advancement of Science (AAAS), as well as an elected member of the Council on Foreign Relations and the National Academy of Medicine. Hamburg currently sits on the boards of the Commonwealth Fund, the Simons Foundation, the Urban Institute, the Global Alliance for Vaccines and Immunization, the Parker Institute for Cancer Immunotherapy and the American Museum

of Natural History. She is chair of the Joint Coordinating Group for the Coalition for Epidemic Preparedness and Innovation, and a member of the Harvard University Global Advisory Council, the Global Health Scientific Advisory Committee for the Gates Foundation, the Harvard Medical School Board of Fellows, and the World Dementia Council. Dr. Hamburg earned her B.A. from Harvard College, her M.D. from Harvard Medical School and completed her medical residency at Weill Cornell Medical Center. She is the recipient of multiple honorary degrees and numerous awards.

**John Hick, M.D.**

Associate Medical Director for EMS  
Medical Director of Emergency Medicine  
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John L. Hick is a faculty emergency physician at Hennepin Healthcare and a Professor of Emergency Medicine at the University of Minnesota. Dr. Hick serves as the deputy medical director for Hennepin County Emergency Medical Services and Medical Director for Emergency Preparedness at HCMC. He is also the Vice-Chair of the Clinical Council for Life Link III helicopter service and medical director for MN TF-1 state US&R team. He served the Minnesota Department of Health as the medical director for the Office of Emergency Preparedness until becoming an Advisor to the Director of OEM at ASPR/HHS where he is the lead editor for the TRACIE healthcare disaster preparedness website. He is the founder and past chair of the Minneapolis/St. Paul Metropolitan Hospital Compact, a 32-hospital mutual aid and planning group active since 2002. He is a national speaker on hospital preparedness issues and has published numerous papers dealing with hospital preparedness for contaminated casualties, personal protective equipment, crisis standards of care, and surge capacity and was honored to serve the Institute of Medicine on their Crisis Standards of Care projects as well as the Forum on Medical and Public Health Preparedness for Disasters and Emergencies. Dr. Hick holds an M.D. from the Mayo Medical School.

**Kent E. Kester, M.D.**

Vice President and Head, Translational Science and Biomarkers  
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Kent Kester is currently Vice President and Head, Translational Science and Biomarkers at Sanofi Pasteur. In this capacity, Dr. Kester leads a team of over 200 research and clinical professionals in the US and France focused on the translational development of new vaccines. During a 24-year career in the US Army, he worked extensively in clinical vaccine development and led multiple research platforms at the Walter Reed Army Institute of Research, the U.S. Department of Defense's largest and most diverse biomedical research laboratory with a major emphasis on emerging infectious diseases, an institution he later led as its Commander/Director. His final military assignment was as the Associate Dean for Clinical Research in the School of Medicine at the Uniformed Services University of the Health Sciences (USUHS). During his military service, Dr. Kester was appointed as the lead policy advisor to the US Army Surgeon General in both Infectious Diseases and in Medical Research & Development. In these capacities, he worked extensively in the interagency environment and developed a variety of Army and DoD medical policies related to infectious diseases, both clinical and research aspects. Dr. Kester holds an undergraduate degree from Bucknell University and an M.D. from Jefferson Medical College, completing his internship and residency in internal medicine at the University of Maryland and a research fellowship in infectious diseases at the Walter Reed Army Medical Center. Currently a member of the US Government Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria (PACCARB) and the Department of Veterans Affairs Health Services Research & Development Service Merit Review Board, he previously chaired the Steering Committee of the NIAID/USUHS Infectious Disease Clinical Research Program, and has served as a member of the FDA Vaccines & Related Biologics Products Advisory Committee (VRBPAC), the NIAID Advisory Council, and the CDC Office of Infectious Diseases Board of Scientific Counselors. He is the Vice Chair of the National Academy of Medicine Forum on Microbial Threats. Board-certified in both internal medicine and infectious diseases, Dr. Kester

holds faculty appointments at USUHS and the University of Maryland; and is a fellow of the American College of Physicians, the Royal College of Physicians of Edinburgh, the Infectious Disease Society of America, and the American Society of Tropical Medicine and Hygiene. He is a member of the clinical faculty at the University of Maryland Shock Trauma Center in Baltimore.

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Patricia King is Professor of Law emeritus at Georgetown University Law Center and an Adjunct Professor in the Department of Health Policy and Management, School of Hygiene and Public Health at Johns Hopkins University. She is the co-author of *Cases and Materials on Law, Science and Medicine*. She is a member of the National Academy of Medicine, a member of the American Law Institute, a fellow of the Hastings Center and a faculty affiliate of Georgetown's Kennedy Institute of Ethics. Her scholarship focuses on race and genomics, racial disparities in health and reproductive health. Professor King has served on numerous national advisory bodies formed to address the ethical issues generated by developments in science and technology, including the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1974-78), which produced the seminal "Belmont Report," the President's Advisory Committee on Human Radiation Experiments (1994-95), the National Institutes of Health's Embryo Research Panel (co-chair for policy, 1994), the Ethics, Legal and Social Issues Working Group of the NIH's Human Genome Project (1989-95), and the NIH's Recombinant DNA Advisory Committee (1979-81). She has served on numerous boards and Institute of Medicine committees and is currently a member of the Board of Health Sciences Policy of the National Academies. She is also a Director of Mathematica an employee-owned company. She is a graduate of Wheaton College (Massachusetts) and has served as a Trustee and Chair of the Wheaton College Board of Trustees. In 2018 she was designated a Life Trustee by the Wheaton College Board. She graduated from Harvard Law School and is a past member of the Harvard Corporation the governing board of Harvard University. She has received honorary degrees from Wheaton College, Old Dominion University, and Harvard University.

**Jonna Mazet, D.V.M., M.P.V.M., Ph.D.**

Executive Director, One Health Institute  
UC Davis School of Veterinary Medicine

Jonna Mazet is a Professor of Epidemiology and Disease Ecology and Executive Director of the One Health Institute in the UC Davis School of Veterinary Medicine, where she focuses on global health problem solving, especially for emerging infectious disease and conservation challenges. Dr. Mazet is active in international One Health research programs, most notably in relation to disease transmission among wildlife, domestic animals, and people and the ecological drivers of disease emergence. Currently, she is the Global Director of a \$175 million viral emergence early warning project, named PREDICT, that has been developed with the US Agency for International Development's (USAID) Emerging Pandemic Threats Program. She was elected to the National Academy of Medicine in 2013 in recognition of her successful and innovative approach to emerging environmental and global health threats and serves on the National Academies' Forum on Microbial Threats, as well as chairs the Academies' One Health Work Group. Jonna joined the UC Global Health Institute Board of Directors as co-vice chair in April 2019. She holds a D.V.M., M.P.V.M., and Ph.D. from UC Davis.



**Phyllis Meadows, Ph.D., M.S.N., R.N.**

Senior Fellow, Health  
The Kresge Foundation

Phyllis Meadows currently serves as the Senior Fellow and Program Advisor for the Kresge Foundation Health Team. In this role, she is responsible for supporting the health team in the development and implementation of investment opportunities within and across the Foundation's various programming areas. Her professional career includes leadership roles in philanthropy, academia, community health and governmental public health. She has previously served in the role of Associate Dean for Public Health Practice and Clinical Professor - Health, Management and Policy with the University of Michigan School of Public Health. She has led several initiatives to expand multi-disciplinary practice in communities, designing the University's first certification program on population health and health equity for medical residents. She is currently a Distinguished Towsley Policy Maker in Residence with the University of Michigan's Gerald Ford School of Public Policy. She has taught and developed graduate level and professional continuing education courses to address emerging health issues, including topics on health policy and public health leadership. Dr. Meadows has extensive experience in public health practice having served in various leadership roles in public health. She has held several official appointments in public health leadership at the state, county and local levels. In her most recent appointment, she served as the Chief Health Officer and Director of Health for the City of Detroit, providing leadership for the department of health, environmental health, infectious diseases, child health, clinical and dental services for the residents of Detroit. Her philanthropic experience includes positions as Program Director for the W.K. Kellogg Foundation - Youth, Education and Higher Education; and advisor for several national initiatives of the Robert Wood Johnson Foundation including the Nurse Executive Leadership Program, Partners in Nursing, and the County Roadmaps project. As a registered nurse, she has worked in both community-based health and hospitals. She currently serves as a Board Member and Advisor for several state level organizations and private foundations focusing on health.

**Tara O'Toole, M.D., M.P.H.**

Executive Vice President  
In-Q-Tel

Tara O'Toole currently serves as Executive Vice President at In-Q-Tel. Dr. O'Toole was confirmed as the Under Secretary for Science and Technology (S&T) at the U.S. Department of Homeland Security (DHS) and served from November 4, 2009 to September 23, 2013. From 2003 to November 2009, Dr. O'Toole was the CEO and Director of the Center for Biosecurity at the University of Pittsburgh Medical Center (UPMC), and Professor of Medicine and of Public Health at the University of Pittsburgh. The Center for Biosecurity of UPMC is an independent organization dedicated to improving the country's resilience to major biological threats. Dr. O'Toole is internationally known for her work on biosecurity and on health and safety issues related to the U.S. nuclear weapons complex. Her publications in the biodefense field include articles on the response to anthrax, smallpox, and plague biological attacks; containment of contagious disease epidemics; biodefense research and development strategies; and hospital preparedness. She is the founding editor of the journal *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*. She was a principal author and producer of *Dark Winter*, an influential exercise conducted in June 2001 to alert national leaders to the dangers of bioterrorist attacks. She was also a principal writer and producer of *Atlantic Storm*, an international ministerial-level biosecurity exercise held in January 2005. Prior to founding the UPMC in 2003, Dr. O'Toole was one of the original members of the Johns Hopkins Center for Civilian Biodefense Strategies and served as its director from 2001 to 2003. She has served on numerous government and expert advisory committees dealing with biodefense, including panels of the Defense Science Board; the National Academy of Engineering Committee on Combating Terrorism; and the National Academy of Sciences Working Group on Biological Weapons. She served as chair of the Board of the Federation of American Scientists from 2006 to 2007, and in 2006 she was appointed to the board of Google Foundation's International Networked System for Total Early Disease

Detection. From 1993 to 1997, Dr. O’Toole served as Assistant Secretary of Energy for Environment Safety and Health. In this position, she was the principal advisor to the Secretary of Energy on environmental protection and on the health and safety of the approximately 100,000 workers in the U.S. nuclear weapons complex and Department of Energy (DOE) laboratories. She developed the first overall management and safety plan for dealing with the highly enriched uranium, plutonium, spent fuel, and radioactive waste left in place when nuclear weapons production was stopped in the early 1990s. She ran the multi-agency, multimillion-dollar task force that oversaw the government’s investigations into human radiation experiments conducted during the Cold War and led the U.S. delegation to Russia to establish the U.S./Russia cooperative effort to study radiation exposure and environmental hazards of the Russian nuclear weapons complex. Prior to her work at DOE, Dr. O’Toole was a senior analyst at the Congressional Office of Technology Assessment, where she directed several projects and studies, including the health impact of pollution resulting from nuclear weapons production. She also served as a consultant to industry and government in matters related to occupational and environmental health; worker participation in workplace safety protection; and organizational change. Dr. O’Toole practiced general internal medicine in community health centers in Baltimore from 1984 to 1988. She is board certified in internal medicine and occupational and environmental health. She has a bachelor’s degree from Vassar College, an M.D. from the George Washington University, and a Master of Public Health degree from Johns Hopkins University. She completed internal medicine residency training at Yale University and a fellowship in Occupational and Environmental Medicine at Johns Hopkins University.

