Glyphosate: 4/5/16 meeting between EPA and Monsanto—notes

EPA met with Monsanto to discuss EPA's recent information request for glyphosate. In an email dated 3/21/16, EPA requested information on the inert ingredients used in popular US and European formulations of glyphosate in the present day and also dating back to the 80s. EPA was particularly interested in information on how glyphosate formulations have changed over time in the last 20-30 years. In its email request, EPA included a list of 6 epi studies that were completed in the mid-1980s to the early 2000s; these studies were cited in the IARC's recent report on glyphosate. EPA included this list of studies because it was interested in characterizing potential differences in US and European glyphosate epidemiology studies.

Monsanto briefly discussed the epi studies that were referenced in EPA's 3/21/16 email and discussed why they are not suitable to assess carcinogenicity of glyphosate. Monsanto also briefly discussed glyphosate's history of safety and the conclusions of various regulatory agencies all over the world, many of which conclude that glyphosate was not carcinogenic.

EPA stated that at this time it was not interested in discussing the opinions of other regulatory agencies nor was it interested in debating glyphosate's alleged carcinogenicity at the April 5 meeting. Rather, EPA stated that it was in the midst of a large scale holistic review of the glyphosate database. EPA's approach for registration review risk assessment is to take a systematic and scientific, weight of the evidence approach, and would not rely on the regulatory conclusions of other regulatory agencies. In an effort to resolve questions about the potential toxicity of glyphosate, glyphosate formulations, and any co-formulants (inert ingredients and surfactants), EPA was interested in any data or information Monsanto may have on how the formulations may differ from data on the active ingredient and surfactants independently of one another.

Of particular interest to EPA are the following:

1) Toxicity (particularly repeat dose data) or pharmacokinetic formulation studies.
2) Information on the pharmacokinetics of glyphosate, including info on tissue dosimetry or metabolism.
3) *In vitro* studies on bioactivity (including cellular-based bioactivity).
4) Any *in vitro* ADME (absorption, distribution, metabolism, and excretion) studies
5) Any remaining carcinogenicity studies on glyphosate not yet submitted to EPA. At some point in the future, the agency may be interested in other toxicities (*e.g.*, developmental or reproductive toxicity).

EPA requested that rather than sending to the agency all the studies that might be relevant, Monsanto should start with a bibliography that EPA can use to compare with its own bibliography. The agency requested that Monsanto include data generated for both North American registrations as well as European registrations. Then EPA would be able to indicate which of these studies would be of potential use in its analysis and make a request for them. EPA indicated that this should be done as soon as possible.

There was also some discussion about changes in Monsanto's Roundup formulation over the years. Monsanto indicated that up until 2000, nearly all glyphosate products on the market were its Roundup formulation which used some form of tallow amine as a surfactant. Afterwards, the properties of

surfactants used and the ratio of surfactant to active ingredient were changed in most formulations due to a need for increased ai loading. Current products vary geographically due to various reasons, some having to do with marketing. EPA suggested that Monsanto provide in writing any information that documents the changes of glyphosate formulations over time and across the globe.

The agency appreciates Monsanto's cooperation in its attempt to conduct a thorough and transparent science-driven analysis of the human health effects of glyphosate under registration review.