

What's the right question to ask about GMOs?

April 27 2016, by Erin Zess

I would argue that the source of a transgene and its method of introduction are irrelevant to the safety of the resulting plant. A gene is a gene — it is a sequence of DNA and, as a molecule, DNA has [zero chance](#) of harming you. The DNA can be from any organism — literally, any organism — and it is still just a sequence of the same chemical letters, A, T, G, and C. Moreover, the method of transgene introduction, be it by plant breeding or by transformation, has no effect on the action of the gene product in the cell. Either the gene is present and active, or it is not.

What does matter to me, and what I find of critical concern, is how a transgene is read by the cell, what protein product it makes, how that protein acts in the cell, and how that action has consequences outside of the cell and, more generally, outside of the plant. I would argue that, when we debate [genetic modification](#), our debates should be centred on these points. And, crucially, that these debates should be different for each and every GMO. Every GMO has a different transgene or set of transgenes, and thus different protein products banging around the cell.

Considering this fact, "[Are GMOs safe?](#)" is an asinine question. I'm certain that if I made a GM plant that produced rat poison it would not be safe. However, if I made a GM plant that had a transgene to produce a protein from another plant, previous evidence would suggest that the resultant GMO is going to be harmless. Thus, sweeping generalizations about the safety of GMOs, whether #AntiGMO or #ProGM in their flavour, are insufficient and irresponsible. We need to ask more

informative questions and, through this line of inquiry, start a new conversation about GMOs that reflects the complexity of the topic.

Rather than, "Are GMOs bad?" we should ask a series of questions for each and every GM product: What is the cellular function of the transgene protein product? How does this [cellular function](#) affect the traits of the transgenic plant? Are there negative consequences — for humans, wildlife, or ecological systems — of these plant traits? Moreover, are there negative downstream effects of the way that this GMO will be used in agriculture? Lastly, do all of the negatives outweigh all of the benefits of using this GMO in agriculture?

These are the questions that regulatory agencies ([U.S.](#), [Europe](#)) already ask in order to allow GM products on the market — but these are the questions that consumers need to ask, too. Moreover, industry scientists, academics, and government agencies need to be up to the task of answering these questions transparently and in understandable terms. The results of safety testing should be clearly communicated so that when a GMO is deemed 'safe,' consumers aren't left wondering what 'safe' means.

Rather than a climate of 'hush, hush, trust' this shift would foster an environment of 'ask, ask, understand,' — not as punchy to say, but far more powerful. If consumers are able to recognize the primacy of these questions and access digestible information that satiated their inquisitive appetites, the GM debate as we know it would cease to exist.

In place of garbage questions, oversimplified hashtags, and jargon-filled scientific placations, we'd be able to have a genuine, well-informed discussion about GM technology and the resulting GMOs.

In the context of plant science, genetic modification (GM) technology is the introduction of transgenes into non-native host plant via

biotechnology methods. With this now-understandable definition — which has plagued you throughout — I hope that when we talk about genetic modification, we talk about the technology and [the safety of the products](#), leaving the oft-conflated issues (food security, industrial agriculture, Monsanto's policies) for another conversation.

When we talk about genetic modification technology and the safety of the products, I hope that we also talk about the [myriad of products](#) and the diversity of GMOs. I hope that we forgo sweeping generalizations and, instead, opt to ask more [nuanced questions](#) and seek accurate answers. With clarity, we can break out of the current circular, unproductive argument and really talk about genetic modification when we talk about 'genetic modification.'

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