**Alexandra Phelan, S.J.D., LL.M., LL.B.**

Faculty Research Instructor  
Center for Global Health Science and Security  
Georgetown University

Alexandra Phelan is a member of the Center for Global Health Science and Security and a Faculty Research Instructor in the Department of Microbiology and Immunology at Georgetown University. Dr. Phelan also holds an appointment as Adjunct Professor of Law at Georgetown University Law Center. Dr. Phelan works on legal and policy issues related to infectious diseases, with a particular focus on emerging and reemerging infectious disease outbreaks and international law. She has worked as a consultant for the World Health Organization, the World Bank, and Gavi: the vaccine alliance, and has advised on matters including international law and pathogen sharing, human rights law and Zika, intellectual property law, and contract law. She previously worked for a number of years as a solicitor at a firm in Melbourne, Australia and was admitted to practice to the Supreme Court of Victoria and High Court of Australia in 2010. Dr. Phelan’s doctorate examined how overlap between fields of international law – in particular, global health law, international human rights law, and international environmental law – can serve as the catalyst to progressively develop international law to prevent and respond to infectious diseases. She also holds a Master of Laws, specializing in international law, from the Australian National University and a Bachelor of Biomedical Science/Bachelor of Laws (Honours) double degree from Monash University. She also holds a Diploma of Languages (Mandarin Chinese). Dr. Phelan is a General Sir John Monash Scholar and was recognized as an Associate Fellow of the Royal Commonwealth Society in 2015 for her human rights advocacy during the 2013-16 Ebola outbreak.

**David Relman, M.D.**

Thomas C. and Joan M. Merigan Professor in Medicine, and Chief of Infectious Diseases  
Stanford University; VA Palo Alto Health Care System

David Relman is the Thomas C. and Joan M. Merigan Professor in Medicine, and Microbiology and Immunology at Stanford University, and Chief of Infectious Diseases at the Veterans Affairs Palo Alto Health Care System. Dr. Relman is also Senior Fellow at the Freeman Spogli Institute for International Studies (FSI), and served as Science Co-Director at the Center for International Security and Cooperation (2013-2017), at Stanford. He is currently director of a new Biosecurity Initiative at FSI. Relman trained at

MIT and then Harvard Medical School, followed by clinical training in internal medicine and infectious diseases at the Massachusetts General Hospital in Boston, and then a postdoctoral fellowship in microbiology at Stanford. His early research focused on molecular methods for pathogen discovery and over the past 20 years, on the human microbiome. He was elected to the National Academy of Medicine in 2011. Dr. Relman served as vice-chair of the National Research Council Committee that reviewed the science performed for the FBI 2001 Anthrax Letters investigation, chair of the Forum on Microbial Threats (2007-2017), and is currently a member of the Intelligence Community Studies Board (2016-) as well as Chair of a Standing Committee tasked with examining the health-related problems of US embassy personnel stationed overseas, all at the U.S. National Academies of Science. He was a founding member of the National Science Advisory Board on Biosecurity (2005-2014), a member of the Working Group on Biodefense for the President's Council of Advisors on Science and Technology (The White House) (2016), and served as President of the Infectious Diseases Society of America (2012-2013). He holds an M.D. from Harvard Medical School.

**Mark Smolinski, M.D., M.P.H.**

President  
Ending Pandemics

Mark Smolinski currently serves as President of Ending Pandemics. Dr. Smolinski brings 25 years of experience in applying innovative solutions to improve disease prevention, response, and control across the globe. Mark is leading a well-knit team—bringing together technologists; human, animal, and environmental health experts; and key community stakeholders to co-create tools for early detection, advanced warning, and prevention of pandemic threats. Since 2009, Mark has served as the Chief Medical Officer and Director of Global Health at the Skoll Global Threats Fund (SGTF), where he developed the Ending Pandemics in Our Lifetime Initiative in 2012. His work at SGTF created a solid foundation for the work of Ending Pandemics, which branched out as an independent entity on January 1, 2018. Prior to SGTF, Mark developed the Predict and Prevent Initiative at Google.org, as part of the starting team at Google's philanthropic arm. Working with a team of engineers, Google Flu Trends (a project that had tremendous impact on the use of big data for disease surveillance) was created in partnership with the U.S. Centers for Disease Control. Mark has served as Vice President for Biological Programs at the Nuclear Threat Initiative, a public charity directed by CNN founder Ted Turner and former U.S. Senator Sam Nunn. Before NTI, he led an 18-member expert committee of the National Academy of Medicine on the 2003 landmark report "Microbial Threats to Health: Emergence, Detection, and Response." Mark served as the sixth Luther Terry Fellow in Washington, D.C., in the Office of the U.S. Surgeon General and as an Epidemic Intelligence Officer with the U.S. Centers for Disease Control and Prevention. Mark received his B.S. in Biology and M.D. from the University of Michigan in Ann Arbor. He is board-certified in preventive medicine and public health and holds an M.P.H. from the University of Arizona.

**David Walt, Ph.D.**

Hansjörg Wyss Professor of Biologically Inspired Engineering  
Harvard Medical School

David Walt is a member of the faculty at Harvard Medical School in the Department of Pathology, and a Howard Hughes Medical Institute Professor. Dr. Walt pioneered the use of microwell arrays for single-molecule detection and analysis, which has revolutionized the process of genetic and proteomic sequencing, enabling the cost of DNA sequencing and genotyping to plummet nearly a millionfold in the last decade. His current research employs optical fiber microarrays for the detection and analysis of single enzyme molecules to provide mechanistic insight into enzyme mechanisms. In another project, he is also investigating the limits of creating high-density sensing arrays containing thousands of microsensors and nanosensors, and are preparing arrays to perform high-density nucleic acid and protein analysis. Dr. Walt is the Scientific Founder of Illumina, Inc. and Quanterix Corp, and has co-founded several other life sciences startups. Previously, he was a University Professor, Professor of Neuroscience, and Professor of

Oral Medicine at Tufts University. He is a member of the National Academy of Engineering, the National Academy of Medicine, a Fellow of the American Academy of Arts and Sciences, a Fellow of the American Institute for Medical and Biological Engineering, and a Fellow of the National Academy of Inventors. He has received numerous awards and honors, including the 2017 American Chemical Society Kathryn C. Hach Award for Entrepreneurial Success, the 2016 Ralph Adams Award in Bioanalytical Chemistry, the 2014 American Chemical Society Gustavus John Esselen Award, the 2013 Analytical Chemistry Spectrochemical Analysis Award, the 2013 Pittsburgh Analytical Chemistry Award, and the 2010 ACS National Award for Creative Invention. He received a B.S. in chemistry from the University of Michigan and a Ph.D. in chemical biology from SUNY at Stony Brook, and did postdoctoral studies at MIT.



*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE

**TAB 3**

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**Statement of Task**

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*The National Academies of*  
**SCIENCES • ENGINEERING • MEDICINE**

Health and Medicine Division

**Standing Committee on Emerging Infectious Diseases and 21<sup>st</sup> Century Health Threats**

In response to a request from the Office of Science and Technology Policy (OSTP) and the Office of the Assistant Secretary for Preparedness and Response (ASPR), the National Academies of Sciences, Engineering, and Medicine will convene a standing committee of experts to help inform the federal government on critical science and policy issues related to emerging infectious diseases and other 21st century health threats. The standing committee will include members with expertise in emerging infectious diseases, public health, public health preparedness and response, biological sciences, clinical care and crisis standards of care, risk communication, epidemiology, and regulatory issues, as well as veterinary science, One Health, ethics, and community engagement. The standing committee will provide a venue for the exchange of ideas among federal government agencies, the private sector, and the academic community, as well as other relevant stakeholders.

The standing committee will:

- Stand ready to respond on short notice to requests from the federal government to assess and consider the science and policy implications of an emerging infectious disease or significant public health threat;
- Provide a venue to enable science and policy discussions relevant to the federal government on emerging issues, research, and activities through in-depth knowledge of the sponsor's programs, goals, and objectives;
- Identify opportunities to integrate science into national preparedness and response decision making;
- Explore lessons learned and best practices from previous preparedness and response efforts, and identify opportunities to disseminate that information to a variety of stakeholders;
- Serve as a focal point for national policy discussions by experts and other leaders in the field;
- Consider, identify, and discuss strategies for addressing misinformation; and

- Respond to the federal government's needs for continuing dialog related to strategic planning and program development to address emerging infectious diseases, biosecurity, and public health and medical preparedness.

At the request of the sponsors, the standing committee will be involved in the planning, development, and oversight of related ad hoc activities undertaken by separately appointed committees operating under its auspices.

The standing committee will serve as a focal point for the discussion of scientific, technical, and policy issues relevant to emerging infectious diseases and public health preparedness and response that warrant detailed examination. Topics for discussion with the standing committee may include:

- Technical assistance and/or assessment of response to emerging infectious diseases;
- Availability of and access to information, samples, and other materials to determine the origin and evolution of emerging infectious diseases;
- International coordination and engagement;
- Technical assessment of ecological and evolutionary drivers of disease emergence;
- Approaches to proactive public messaging and strategies to address misinformation;
- Other science and policy issues relevant to emerging infectious diseases and 21st century health threats.

The committee will carry out its charge at its in-person and virtual meetings by gathering evidence from experts, deliberating, and, when necessary, by preparing short reports.

**COMMITTEE SPONSORS**

White House Office of Science and Technology Policy and HHS Office of Assistant Secretary for Preparedness and Response

## PROVISIONAL COMMITTEE ROSTER

### **Harvey Fineberg, M.D., Ph.D. (Chair)**

President  
Gordon and Betty Moore Foundation

### **Kristian Andersen, Ph.D.**

Associate Professor and Director of Infectious  
Disease Genomics, Scripps Research Translational  
Institute  
The Scripps Research Institute

### **Mary Bassett, M.D., M.P.H.**

Director of the François-Xavier Bagnoud Center for  
Health and Human Rights  
Harvard School of Public Health

### **Trevor Bedford, Ph.D.**

Associate Faculty Member, Vaccine and Infectious  
Disease Division, Public Health Sciences Division,  
and Human Biology Division  
Fred Hutchinson Cancer Research Center

### **Georges Benjamin, M.D.**

Executive Director  
American Public Health Association

### **Richard Besser, M.D.**

President and CEO  
Robert Wood Johnson Foundation

### **Peter Daszak, Ph.D.**

President and CEO  
EcoHealth Alliance

### **Ellen Embrey**

Managing Partner  
Stratitia, Inc.

