

G.E. Séralini, R. Mesnage, N. Defarge. (2013) Health effects of pesticides are overlooked in GMO risk assessments  
Comment #57505 in Nature on 491, 327 (2012).

## Biotechnology: Bring more rigour to GM research

By [François Houllier](#)<sup>1</sup>

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Peter Cary said:

On behalf of [Gilles-Eric Séralini](#):

Health effects of pesticides are overlooked in GMO risk assessments

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An international debate arose after we published the first long-term toxicological assessment of the whole Roundup pesticide formulation at environmentally relevant levels (from 0.1 ppb) and a Roundup-tolerant genetically modified (GM) maize (NK603)<sup>1</sup>. Our results challenge claims that these products are safe. The concern expressed by Francois Houllier (Nature 491)<sup>2</sup> that our results could damage public opinion about GM crops gives precedence to economic interests over public health.

Nevertheless, we agree that more rigour in GM research is needed. The usual way of commercializing

agricultural GMOs and formulated pesticides with short-term or no in vivo testing, as well as keeping raw data hidden for reasons of commercial confidentiality, is not scientifically rigorous. The first focus should be the toxicity of pesticide residues. Current regulatory assessment overlooks the fact that all GM crops are genetically modified to contain pesticide residues (mostly Roundup residues and Bt toxins) together with adjuvants. These pesticide residues are new elements in our diet, either in type or amount and are often not tested in vivo. We showed that Roundup (sprayed in 80% of GMOs) contains new toxic compounds, more toxic than glyphosate which is surprisingly tested alone for chronic effects 3. In order to take the debate forward, more data are needed. First, our experiment should be repeated. The outcome of the debate relies on the access by the scientific community to the raw data that allowed the commercialization of Roundup and NK603. Without this step, the debate cannot be on scientific issues. Our raw data<sup>1</sup> were already given to a notary, expecting comparisons. We have answered to all other criticisms<sup>4</sup>.

1 Séralini, G. E. et al. *Food Chem Toxicol* 50, 4221-4231 (2012).

2 Houllier, F. *Nature* 491, 327 (2012).

3 Mesnage, R. et al. *Toxicology*, doi:S0300-483X(12)00345-9 (2012).