### **Diane Griffin, M.D., Ph.D.**

Professor, Department of Molecular Microbiology  
and Immunology  
Johns Hopkins Bloomberg School of Public Health

### **Margaret Hamburg, M.D.**

Foreign Secretary  
National Academy of Medicine

### **John Hick, M.D.**

Associate Medical Director for EMS  
Medical Director of Emergency Medicine  
Hennepin County Medical Center

### **Kent E. Kester, M.D.**

Vice President and Head, Translational Science and  
Biomarkers  
Sanofi Pasteur

### **Patricia King, J.D.**

Professor Emerita  
Georgetown University Law Center

### **Jonna Mazet, D.V.M., M.P.V.M., Ph.D.**

Executive Director, One Health Institute  
UC Davis School of Veterinary Medicine

### **Phyllis Meadows, Ph.D., M.S.N., R.N.**

Senior Fellow, Health  
The Kresge Foundation

### **Tara O'Toole, M.D., M.P.H.**

Executive Vice President  
In-Q-Tel

### **Alexandra Phelan, S.J.D., LL.M., LL.B.**

Faculty Research Instructor  
Center for Global Health Science and Security  
Georgetown University

### **David Relman, M.D.**

Thomas C. and Joan M. Merigan Professor of  
Medicine, and of Microbiology & Immunology;  
Chief of Infectious Diseases  
Stanford University; VA Palo Alto Health Care System

### **Mark Smolinski, M.D., M.P.H.**

President  
Ending Pandemics

### **David Walt, Ph.D.**

Hansjörg Wyss Professor of Biologically Inspired  
Engineering  
Harvard Medical School

## CONTACT INFORMATION

### **Andrew Pope**

Director, Board on Health Sciences Policy

(b) (6) (office)

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## ADDITIONAL INFORMATION

For additional information, please visit  
<http://nationalacademies.org/hmd/Activities/PublicHealth/EmergingInfectiousDiseasesand21stCenturyHealthThreats.aspx>

*The National Academies of*  
**SCIENCES • ENGINEERING • MEDICINE**

Health and Medicine Division

**Standing Committees: What They Do**

Standing committees provide sponsors with an ongoing mechanism to engage the National Academies of Sciences, Engineering, and Medicine, stakeholders, and committee members on specific issues in a variety of ways. They are designed to serve sponsors by helping them address their needs on a continuing basis for short and long-term strategic planning and program development.

Standing committees:

- 1) Stand ready to respond on short notice to requests and other needs from the sponsor(s);
- 2) Provide high-level strategic guidance to sponsor(s) on emerging issues, research, and activities through in-depth knowledge of the sponsor’s programs, goals, and activities;
- 3) Serve as a focal point for national policy discussions by experts and other leaders in the field; and
- 4) Respond to sponsor(s) needs for continuing advice through planning, strategic thinking, and program development.

As part of the ongoing nature of the activity, the standing committee becomes very familiar with the sponsor(s) program/agency. This understanding and familiarity with the sponsor(s) programs facilitates the standing committee’s ability to respond quickly and effectively with in-depth knowledge and insight about the sponsor(s) program.

Standing committee activities may include:

- Meeting periodically with the sponsor(s) and others in information-gathering sessions;
- Inviting experts/guests to provide input on the issues that will serve to inform the sponsor and the standing committee in its strategic planning and program development roles; and
- Conducting public outreach, such as through the development of websites and newsletters from the Academies that provides general information about the standing committee’s activities or other related initiatives of the Academies.

Standing committee outputs may include:

<b>Type</b>	<b>Product</b>	<b>Source/Origin</b>	<b>Recipient</b>	<b>Process</b>
<u>1</u>	Immediate, <b><u>informal verbal feedback and guidance</u></b> provided to sponsors at public meetings	Individual Committee Members during meetings	Sponsors	Public meeting discussions

<u>2</u>	<b>Meeting “Recap,”</b> which is a high-level summary of issues discussed at a committee meeting	Staff prepares the recap/summary	Sponsors (and Committee Members)	Internal review by HMD staff
<u>3</u>	<b>Letter Report,</b> which is a formal report from the committee, based primarily on information presented and discussed at a committee meeting, that may include findings, conclusions, and recommendations on a specific topic	Committee (with Staff support)	Sponsors and the Public	Formal institutional review process
<u>4</u>	<b>Consensus Report,</b> which is a separate Academies report (or workshop) prepared by an ad hoc committee appointed specifically for the identified task	The Standing Committee can identify the need for, and recommend to the Academies that they conduct a study	Sponsors and the Public	Standing committees may also develop ‘spin off’ ideas for workshops and studies that are conducted via separate ad hoc committees (standing committee members may serve on the committees for these ad hoc workshops and studies along with additional members recruited to address the specific workshop or study charge).





EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY  
WASHINGTON, D.C. 20502

February 3, 2020

Dr. Marcia McNutt  
President, National Academy of Sciences  
2101 Constitution Ave, N.W.  
Washington, D.C., U.S. 20418

SUBJECT: Rapid Response Assessment of 2019-nCoV Data Needs

In support of the Office of Science and Technology's (OSTP) National Science and Technology Committee (NSTC) rapid research response work for the 2019-nCoV response, and the Administration's efforts to characterize and provide evidence-based assessments for outbreak response efforts, I am writing to ask the National Academies of Sciences, Engineering, and Medicine (NASEM) to rapidly examine information and identify data requirements that would help determine the origins of 2019-nCoV, specifically from an evolutionary/structural biology standpoint. I also ask NASEM to consider whether this should include more temporally and geographically diverse clinical isolates, sequences, etc.

Although a widely-disputed paper, "Uncanny similarity of unique inserts in the 2019-nCoV spike protein to HIV-1 gp120 and Hag," posted on the pre-print server bioRxiv last week has been withdrawn, the response to that manuscript highlights the need to determine information and data requirements as quickly as possible to better perform and validate such analyses of origin. These questions are important not only for this current situation, but to inform future outbreak preparation and better understand animal/human and environmental transmission aspects of coronaviruses. As part of a broader deliberative process, this review will aid preparedness for future events by establishing a process that quickly assembles subject matter experts for evaluating other potentially threatening organisms.

OSTP requests NASEM convene a meeting of experts, particularly world class geneticists, coronavirus experts, and evolutionary biologists, to assess what data, information, and samples are needed to address the unknowns, in order to understand the evolutionary origins of 2019-nCoV and more effectively respond to both the outbreak and any resulting misinformation. I request a letter statement from the National Academies be prepared and provided in response to this solicitation. A more in-depth examination of the issues will be established as a follow up as needed.

Sincerely,

(b) (6)

Kelvin K. Droegemeier  
Director

*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE

February 6, 2020

Kelvin Droegemeier  
Director  
White House Office of Science and Technology Policy  
1650 Pennsylvania Avenue, NW  
Washington, D.C. 20504

Dear Dr. Droegemeier:

Thank you for your letter regarding the current outbreak of a new respiratory virus, the 2019 Novel Coronavirus, or 2019-nCoV, which was first detected in Wuhan, China, and has now been reported in a growing number of locations worldwide, including the United States.<sup>1</sup> The request from OSTP is timely given the declaration of a public health emergency and potential for misinformation to confound the response.

In response to your request, we consulted leading experts<sup>2</sup> in the fields of virology, infectious disease genomics, genome sciences, epidemiology, microbiology, immunobiology, coronaviruses, emerging infections, biosecurity, and global health. We wanted their views about the data needs that could help elucidate the origin and evolution of 2019-nCoV.

Research studies to better understand the origin of 2019-nCoV and how it relates to viruses found in bats and other species are already underway.<sup>3</sup> The closest known relative of 2019-nCoV appears to be a coronavirus identified from bat-derived samples collected in China.<sup>4</sup> The experts informed us that additional genomic sequence data from geographically- and temporally-diverse viral samples are needed to determine the origin and evolution of the virus. Samples collected as early as possible in the outbreak in Wuhan and samples from wildlife would be particularly valuable. Understanding the driving forces behind viral evolution would help facilitate the development of more effective strategies for managing the 2019-nCoV outbreak and for preventing future outbreaks. In this regard, we understand from Chunli Bai, President, Chinese Academy of Sciences, and the Alliance of International Science Organizations (ANSO), that the Wuhan National Biosafety Laboratory of the Chinese Academy of Sciences is willing to share isolates of the 2019-nCoV with the international community and is working with the University of Texas Medical Branch and other international research institutions on the specifics for the sharing and distribution of the isolates. International collaboration of this kind is more important than ever to overcome these types of global challenges.

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<sup>1</sup> “2019 Novel Coronavirus (2019-nCoV) Situation Summary.” *Centers for Disease Control and Prevention*, 3 Feb. 2020. [https://www.cdc.gov/coronavirus/2019-nCoV/summary.html#anchor\\_1580079137454](https://www.cdc.gov/coronavirus/2019-nCoV/summary.html#anchor_1580079137454). Accessed 3 Feb. 2020.

<sup>2</sup> Experts consulted: Kristian G. Andersen (Scripps Research Institute), Ralph Baric (UNC School of Public Health), Trevor Bedford (Fred Hutchinson Cancer Institute), Aravinda Chakravarti (New York University School of Medicine), Peter Daszak (EcoHealth Alliance), Gigi K. Gronvall (Johns Hopkins Bloomberg School of Public Health), Tom Inglesby (Johns Hopkins Center for Health Security), and Stanley Perlman (University of Iowa).

<sup>3</sup> Latinne *et al.* “Origin and cross-species transmission of bat coronaviruses in China.” *Nature Communications*, in review.

<sup>4</sup> Zhou *et al.* “A pneumonia outbreak associated with a new coronavirus of probable bat origin.” *Nature*, 2020. <https://doi.org/10.1038/s41586-020-2012-7> (2020).



The National Academies stand ready to assemble a committee of experts to examine these issues in more detail and provide evidence-based advice to you in an expedited manner if requested. We appreciate your trust in the National Academies and our efforts to advise the nation and inform public policy decisions.

Sincerely,

(b) (6) (b) (6) (b) (6)

Marcia McNutt, President  
National Academy of Sciences

John L. Anderson., President  
National Academy of Engineering

Victor J. Dzau, President  
National Academy of Medicine

cc: Secretary Alex M. Azar, Department of Health and Human Services

EXECUTIVE OFFICE OF THE PRESIDENT

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

WASHINGTON, D.C. 20502

February 26, 2020

Dr. Marcia McNutt  
President, National Academy of Sciences  
2101 Constitution Ave, N.W.  
Washington, D.C., U.S. 20418

SUBJECT: National Academies Standing Committee for Emerging Infectious Disease and 21<sup>st</sup> Century Health Threats

Dear Dr. McNutt, *Marcia*

Given the complexities of assessing and responding to emerging infectious diseases and other 21<sup>st</sup> Century health threats, as demonstrated by the present situation with COVID-19, a need exists to establish an ongoing activity to facilitate rapid access to expert, independent perspectives and insights. A neutral venue is needed through which the U.S. Government can engage subject matter experts from the private sector, non-governmental organizations, the academic community, and other relevant stakeholders involved in topics of emerging infectious disease, biosecurity, and public health and medical preparedness. The purpose is to provide a means for examining critical issues in depth and providing strategic input and guidance, based on the best available information and expertise.

To address this need, and stemming from the offer you extended in your letter to me dated February 6, 2020, the Office of Science and Technology Policy (OSTP) and the Department of Health and Human Services (HHS) have been working with Dr. Andy Pope, and his colleagues from your organization, on a request for the National Academies of Sciences, Engineering, and Medicine (NAEM) to establish a Standing Committee on Emerging Infectious Diseases and 21<sup>st</sup> Century Health Threats. This committee would:

- Stand ready to respond on short notice to requests from the Federal government to assess and consider the science and policy implications of an emerging infectious disease or other significant public health threat;
- Provide a venue to enable science and policy discussions relevant to the Federal government on emerging issues, research, and activities through in-depth knowledge of the sponsor's programs, goals, and objectives;
- Identify opportunities to integrate science into national preparedness and response decision making;
- Explore lessons learned and best practices from previous preparedness and response efforts, and identify opportunities to disseminate that information to a variety of stakeholders;
- Serve as a focal point for national policy discussions with experts and other leaders in the field;
- Consider, identify and discuss strategies for addressing misinformation; and

EXECUTIVE OFFICE OF THE PRESIDENT

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

WASHINGTON, D.C. 20502

- Respond to the Federal government's needs for continuing dialog related to strategic planning and program development to address emerging infectious diseases, biosecurity, and public health and medical preparedness.

I would request that the standing committee serve as a focal point for the discussion of scientific, technical, and policy issues relevant to emerging infectious diseases and public health preparedness and response that warrant detailed examination.

The committee members should include experts in emerging infectious diseases, epidemiology, disease modeling and forecasting, genomics, public health, public health preparedness and response, clinical care and crisis standards of care, risk communication, and regulatory issues. The committee would provide a venue for the exchange of ideas among Federal government agencies, the private sector, and the academic community, as well as other relevant stakeholders such as non-profit/philanthropic organizations.

Topics for discussion with the Committee may include:

- Technical assistance and/or assessment of response to emerging infectious diseases;
- Availability of and access to information, samples, and other materials to determine the origin and evolution of emerging infectious diseases;
- International coordination and engagement;
- Technical assessment of ecological and evolutionary drivers of disease emergence
- Approaches to proactive public messaging and strategies to address misinformation;
- Other science and policy issues relevant to emerging infectious diseases and 21st century health threats.

Thank you for your partnership and willingness to bring scientific expertise to bear on this important issue.

Sincerely,

(b) (6)

Kelvin K. Droegemeier  
Director

*Thank you, Maria!*

*- Keli*



*The National Academies of*  
**SCIENCES • ENGINEERING • MEDICINE**

Health and Medicine Division

**Standing Committee on Emerging Infectious Diseases and 21<sup>st</sup> Century Health Threats**

In response to a request from the Office of Science and Technology Policy (OSTP) and the Office of the Assistant Secretary for Preparedness and Response (ASPR), the National Academies of Sciences, Engineering, and Medicine will convene a standing committee of experts to help inform the federal government on critical science and policy issues related to emerging infectious diseases and other 21st century health threats. The standing committee will include approximately 15 members with expertise in emerging infectious diseases, public health, public health preparedness and response, biological sciences, clinical care and crisis standards of care, risk communication, epidemiology, and regulatory issues, as well as veterinary science, One Health, ethics, and community engagement. The standing committee will provide a venue for the exchange of ideas among federal government agencies, the private sector, and the academic community, as well as other relevant stakeholders.

The standing committee will:

- Stand ready to respond on short notice to requests from the federal government to assess and consider the science and policy implications of an emerging infectious disease or significant public health threat;
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- Other science and policy issues relevant to emerging infectious diseases and 21st century health threats.

The committee will carry out its charge at its in-person and virtual meetings by gathering evidence from experts, deliberating, and, when necessary, by preparing short reports.

**CONTACT INFORMATION**

**Andrew Pope**

Director, Board on Health Sciences Policy

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< (b) (6) Baric, Ralph < (b) (6) 'Perlman, Stanley' (b) (6) >; Peter Daszak < (b) (6) zhu huachen < (b) (6) k>; Aubree Gordon < (b) (6) PETERPALESE < (b) (6) 'Krammer, Florian' < (b) (6) Ben Cowling < (b) (6) (b) (6) Baric, Toni C < (b) (6) MASATO HATTA < (b) (6) Gabriele Neumann < (b) (6) < (b) (6) Subbarao, Kanta < (b) (6) Mathur, Punam (NIH/NIAID) [E] < (b) (6) j (b) (6) (b) (6) (b) (6) Hensley, Lisa (NIH/NIAID) [E] < (b) (6) gavin.smith@duke-nus.edu.sg

**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID) (b) (6) Pallansch, Mark A. (CDC/DDID/NCIRD/DVD) (b) (6); Hall, Aron (CDC/DDID/NCIRD/DVD) < (b) (6) Post, Diane (NIH/NIAID) [E] < (b) (6) Embry, Alan (NIH/NIAID) [E] < (b) (6) Lampley, Rebecca (NIH/VRC) [F] < (b) (6) Stemmy, Erik (NIH/NIAID) [E] < (b) (6) Andy Pekosz (b) (6); Topham, David < (b) (6) Gerber, Susan I. (CDC/DDID/NCIRD/DVD) < (b) (6) (b) (6) Bozick, Brooke (NIH/OD) [E] (b) (6); (b) (6)

**Subject:** RE: nCoV weekly investigators meeting

Hello everyone,

As we discussed on the last call, it could be useful to share information certain experimental results, especially animal model work, in as close to real time as possible enable better planning of experiments by the entire group.

During the Zika response, the portal that was used for this was LabKey's Open Research Portal:

(b) (6) This is a fully public portal.

Please consider if this platform might work, and we can discuss on our next call including any logistics and support needed for setting up accounts.

Thank you!

Marciela

-----Original Appointment-----

**From:** Degrace, Marciela (NIH/NIAID) [E]

**Sent:** Friday, January 24, 2020 8:08 AM

**To:** Mark Denison; (b) (6) Johnson, Reed (NIH/NIAID) [E]; Munster, Vincent (NIH/NIAID) [E]; Degrace, Marciela (NIH/NIAID) [E]; Leo Poon; Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6) (b) (6) Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; (b) (6) Orenstein, Walter; Lowen, Anice; Baric, Ralph; 'Perlman, Stanley'; (b) (6) zhu huachen; Aubree Gordon; PETERPALESE; 'Krammer, Florian'; Ben Cowling; (b) (6) (b) (6) Baric, Toni C; MASATO HATTA; Gabriele Neumann ( (b) (6) Subbarao, Kanta; Mathur, Punam (NIH/NIAID) [E]; (b) (6) (b) (6) (b) (6) Hensley, Lisa (NIH/NIAID) [E]; (b) (6)

**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID); Pallansch, Mark A. (CDC/DDID/NCIRD/DVD); Hall, Aron (CDC/DDID/NCIRD/DVD); Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/VRC) [F]; Stemmy, Erik (NIH/NIAID) [E]; Andy Pekosz; Topham, David; Gerber, Susan I.

(CDC/DDID/NCIRD/DVD); (b) (6) Bozick, Brooke (NIH/OD) [E];

(b) (6)

**Subject:** nCoV weekly investigators meeting

**When:** Tuesday, February 18, 2020 9:00 AM-10:00 AM (UTC-05:00) Eastern Time (US & Canada).

**Where:** GoToWebinar

Hi everyone,

Please see updated webinar links below. Hopefully this resolves any issues people had last time with sound.

---

Hello everyone,

Below please find the registration link for our weekly investigators meeting regarding the nCoV.

**Please do not forward.** If you would like anyone else to be added to the invitation, please let me

(b) (6) or Erik ( (b) (6) know.

Our tentative agendas will be:

- Epi Updates
- NIAID Updates
- Other HHS partner Updates, if applicable
- Investigator research updates
- Discussion and Action Items

**\*updated webinar link\***

[https://global.gotomeeting.com/join/\(b\) \(6\)](https://global.gotomeeting.com/join/(b) (6))

**You can also dial in using your phone.**

United States: +1 (b) (6)

**Access Code:** (b) (6)

Thank you,

Marciela DeGrace, Ph.D.

Project Officer, CEIRS

NIH/NIAID/DMID/RDB



**From:** [Alison Andre](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Peter Daszak](#)  
**Subject:** Re: Call with Peter Daszak/EcoHealth Alliance tomorrow?  
**Date:** Thursday, February 20, 2020 4:51:40 PM

---

Hi Erik,

12:00pm still works well for us here. Could you please dial into our conference line?

Dial-in: (b) (6)

Passcode: (b) (6)

Peter, Aleksei, and Hongying will speak to you then.

Thanks!

Alison

On Feb 20, 2020, at 4:32 PM, Stemmy, Erik (NIH/NIAID) [E]  
<(b) (6)> wrote:

Hi Alison,

I think I can make a call at noon tomorrow work. Is that still ok? 2pm I have a conflict.

Erik

---

**From:** Alison Andre (b) (6)  
**Sent:** Thursday, February 20, 2020 12:35 PM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)>  
**Cc:** Peter Daszak <(b) (6)>  
**Subject:** Call with Peter Daszak/EcoHealth Alliance tomorrow?

Hi Erik,

Are you available for a quick call with Peter, Aleksei and Hongying tomorrow (Fri 2/21) to talk about the NIAID supplemental funding? 12:00pm or 2:00pm ET work well for us here but please suggest a couple of times if these are no good for you.

Thanks!

Alison

**Alison Andre**

*Executive Assistant to the President*

EcoHealth Alliance  
460 West 34th Street – 17th floor  
New York, NY 10001

(b) (6) (direct)  
1.212.380.4465 (fax)  
[www.ecohealthalliance.org](http://www.ecohealthalliance.org)

*EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation.*



**From:** [Peter Daszak](#)  
**To:** [Degrace, Marciela \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Leo Poon](#); [Webby, Richard](#); [malik](#); [Ghazi Kayali](#); [Yoshi Kawaoka](#); [R.A.M. Fouchier](#); (b) (6) (b) (6); [Richard Rothman](#); [Pekosz, Andrew S.](#); [Schultz-Cherry, Stacey](#); [david](#); (b) (6) [Orenstein, Walter](#); [Lowen, Anice](#); [Baric, Ralph](#); [Perlman, Stanley](#); [zhu huachen](#); [Aubree Gordon](#); [Munster, Vincent \(NIH/NIAID\) \[E\]](#); [PETERPALESE](#); [Krammer, Florian](#); [Ben Cowling](#); (b) (6) (b) (6) (b) (6) [Baric, Toni C.](#); [MASATO HATTA](#); [Gabriele Neumann](#); (b) (6) [Subbarao, Kanta](#); [Mathur, Punam \(NIH/NIAID\) \[E\]](#); [Fry, Alicia \(CDC/DDID/NCIRD/ID\)](#); [Pallansch, Mark A. \(CDC/DDID/NCIRD/DVD\)](#); [Hall, Aron \(CDC/DDID/NCIRD/DVD\)](#); [Post, Diane \(NIH/NIAID\) \[E\]](#); [Embry, Alan \(NIH/NIAID\) \[E\]](#); [Lampley, Rebecca \(NIH/NIAID\) \[C\]](#); [Stemmv, Erik \(NIH/NIAID\) \[E\]](#); [Andy Pekosz](#); [Topham, David](#); [Gerber, Susan I. \(CDC/DDID/NCIRD/DVD\)](#); (b) (6)  
**Subject:** Re: virus isolate availability- update  
**Date:** Tuesday, February 11, 2020 7:13:58 AM

---

Some of us are at the WHO R&D Blueprint meeting in Geneva today. I see that Stan Perlman, Kanta Subbarao and others from NIH are in the room. The goal is to set research priorities across everything from animal reservoir to drug/vaccine to social science. We're in breakout groups this afternoon and hopefully can call in for some of the meeting and give a quick update.

Cheers,

Peter

Peter Daszak  
(Sent from my iPhone)

President  
EcoHealth Alliance

460 West 34th Street, New York, NY 10001, USA

[www.EcoHealthAlliance.org](http://www.EcoHealthAlliance.org)

On Feb 7, 2020, at 4:49 PM, Degrace, Marciela (NIH/NIAID) [E]  
<(b) (6)> wrote:

Hello everyone,

Many of you have asked about availability of virus isolates, and I wanted to provide an update. A 2019-nCoV virus isolate is now available for order in the BEI Resources Repository here: <https://www.beiresources.org/Catalog/animalviruses/NR-52281.aspx>  
Have a great weekend, and looking forward to speaking with you all next Tuesday,  
Marciela

-----Original Appointment-----

**From:** Degrace, Marciela (NIH/NIAID) [E]

**Sent:** Friday, January 24, 2020 8:08 AM

**To:** Degrace, Marciela (NIH/NIAID) [E]; Leo Poon; Webby, Richard; malik; Ghazi Kayali;

Yoshi Kawaoka; R.A.M. Fouchier; (b) (6) (b) (6)  
Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey;  
(b) (6); Orenstein, Walter; Lowen, Anice; Baric, Ralph;  
'Perlman, Stanley'; (b) (6) zhu huachen; Aubree Gordon;  
Munster, Vincent (NIH/NIAID) [E]; PETERPALESE; 'Krammer, Florian'; Ben Cowling;  
(b) (6) (b) (6) (b) (6) Baric,  
Toni C; MASATO HATTA; Gabriele Neumann ( (b) (6) Subbarao,  
Kanta; Mathur, Punam (NIH/NIAID) [E]

**Cc:** Fry, Alicia (CDC/DDID/NCIRD/ID); Pallansch, Mark A. (CDC/DDID/NCIRD/DVD); Hall,  
Aron (CDC/DDID/NCIRD/DVD); Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E];  
Lampley, Rebecca (NIH/VRC) [F]; Stemmy, Erik (NIH/NIAID) [E]; Andy Pekosz; Topham,  
David; Gerber, Susan I. (CDC/DDID/NCIRD/DVD); (b) (6)

**Subject:** nCoV weekly investigators meeting

**When:** Tuesday, February 4, 2020 9:00 AM-10:00 AM (UTC-05:00) Eastern Time (US &  
Canada).

**Where:** GoToWebinar

Hello everyone,

Below please find the registration link for our weekly investigators meeting regarding  
the nCoV. **Please do not forward.** If you would like anyone else to be added to the  
invitation, please let me ( (b) (6) or Erik (b) (6)  
know.

Our tentative agendas will be:

- Epi Updates
- NIAID Updates
- Other HHS partner Updates, if applicable
- Investigator research updates
- Discussion and Action Items

Thank you,

Marciela DeGrace, Ph.D.

Project Officer, CEIRS

NIH/NIAID/DMID/RDB

**\*updated webinar information\***

[https://global.gotomeeting.com/join/\(b\) \(6\)](https://global.gotomeeting.com/join/(b) (6))

**You can also dial in using your phone.**

United States: (b) (6)

**Access Code:** (b) (6)



**From:** [Peter Daszak](#)  
**To:** [Morens, David \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Alison Andre](#)  
**Subject:** More on Wuhan novel coronavirus - NIAID's role in bat-origin CoVs  
**Date:** Monday, January 27, 2020 5:49:34 PM  
**Importance:** High

---

Great to hear back, and of course this is all confidential. Erik – hope you don't mind this communication, and please share with your Head of Dept if you like

Re. the likely final size of this outbreak – here are the key metrics I'm looking at:

1. Mortality rate – Currently around 2-3%, which is not bad compared with the 7+% of SARS
2. Secondary outbreaks: So far, no evidence that international travelers have seeded de novo transmission within destination countries. In the richer countries, USA, Canada, Europe, Japan, Australia, I expect that Port Authority surveillance will catch most with symptoms and follow up will mop up secondary cases for the few that get through. My concern is for SE Asian and African countries that our Flight Risk Tracker predicted arrivals earlier in the outbreak (see figure attached) – <https://flirt.aha.io> (funded by DHS and DoD DTRA).
3. Transparency from China: Good rapid response, open sharing of information (albeit that this was once they'd all got their initial high-impact papers accepted). They're working with WHO, and WHO is holding regular meetings on sharing samples/reagents/viruses (organized via WHO R&D Blueprint group that I'm part of), as well as PHEIC meetings.
4. Travel ban: This is a significant difference to SARS, and although the virus had already traveled, the lockdown of Wuhan and many other places/sites during the New Year festivities is a remarkable move that has to have had a big impact on reducing spread.

So, for those reasons I'm cautiously optimistic that this will end up with a max of around 15-20,000 total cases identified (most mild), only a couple of examples of secondary transmission, and a lower mortality rate once all the cases are accounted for (1-2%). There'll still be a temporary shock to the global economy, and this is already similar to SARS (10% hit on airline stocks etc), but that's prob due to massive increase in travel from China to most other destinations since SARS, and to increase in social media and hype. Should settle down once we're over the peak of the epidemic curve.

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

460 West 34<sup>th</sup> Street – 17<sup>th</sup> Floor

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Twitter: [@PeterDaszak](#)

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---

**From:** Morens, David (NIH/NIAID) [E] [mailto:(b) (6)]  
**Sent:** Monday, January 27, 2020 4:54 PM  
**To:** Peter Daszak  
**Cc:** Stemmy, Erik (NIH/NIAID) [E]; Alison Andre

**Subject:** RE: Wuhan novel coronavirus - NIAID's role in bat-origin CoVs

Great info, thanks. Tony doesn't maintain awareness of these things and doesn't know unless program officers tell him, which they rarely do, since they are across town and may not see him more than once a year, or less....

(b) (4)

Interested in your feeling about where this is going. The experts buzzing around us are all over the map, between doomsday and not that big a deal, with everything in between.



**David M. Morens, M.D.**

CAPT, United States Public Health Service

Senior Advisor to the Director

Office of the Director

National Institute of Allergy and Infectious Diseases

National Institutes of Health

Building 31, Room 7A-03

31 Center Drive, MSC 2520

Bethesda, MD 20892-2520



(b) (6) (assistants: Kimberly Barasch; Whitney Robinson)



301 496 4409



(b) (6)

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(b) (6)

**From:** Peter Daszak (b) (6)  
**Sent:** Monday, January 27, 2020 1:36 PM  
**To:** Morens, David (NIH/NIAID) [E] <(b) (6)>  
**Cc:** Stemmy, Erik (NIH/NIAID) [E] <(b) (6)> Alison Andre  
(b) (6)

**Subject:** Wuhan novel coronavirus - NIAID's role in bat-origin CoVs

**Importance:** High

Hi David – Happy to have a phone call re. the Wuhan CoV, but just wanted to mentioned a few things for your information and hopefully to pass on to Tony Fauci for when he's being interviewed re. the new CoV:

NIAID has been funding coronavirus work in China for the past 5 years through an R01 to me (1R01AI110964: "Understanding the Risk of Bat Coronavirus Emergence"). That's now been renewed, with a specific focus that we identify cohorts of people highly exposed to bats in China, and work out if they're getting sick from CoVs. Erik Stemmy is the Program Officer (cc'd here). Collaborators include Wuhan Institute of Virology (currently working on the nCoV), and Ralph Baric. The results of our work to date include:

(b) (4)

- Discovered Swine Acute Diarrheal Syndrome Virus (SADS-CoV) killing >25,000 pigs in Guangdong Province (Published in Nature)
- Found SARS-related CoVs that can bind to human cells (Published in Nature), and that cause SARS-like disease in humanized mouse models.

(b) (4)

Also – FYI, prior to the R01, we worked under an R01 with Eun-Chung Park as Program Officer on viral discovery in bats, where originally identified SARS-CoV as having a likely origin in bats (published in Science)

As I mentioned, I'm now part of a group that's meeting by phone weekly with CEIRS to discuss the nCoV and Erik's part of that.

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

460 West 34<sup>th</sup> Street – 17<sup>th</sup> Floor

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---

**From:** Morens, David (NIH/NIAID) [E] [REDACTED] (b) (6)

**Sent:** Thursday, January 9, 2020 1:36 PM

**To:** Peter Daszak; Ian Lipkin ([REDACTED] (b) (6)); Jon Epstein

**Subject:** RE: Wuhan virus

Thanks, the excitement never ends, right?

*David*

**David M. Morens, M.D.**

CAPT, United States Public Health Service

Senior Advisor to the Director

Office of the Director

National Institute of Allergy and Infectious Diseases

National Institutes of Health

Building 31, Room 7A-03

31 Center Drive, MSC 2520

Bethesda, MD 20892-2520



[REDACTED] (b) (6) (assistants: Kimberly Barasch; Whitney Robinson)



301 496 4409



[REDACTED] (b) (6)

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(b) (6)

---

**From:** Peter Daszak (b) (6)  
**Sent:** Thursday, January 9, 2020 12:57 PM  
**To:** Morens, David (NIH/NIAID) [E] (b) (6); Ian Lipkin (b) (6)  
(b) (6); Jon Epstein (b) (6)  
**Subject:** RE: Wuhan virus

**Importance:** High

Yes – lots of information and I spoke with Erik Stemmy and Alan Embry yesterday before the news was released. Erik is my program officer on our coronavirus grant specifically focused on China. I've been talking with reporters today and happy to fill you in on any further information...

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

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New York, NY 10001

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Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

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*EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that prevent pandemics and promote conservation.*

---

**From:** Morens, David (NIH/NIAID) [E] [\(mailto:\(b\) \(6\)\)](mailto:(b) (6))  
**Sent:** Thursday, January 9, 2020 12:50 PM  
**To:** W. Ian Lipkin (b) (6); Peter Daszak; Jon Epstein  
**Subject:** Wuhan virus

Hi guys, do any of you have any inside info on this new coronavirus that isn't yet in the public domain? Or any thoughts?

TY,




**David M. Morens, M.D.**

CAPT, United States Public Health Service

Senior Advisor to the Director

Office of the Director

National Institute of Allergy and Infectious Diseases  
National Institutes of Health  
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31 Center Drive, MSC 2520  
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 301 496 4409

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(b) (6)





**From:** [Peter Daszak](#)  
**To:** [Degrace, Marciela \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Post, Diane \(NIH/NIAID\) \[E\]](#); [Embry, Alan \(NIH/NIAID\) \[E\]](#); [Lampley, Rebecca \(NIH/VRC\) \[F\]](#); [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Baric, Toni C](#)  
**Subject:** RE: Question re. Wuhan weekly investigator calls  
**Date:** Monday, January 27, 2020 2:39:24 PM

---

Thanks Marciela, will do.

FYI her email address is [REDACTED] (b) (6)

Cheers,

Peter

**Peter Daszak**

*President*

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460 West 34<sup>th</sup> Street – 17<sup>th</sup> Floor

New York, NY 10001

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---

**From:** Degrace, Marciela (NIH/NIAID) [E] [mailto:[REDACTED] (b) (6)]

**Sent:** Monday, January 27, 2020 2:25 PM

**To:** Peter Daszak

**Cc:** Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/VRC) [F]; Stemmy, Erik (NIH/NIAID) [E]; Baric, Toni C

**Subject:** RE: Question re. Wuhan weekly investigator calls

Hi Peter,

It would be great for Hongying to join the calls. Please feel free to forward the invitation along to her.

Looking forward to speaking to you tomorrow,

Marciela

---

**From:** Peter Daszak [REDACTED] (b) (6)

**Sent:** Monday, January 27, 2020 10:41 AM

**To:** Degrace, Marciela (NIH/NIAID) [E] <[REDACTED] (b) (6)>

**Cc:** Post, Diane (NIH/NIAID) [E] <[REDACTED] (b) (6)> Embry, Alan (NIH/NIAID) [E]

<[REDACTED] (b) (6)> Lampley, Rebecca (NIH/VRC) [F] <[REDACTED] (b) (6)> Stemmy,

Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)> Baric, Toni C <[REDACTED] (b) (6)>

**Subject:** Question re. Wuhan weekly investigator calls

**Importance:** High

Would it be ok for the project coordinator of our NIAID CoV R01 join these calls. Her name is Hongying Li, she's an epidemiologist who manages and coordinates all the human and wildlife testing, contracts, IRBs/IACUCs etc. for this work as well as for our work under PREDICT. She's a Chinese National, and has been here for about 4 years since her MPH at Emory, [REDACTED] (b) (6)

I'd like her to join so she can help with any issues around the politics in China on sample/reagent

sharing, talking with researchers etc. She's very good at seeing through the reports from China to understand what's really going on there – and she's very discreet and confidential.

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

460 West 34<sup>th</sup> Street – 17<sup>th</sup> Floor

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---

**From:** Baric, Ralph S [[\(mailto:\(b\) \(6\)\)](mailto:(b) (6))]

**Sent:** Thursday, January 23, 2020 6:35 PM

**To:** Peter Daszak; Degrace, Marciela (NIH/NIAID) [E]; Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6) Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; (b) (6) Orenstein, Walter; Lowen, Anice; 'Perlman, Stanley'; zhu huachen; Aubree Gordon; vincent.munster\_nih.gov (b) (6)

**Cc:** Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/VRC) [F]; Stemmy, Erik (NIH/NIAID) [E]; Baric, Toni C

**Subject:** RE: Wuhan - scheduling weekly investigator calls

I can likely do either Tuesday or wed at 9. ralph

---

**From:** Peter Daszak <(b) (6)>

**Sent:** Thursday, January 23, 2020 3:38 PM

**To:** Degrace, Marciela (NIH/NIAID) [E] (b) (6) Webby, Richard

<(b) (6) malik <(b) (6) Ghazi Kayali <(b) (6)

Yoshi Kawaoka <(b) (6) R.A.M. Fouchier <(b) (6)

(b) (6) Richard Rothman (b) (6) Pekosz, Andrew S.

(b) (6); Schultz-Cherry, Stacey (b) (6)

(b) (6) Orenstein, Walter <(b) (6) Lowen, Anice

<(b) (6) Baric, Ralph S (b) (6) 'Perlman, Stanley' <(b) (6)

(b) (6) zhu huachen <(b) (6) Aubree Gordon <(b) (6)

(b) (6)

**Cc:** Post, Diane (NIH/NIAID) [E] (b) (6) Embry, Alan (NIH/NIAID) [E]

<(b) (6) Lampley, Rebecca (NIH/VRC) [F] (b) (6) Stemmy,

Erik (NIH/NIAID) [E] <(b) (6)

**Subject:** RE: Wuhan - scheduling weekly investigator calls

Thanks Marciela – I can definitely do Wednesdays at 9am, but Mondays clash with other standing meetings.

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance



460 West 34<sup>th</sup> Street – 17<sup>th</sup> Floor  
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---

**From:** Degrace, Marciela (NIH/NIAID) [E] [[mailto:\[REDACTED\]](mailto:[REDACTED])] (b) (6)

**Sent:** Thursday, January 23, 2020 10:33 AM

**To:** Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; 'adolfo.garcia-sastre@mssm.edu'; Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey;

[REDACTED] (b) (6) Orenstein, Walter; Lowen, Anice; Baric, Ralph; 'Perlman, Stanley'; Peter Daszak; zhu huachen; Aubree Gordon; vincent.munster\_nih.gov [REDACTED] (b) (6)

**Cc:** Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/VRC) [F]; Stemmy, Erik (NIH/NIAID) [E]

**Subject:** Wuhan - scheduling weekly investigator calls

**Importance:** High

Hi everyone,

Given the escalating rate of infections with the new coronavirus, we would like to plan a **weekly meeting** with investigators working on coronaviruses. Our hopes is that we can all share information we have regarding research and sample progress on the virus, and we at NIAID can share any information and resource updates with all of you.

I know everyone's schedules are quite busy at this point. Given the time zones everyone works in we are thinking **Tuesdays at 9am** or **Wednesdays at 9am**. Please let me know by Friday if you have any strong preference, and we will get an invitation and call in sent out for next week.

Thank you!

Marciela and Erik

**From:** [Peter Daszak](#)  
**To:** [Morens, David \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Alison Andre](#)  
**Subject:** Wuhan novel coronavirus - NIAID's role in bat-origin CoVs  
**Date:** Monday, January 27, 2020 1:37:37 PM  
**Importance:** High

---

Hi David – Happy to have a phone call re. the Wuhan CoV, but just wanted to mention a few things for your information and hopefully to pass on to Tony Fauci for when he's being interviewed re. the new CoV:

NIAID has been funding coronavirus work in China for the past 5 years through an R01 to me (1R01AI110964: "Understanding the Risk of Bat Coronavirus Emergence"). That's now been renewed, with a specific focus that we identify cohorts of people highly exposed to bats in China, and work out if they're getting sick from CoVs. Erik Stemmy is the Program Officer (cc'd here). Collaborators include Wuhan Institute of Virology (currently working on the nCoV), and Ralph Baric. The results of our work to date include:

 (b) (4)

- Discovered Swine Acute Diarrheal Syndrome Virus (SADS-CoV) killing >25,000 pigs in Guangdong Province (Published in Nature)
- Found SARS-related CoVs that can bind to human cells (Published in Nature), and that cause SARS-like disease in humanized mouse models.

 (b) (4)

Also – FYI, prior to the R01, we worked under an R01 with Eun-Chung Park as Program Officer on viral discovery in bats, where originally identified SARS-CoV as having a likely origin in bats (published in Science)

As I mentioned, I'm now part of a group that's meeting by phone weekly with CEIRS to discuss the nCoV and Erik's part of that.

Cheers,

Peter

**Peter Daszak**

*President*

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---

**From:** Morens, David (NIH/NIAID) [E] [mailto: (b) (6)]  
**Sent:** Thursday, January 9, 2020 1:36 PM  
**To:** Peter Daszak; Ian Lipkin ( (b) (6) Jon Epstein  
**Subject:** RE: Wuhan virus

Thanks, the excitement never ends, right?

*David*

**David M. Morens, M.D.**

CAPT, United States Public Health Service  
Senior Advisor to the Director  
Office of the Director  
National Institute of Allergy and Infectious Diseases  
National Institutes of Health  
Building 31, Room 7A-03  
31 Center Drive, MSC 2520  
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 (b) (6) (assistants: Kimberly Barasch; Whitney Robinson)

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 (b) (6)

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(b) (6)

---

**From:** Peter Daszak < (b) (6) >  
**Sent:** Thursday, January 9, 2020 12:57 PM  
**To:** Morens, David (NIH/NIAID) [E] < (b) (6) > Ian Lipkin ( (b) (6) < (b) (6) >  
< (b) (6) > Jon Epstein < (b) (6) >  
**Subject:** RE: Wuhan virus

**Importance:** High

Yes – lots of information and I spoke with Erik Stemmy and Alan Embry yesterday before the news was released. Erik is my program officer on our coronavirus grant specifically focused on China. I've been talking with reporters today and happy to fill you in on any further information...

Cheers,

Peter

**Peter Daszak**

*President*

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---

**From:** Morens, David (NIH/NIAID) [E] [[\(b\) \(6\)](mailto:(b) (6))]

**Sent:** Thursday, January 9, 2020 12:50 PM

**To:** W. Ian Lipkin (b) (6); Peter Daszak; Jon Epstein

**Subject:** Wuhan virus

Hi guys, do any of you have any inside info on this new coronavirus that isn't yet in the public domain? Or any thoughts?

TY,



**David M. Morens, M.D.**

CAPT, United States Public Health Service

Senior Advisor to the Director

Office of the Director

National Institute of Allergy and Infectious Diseases

National Institutes of Health

Building 31, Room 7A-03

31 Center Drive, MSC 2520

Bethesda, MD 20892-2520



(b) (6) (assistants: Kimberly Barasch; Whitney Robinson)



301 496 4409



(b) (6)

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**From:** Peter Daszak  
**To:** Degrace, Marciela (NIH/NIAID) [E]; Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6); Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; "david (b) (6) Orenstein, Walter; Lowen, Anice; Baric, Ralph; 'Perلمان, Stanley'; zhu huachen; Aubree Gordon; Munster, Vincent (NIH/NIAID) [E]  
**Cc:** Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/VRC) [F]; Stemmy, Erik (NIH/NIAID) [E]  
**Subject:** RE: Wuhan - scheduling weekly investigator calls  
**Date:** Thursday, January 23, 2020 3:38:11 PM

---

Thanks Marciela – I can definitely do Wednesdays at 9am, but Mondays clash with other standing meetings.

Cheers,

Peter

**Peter Daszak**

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---

**From:** Degrace, Marciela (NIH/NIAID) [E] [mailto:(b) (6)]  
**Sent:** Thursday, January 23, 2020 10:33 AM  
**To:** Webby, Richard; malik; Ghazi Kayali; Yoshi Kawaoka; R.A.M. Fouchier; (b) (6); (b) (6); Richard Rothman; Pekosz, Andrew S.; Schultz-Cherry, Stacey; (b) (6) Orenstein, Walter; Lowen, Anice; Baric, Ralph; 'Perلمان, Stanley'; Peter Daszak; zhu huachen; Aubree Gordon; (b) (6)  
**Cc:** Post, Diane (NIH/NIAID) [E]; Embry, Alan (NIH/NIAID) [E]; Lampley, Rebecca (NIH/VRC) [F]; Stemmy, Erik (NIH/NIAID) [E]  
**Subject:** Wuhan - scheduling weekly investigator calls  
**Importance:** High

Hi everyone,

Given the escalating rate of infections with the new coronavirus, we would like to plan a **weekly meeting** with investigators working on coronaviruses. Our hopes is that we can all share information we have regarding research and sample progress on the virus, and we at NIAID can share any information and resource updates with all of you.

I know everyone's schedules are quite busy at this point. Given the time zones everyone works in we are thinking **Tuesdays at 9am** or **Wednesdays at 9am**. Please let me know by Friday if you have any strong preference, and we will get an invitation and call in sent out for next week.

Thank you!

Marciela and Erik



**From:** [Alison Andre](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Peter Daszak](#)  
**Subject:** Re: could I give you a quick call today with an idea re. Wuhan nCoV?  
**Date:** Thursday, January 23, 2020 8:57:58 AM

---

Hi Erik,

If you could call Peter on his cell phone at 1:00pm today, that would be great. Number is

(b) (6)

Thanks!

Alison

**Alison Andre**

*Executive Assistant to the President*

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---

**From:** "Stemmy, Erik (NIH/NIAID) [E]" <(b) (6)>

**Date:** Thursday, January 23, 2020 at 8:11 AM

**To:** Peter Daszak <(b) (6)>

**Cc:** Alison Andre <(b) (6)>

**Subject:** Re: could I give you a quick call today with an idea re. Wuhan nCoV?

Hi Peter,

I can definitely make time for you in that window. At a site visit currently, but how about if we say around 1?

Let me know where to reach you.

Erik

Sent from my iPhone

On Jan 23, 2020, at 8:00 AM, Peter Daszak <(b) (6)> wrote:

Hi Erik,

Would it be possible to have a call with you today re. the Wuhan nCoV. I'm working on our plans for surveillance and want to check in re. supplemental funds to expand the geographic sampling scope.

I'm available from 12.30-5pm if you're around today..

Cheers,

Peter

**Peter Daszak**

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**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [Baric, Ralph](#); [Perlman, Stanley](#)  
**Subject:** RE: CoV Sample Priorities  
**Date:** Wednesday, January 22, 2020 2:56:13 PM  
**Attachments:** [USG 2019-nCoV sample needs Daszak EcoHealth Alliance.xlsx](#)  
**Importance:** High

---

Hi Erik – I spoke with Ralph and he shared his filled out template. So first, I'd like to strongly support his requests because the better he can do his work on analyzing spike proteins etc., the better our modeling and analytics on viral origins becomes.

I also filled out a form for EcoHealth, but as you know we are not directly doing the lab work here, so we're not asking for samples, but rather I've inserted some of our capacities and my contact and Hongying's contact details, just for the file...

V. busy right now dealing with journalists and getting ready for wildlife sampling in China at the first opportunity.

Cheers,

Peter

**Peter Daszak**

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] [<mailto:> (b) (6)]

**Sent:** Monday, January 20, 2020 12:19 PM

**To:** Baric, Ralph; Peter Daszak; Perlman, Stanley

**Subject:** CoV Sample Priorities

Hi Ralph, Peter, and Stanley,

We have been asked by HHS to put together a list of samples that would be high priority for us to have for the Wuhan Coronavirus. This is a hypothetical wish-list at the moment, but it could be helpful as the USG works to get samples from China or other countries where there have been cases. This list is mainly geared towards NIH intramural investigators, but we've been asked to reach out to a few folks in the extramural community as well. If you are interested, could you please look at the attached spreadsheet and fill out the types of samples, minimum volume, and capabilities columns? We'll use this internally in DMID to populate the list that HHS is putting together.

Thank you!

Erik

Erik J. Stemmy, Ph.D.

Program Officer

Respiratory Diseases Branch

Division of Microbiology and Infectious Diseases NIAID/NIH/HHS

5601 Fishers Lane, Room 8E18

**Novel Coronavirus (2019-nCoV) Sample Needs**

Agency/Division/ Lab	Description of activity/gap for which physical samples are needed	Priority of activity (if multiple activities listed)	Type of samples needed	Minimum volume of sample needed for each sample type	Will the outputs of the proposed activity (e.g., reagents developed) be made available to partners? If yes, will they be made available to domestic partners, international or both.	Capabilities your lab possesses and can share with potential collaborators for responding to the 2019-nCoV	Point of contact		
							Name	Phone #	Email
EcoHealth Alliance	N/A	N/A	N/A	N/A		Epidemiology, wildlife sampling, model human behavioral risk, human sampling	Peter Das Hongying J		

(b) (6)

Bethesda, MD 20892-9825

Phone: (b) (6)

Email: (b) (6)

Getting ready to publish? Share the good news with your program officer asap! NIAID may be able to help publicize your article. And, remember to list your NIAID grant or contract number in the publication.

\*\*\*\*\*

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**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Kevin Olival](#); [Robert Kessler](#); [Baric, Ralph](#)  
**Subject:** RE: Wuhan Pneumonia  
**Date:** Tuesday, January 14, 2020 8:15:25 AM

---

Not yet re. samples closer to Wuhan for Rp3-like CoVs.

I think the concern is that there is probably a low level exposure to these bat-origin viruses across southern and central China.

I'll be on the call at 10 am today – will you be?

Cheers,

Peter

**Peter Daszak**

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] [mailto:(b) (6)]  
**Sent:** Monday, January 13, 2020 7:46 AM  
**To:** Peter Daszak  
**Cc:** Kevin Olival; Robert Kessler; Baric, Ralph  
**Subject:** Re: Wuhan Pneumonia

Thanks Peter. That's good to know. Have you also checked for Rp3 in samples from places closer to Wuhan?

Sent from my iPhone

On Jan 12, 2020, at 12:35 PM, Peter Daszak <(b) (6)> wrote:

Thanks Erik – we've posted a phylogeny based on that and it's been circulating on the web now.

<https://www.ecohealthalliance.org/2020/01/phylogenetic-analysis-shows-novel-wuhan-coronavirus-clusters-with-sars>

Key points from our point of view:

- This novel virus falls within the SARS-CoV and SAR-related CoV clade, in contrast to statements put out by some of the Chinese groups that this is 'not related to SARS'
- It's close to SARr-CoV Rp3 that we published from our past NIAID work. This came from a Rhinolophus bat in S. China
- We have found antibodies to Rp3 in people in Yunnan Province previously, suggesting that these viruses are actively spilling over across a wider interface



than currently known

You should also know that Ralph Baric (cc'd here) is already working to reconstruct and rescue the virus in the lab from the sequence, so he can do further work on it.

We'll keep you posted of course...

Cheers,

Peter

**Peter Daszak**

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] [[mailto:\[REDACTED\]](mailto:[REDACTED])] (b) (6)

**Sent:** Friday, January 10, 2020 10:30 PM

**To:** Peter Daszak

**Subject:** Re: Wuhan Pneumonia

Hi Peter,

We just received the fasta file with the sequence data, and I wanted to share it with you.

Erik

<http://virological.org/t/initial-genome-release-of-novel-coronavirus/319>

Sent from my iPhone

On Jan 8, 2020, at 11:08 PM, Peter Daszak <[REDACTED] (b) (6)> wrote:

Erik – just to let you know that WSJ has now reported the novel CoV in 2 of the patients, citing “sources close to the investigation”. There are few details, and no more than I gave you today, so plenty of information still to wait for from our colleagues in China..

I've put out some tweets about it on @PeterDaszak if you want to take a look..

Cheers,

Peter

**Peter Daszak**

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] [mailto:(b) (6)]

**Sent:** Wednesday, January 8, 2020 3:22 PM

**To:** Alison Andre; Peter Daszak

**Subject:** RE: Wuhan Pneumonia

Great! I think the number I sent you should work. I'll grab one of our conference rooms and sign in there. If not, the direct line to the conference room should be: (b) (6)

Thank you!

Erik

---

**From:** Alison Andre <(b) (6)>

**Sent:** Wednesday, January 8, 2020 3:17 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] (b) (6) Peter Daszak

(b) (6)

**Subject:** Re: Wuhan Pneumonia

Hi Erik,

Just spoke to Peter and it would be great to have Dr. Embry join the call. Does the number still work for the both of you or would you like me to reserve a conference line?

Thanks,

Alison

---

**From:** "Stemmy, Erik (NIH/NIAID) [E]" <(b) (6)>

**Date:** Wednesday, January 8, 2020 at 1:41 PM

**To:** Peter Daszak (b) (6), Alison Andre

<(b) (6)>

**Subject:** RE: Wuhan Pneumonia

Thanks Peter, me too. I'd mentioned our call to my branch chief, Dr Alan Embry. We'd been talking about your CoV work in Asia even before the news from Wuhan broke, and he's been interested in meeting you. Would you mind if he joined our call this afternoon as well? Seems like a good opportunity to make the introduction, but we can do it another time if you'd rather just speak with me.

Erik

---

**From:** Peter Daszak <(b) (6)>

**Sent:** Tuesday, January 7, 2020 4:24 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)> Alison Andre  
<[REDACTED] (b) (6)>

**Subject:** RE: Wuhan Pneumonia

Look forward to talking with you tomorrow Erik...

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] [[@mailto:\[REDACTED\] \(b\) \(6\)](mailto:[REDACTED] (b) (6))]

**Sent:** Tuesday, January 7, 2020 2:54 PM

**To:** Alison Andre; Peter Daszak

**Subject:** RE: Wuhan Pneumonia

Sure, that's perfect. He can reach me at [REDACTED] (b) (6)

Thanks!

Erik

---

**From:** Alison Andre <[REDACTED] (b) (6)>

**Sent:** Tuesday, January 7, 2020 2:52 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] [REDACTED] (b) (6) Peter Daszak

[REDACTED] (b) (6)

**Subject:** Re: Wuhan Pneumonia

Hi Erik,

Can Peter give you a call around 3:30 tomorrow? If that works for you, please let me know the best number to reach you on.

Thanks!

Alison

---

**From:** "Stemmy, Erik (NIH/NIAID) [E]" <[REDACTED] (b) (6)>

**Date:** Tuesday, January 7, 2020 at 2:49 PM

**To:** Peter Daszak <[REDACTED] (b) (6)>

**Cc:** Alison Andre [REDACTED] (b) (6)

**Subject:** RE: Wuhan Pneumonia

That would be great! Thank you for getting back to me. I wasn't sure if you were traveling or not, so I'd also reached out to Aleksei. I can be pretty flexible tomorrow, so just let me know what time works for you. Very much appreciate your time!

Erik

**From:** Peter Daszak [REDACTED] (b) (6)

**Sent:** Tuesday, January 7, 2020 2:48 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED]> (b) (6)

**Cc:** Alison Andre <[REDACTED]> (b) (6)

**Subject:** RE: Wuhan Pneumonia

Definitely focusing attention on this Erik – I spent New Year's Eve talking with our China contacts, and with ProMED staff between glasses!

I've got more information, but it's all off the record. Could I give you a call tomorrow to fill you in? I've cc'd Alison Andre who can arrange a time that works for a quick call....

Cheers,

Peter

**Peter Daszak**

*President*

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] [[mailto:\[REDACTED\]](mailto:[REDACTED])] (b) (6)

**Sent:** Monday, January 6, 2020 7:28 AM

**To:** Peter Daszak

**Subject:** Wuhan Pneumonia

Hi Peter,

Happy New Year! I'm sure you've been following along with the Wuhan pneumonia cases, and I wanted to see if you had any information from your contacts over there. I saw SARS and MERS had been ruled out, but curious to know if there's any indication you've seen that another bat CoV might be involved.

Erik

Erik J. Stemmy, Ph.D.

Program Officer

Respiratory Diseases Branch

Division of Microbiology and Infectious Diseases NIAID/NIH/HHS

5601 Fishers Lane, Room 8E18

Bethesda, MD 20892-9825

Phone: [REDACTED] (b) (6)

Email: [REDACTED] (b) (6)

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\*\*\*\*\*

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**From:** [Aleksei Chmura](#)  
**To:** [Stemmy, Erik \(NIH/NIAD\) \[E\]](#)  
**Subject:** Out of Office Re: FW: Wuhan Pneumonia  
**Date:** Tuesday, January 7, 2020 2:49:18 PM

---

Thank you for your email.

I will be out of the office and traveling from the 7th to the 16th of January 2020. During this time, I will not have regular access to emails and voice messages.

If you should need immediate assistance, please contact Alison Andre at (b) (6). Otherwise, I will respond to your message as soon as possible.

Sincerely,

- Aleksei

--

**Aleksei Chmura, PhD**  
*Chief of Staff*

EcoHealth Alliance  
460 West 34th Street – 17th floor  
New York, NY 10001

(b) (6) direct  
(b) (6) mobile  
Aleksei MacDurian (Skype)

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**From:** [Aleksi Chmura](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Subject:** Re: Quick call today or tomorrow?  
**Date:** Thursday, July 25, 2019 9:15:59 AM

---

Super!

-Aleksi

On Jul 25, 2019, at 09:09, Stemmy, Erik (NIH/NIAID) [E]

<[REDACTED] (b) (6)> wrote:

That's great. Thanks!

Erik

---

**From:** Aleksi Chmura <[REDACTED] (b) (6)>  
**Sent:** Thursday, July 25, 2019 9:06 AM  
**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED] (b) (6)>  
**Cc:** Peter Daszak <[REDACTED] (b) (6)> Alison Andre  
<[REDACTED] (b) (6)>

**Subject:** Re: Quick call today or tomorrow?

Thanks, Erik!

Peter could call you at 12:15 this afternoon - at [REDACTED] (b) (6)

Cheers,

-Aleksi

**Aleksi Chmura, PhD**  
*Chief of Staff*

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On Jul 25, 2019, at 07:41, Stemmy, Erik (NIH/NIAID) [E]

[REDACTED] (b) (6)> wrote:

Hi Peter,

I was a bit swamped yesterday, but have some time today if you'd still like to chat. I can do any time before 10am today, or between 12:15 and 2pm.

Let me know if any of those times work.

Erik

---

**From:** Peter Daszak <[REDACTED]> (b) (6)

**Sent:** Wednesday, July 24, 2019 1:53 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED]> (b) (6)

**Cc:** Alison Andre <[REDACTED]> (b) (6) Aleksei Chmura

<[REDACTED]> (b) (6)

**Subject:** Quick call today or tomorrow?

Hi Erik,

We're delighted that we've received the NIAID award and I wanted to have a quick chat with you to go through some of the details. Any chance you're available for a call sometime this afternoon or anytime tomorrow?

Cheers,

Peter

**Peter Daszak**

*President*

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**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Aleksei Chmura](#)  
**Subject:** RE: R01 renewal application 2 R01 AI110964-06  
**Date:** Tuesday, February 26, 2019 2:59:37 PM

---

Thanks Erik – fully understand and glad you confirmed my score – I was just checking because the percentile looked so high. Very nice to score well!!

Cheers,

Peter

**Peter Daszak**

*President*

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Twitter: [@PeterDaszak](#)

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---

**From:** Stemmy, Erik (NIH/NIAID) [E] [mailto:(b) (6)]  
**Sent:** Tuesday, February 26, 2019 1:35 PM  
**To:** Peter Daszak  
**Cc:** Aleksei Chmura  
**Subject:** RE: R01 renewal application 2 R01 AI110964-06

Hi Peter,

Yes, that's very good news. Your renewal application did score within payline. There's still a ways to go before an award would be made, so nothing is set until the notice of award goes out.

Best,

Erik

Erik J. Stemmy, Ph.D.

Program Officer

Respiratory Diseases Branch

Division of Microbiology and Infectious Diseases NIAID/NIH/HHS

5601 Fishers Lane, Room 8E18

Bethesda, MD 20892-9825

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\*\*\*\*\*

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**From:** Peter Daszak [REDACTED] (b) (6)

**Sent:** Tuesday, February 26, 2019 1:19 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] <[REDACTED]> (b) (6)

**Cc:** Aleksei Chmura [REDACTED] (b) (6)

**Subject:** R01 renewal application 2 R01 AI110964-06

**Importance:** High

Hi Erik – I just want to check with you that I read my ERA commons score correctly. From what I see the renewal proposal [REDACTED] (b) (5) is that correct from your memory of it?

If so, that would mean I'm within the normal funding range, but I want to check because I don't want to be too optimistic!

**The number is: 2 R01 AI110964-06**

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

460 West 34<sup>th</sup> Street – 17<sup>th</sup> Floor

New York, NY 10001

Tel. [REDACTED] (b) (6)

Website: [www.ecohealthalliance.org](http://www.ecohealthalliance.org)

Twitter: [@PeterDaszak](https://twitter.com/PeterDaszak)

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**From:** [Peter Daszak](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Alison Andre](#); [Jon Epstein](#); [Kevin Olival](#)  
**Subject:** Talk at NIAID on Thursday  
**Date:** Monday, February 4, 2019 5:20:02 PM  
**Importance:** High

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Hi Erik,

Just wanted to let you know that we'll be giving a 9am Virology Branch brownbag at NIAID Rockville on Thursday this week. It was arranged by Jean Patterson who spoke with Jon Epstein here and we'll be talking about general issues around viral emergence and discovery. I'll be showcasing our SARS and SADS work of course....

I hope you'll be around and are able to come along?

Cheers,

Peter

**Peter Daszak**

*President*

EcoHealth Alliance

460 West 34<sup>th</sup> Street – 17<sup>th</sup> Floor

New York, NY 10001

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Twitter: [@PeterDaszak](#)

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**From:** [Aleksi Chmura](#)  
**To:** [Graham, Adam \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#); [李泓莹](#); [Peter Daszak](#)  
**Subject:** Re: IRB Question from Grant Number: 5R01AI110964 - 05 PI Name: DASZAK , PETER  
**Date:** Wednesday, October 10, 2018 3:32:02 PM

---

Dear Adam,

Understood and as we expected. We will keep you updated.

Many thanks for your response!

-Aleksi

**Aleksi Chmura, PhD**  
Chief of Staff

EcoHealth Alliance  
460 West 34th Street  
Ste. 1701  
New York, NY 10001

(b) (6) direct  
(b) (6) mobile  
Aleksi MacDurian (Skype)

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On Oct 10, 2018, at 08:04, Graham, Adam (NIH/NIAID) [E]  
(b) (6) wrote:

Hi Aleksi,

You would need to obtain an updated IRB approval from your institution and provide notification of that approval to us. We would not need the Chinese approval, as your IRB approval includes review of that.

Thanks,

**Adam Graham**

Grants Management Specialist  
DHHS, NIH, NIAID, GMP  
Room 4E40, MSC 9833  
5601 Fishers Lane  
Bethesda, MD 20892

(b) (6)

**Effective January 1, 2017**, NIH closeout policy has changed (see [NOT-OD-17-022](#)). NIH is no longer accepting Final Progress Reports (FPR). Grantees must now report final project outcomes using the new F-RPPR. For instructions on how to submit the new F-



RPPR please see instructions on the [NIH RPPR Page](#).

<image001.png>

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**From:** Aleksei Chmura (b) (6).  
**Sent:** Wednesday, October 3, 2018 9:46 AM  
**To:** Graham, Adam (NIH/NIAID) [E] (b) (6)  
**Cc:** Stemmy, Erik (NIH/NIAID) [E] (b) (6); 李泓莹  
(b) (6); Dr. Peter Daszak (b) (6)  
**Subject:** IRB Question from Grant Number: 5R01AI110964 - 05 PI Name: DASZAK , PETER

Dear Adam,

We have an online, anonymous survey we would like to conduct with individuals at the wildlife-domestic animal interface in southern China under our award. We are teasing out the different risk and motivating factors for Coronavirus and bat exposure as per our specific aim 2 in our proposal. The IRB of our Chinese/local partner the Wuhan School of Public Health has reviewed our proposed study and approved it. Both the Wuhan School of Public Health and EcoHealth Alliance (our institution) have active FWAs. This proposed online, anonymous survey is not part of our current, approved IRB protocol under our award.

Our understanding is that we will also need USA IRB approval (as we have had with all our other human research) and that having a China-only IRB approval will not be sufficient for our proposed online survey. We wanted to confirm with you before proceeding with a new US IRB approval. This will affect our participant enrollment numbers too. How would we proceed with this - just forward to you our US and China IRB approval notifications or is this done via [Research.gov](#)? If it will be easier, both Hongying Li and I are available for a phone call anytime tomorrow or Friday.

Many thanks,

-Aleksei

**Aleksei Chmura, PhD**  
Chief of Staff

EcoHealth Alliance  
460 West 34th Street  
Ste. 1701  
New York, NY 10001

(b) (6) (direct)  
(b) (6) (mobile)  
Aleksei MacDurian (Skype)

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Begin forwarded message:

From: "Graham, Adam (NIH/NIAID) [E]"

(b) (6)

Subject: Grant Number: 5R01AI110964 – 05 PI Name: DASZAK, PETER

Date: July 5, 2018 at 15:25:16 EDT

To: (b) (6)

, "Stemmy, Erik

(NIH/NIAID) [E]"

(b) (6)

(b) (6)

Cc: "Linde, Emily (NIH/NIAID) [E]"

(b) (6)

"Glowinski, Irene (NIH/NIAID)

[E]"

(b) (6)

"Erbelding, Emily

(NIH/NIAID) [E]"

(b) (6)

"Ford,

Andrew (NIH/NIAID) [E]"

(b) (6)

"Khurana,

Dhana (NIH/NIAID) [E]"

(b) (6)

Good afternoon,

Attached is a letter notifying you that the GoF Research Funding Pause has been lifted via the HHS P3CO Framework and that the GoF term-of-award was removed when the next last Type 5 notice-of-award was issued.

Please let us know if you have any questions.

**Adam Graham**

Grants Management Specialist

DHHS, NIH, NIAID, GMP

Room 4E40, MSC 9833

5601 Fishers Lane

Bethesda, MD 20892

(b) (6)

**Effective January 1, 2017, NIH closeout policy has changed (see [NOT-OD-17-022](#)). NIH is no longer accepting Final Progress Reports (FPR). Grantees must now report final project outcomes using the new F-RPPR. For instructions on how to submit the new F-RPPR please see instructions on the [NIH RPPR Page](#).**

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**From:** [Hongying Li](#)  
**To:** [Stemmy, Erik \(NIH/NIAID\) \[E\]](#)  
**Cc:** [Aleksei Chmura](#)  
**Subject:** Re: Opportunity Number for R01 Proposal  
**Date:** Tuesday, October 9, 2018 8:04:00 AM

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Hi Erik,

Thank you very much for confirmation. We should be submitting soon!

Best,  
Hongying

On Oct 9, 2018, at 7:56 AM, Stemmy, Erik (NIH/NIAID) [E] (b) (6) wrote:

Hello Hongying,  
That's correct. You should apply for the renewal through the parent R01 mechanism.  
The PA you reference should be correct. When you submit, you can use either ASSIST  
or [grants.gov](http://grants.gov). There are links in the PA.  
Let me know if you have any other questions.

Best,

Erik

Erik J. Stemmy, Ph.D.

Program Officer

Respiratory Diseases Branch

Division of Microbiology and Infectious Diseases NIAID/NIH/HHS

5601 Fishers Lane, Room 8E18

Bethesda, MD 20892-9825

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**From:** Hongying Li (b) (6)

**Sent:** Thursday, October 04, 2018 4:45 PM

**To:** Stemmy, Erik (NIH/NIAID) [E] (b) (6)

**Cc:** Aleksei Chmura (b) (6)

**Subject:** Opportunity Number for R01 Proposal

Dear Erik,

We are submitting a NIAID renewal proposal soon, so just wanted to confirm with you about the opportunity number (we are currently looking at the PA-18-484), to make sure we have the correct one.

Also, am I correct I thinking that we may submit our proposal via either ASSIST or [Grants.gov](https://www.grants.gov/)?

Thanks,

Hongying

**Hongying Li, MPH 李泓莹**

*China Programs Coordinator*

[EcoHealth Alliance](#)

460 West 34th Street – 17th floor

New York, NY 10001

(b) (6) (U.S. mobile)

Hongying Li (Skype)

(b) (6) (WeChat)

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