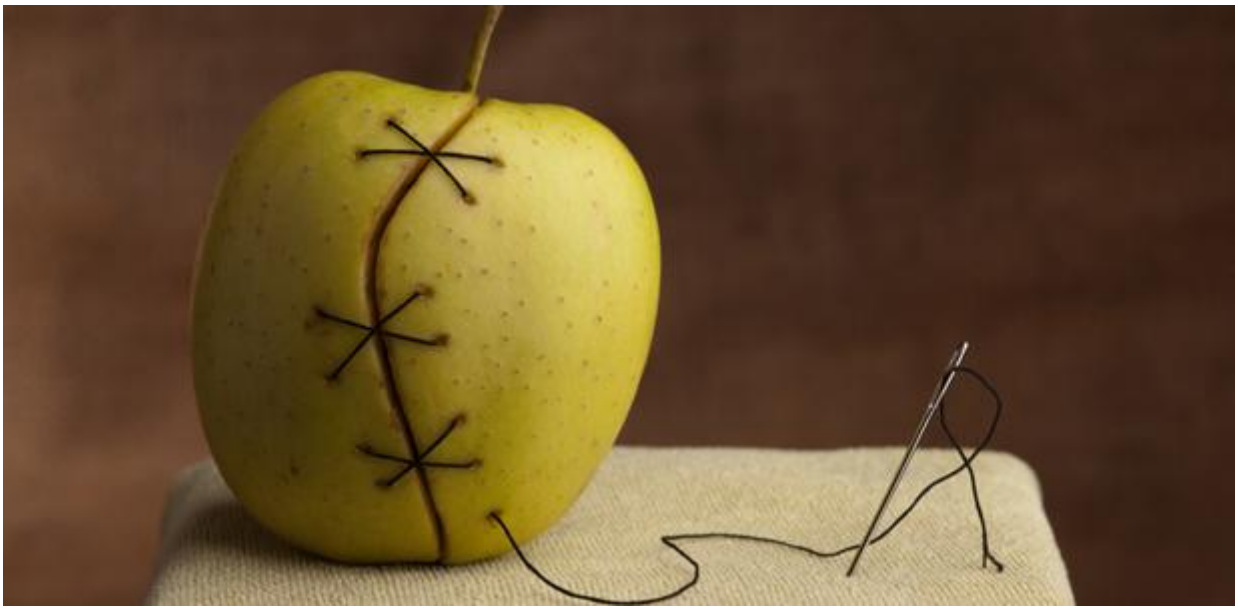
The Very Real Danger of Genetically Modified Foods

By Ari LeVaux

Jan 9 2012, 7:57 AM ET286

New research shows that when we eat we're consuming more than just vitamins and protein. Our bodies are absorbing information, or microRNA.



Chinese researchers have found small pieces of ribonucleic acid (RNA) in the blood and organs of humans who eat rice. The Nanjing University-based team showed that this genetic material will bind to proteins in human liver cells and influence the uptake of cholesterol from the blood.

The type of RNA in question is called microRNA, due to its small size. MicroRNAs have been studied extensively since their discovery ten years ago, and have been linked to human diseases including cancer, Alzheimer's, and diabetes. The Chinese research provides the first example of ingested plant microRNA surviving digestion and influencing human cell function.

Should the research survive scientific scrutiny, it could prove a game changer in many fields. It would mean that we're eating not just vitamins, protein, and fuel, but information as well.

The Chinese RNA study threatens to blast a major hole in Monsanto's claim. It means that DNA can code for microRNA, which can, in fact, be hazardous.

That knowledge could deepen our understanding of cross-species communication, co-evolution, and predator-prey relationships. It could illuminate new mechanisms for some metabolic disorders and perhaps explain how some herbal medicines function. And it reveals a pathway by which genetically modified (GM) foods might influence human health.

Monsanto's website states, "There is no need for, or value in testing the safety of GM foods in humans." This viewpoint, while good for business, is built on an understanding of genetics circa 1950. It follows what's called the "Central Dogma" (PDF) of genetics, which postulates a one-way chain of command between DNA and the cells DNA governs.

The Central Dogma resembles the process of ordering a pizza. The DNA knows what kind of pizza it wants, and orders it. The RNA is the order slip, which communicates the specifics of the pizza to the cook. The finished and delivered pizza is analogous to the protein that DNA codes for.

We've known for years that the Central Dogma, though basically correct, is overly simplistic. For example: Pieces of microRNA that don't code for anything, pizza or otherwise, can travel among cells and influence their activities in many other ways. So while the DNA is ordering pizza, it's also bombarding the pizzeria with unrelated RNA messages that can cancel a cheese delivery, pay the dishwasher nine million dollars, or email the secret sauce recipe to WikiLeaks.

Monsanto's claim that human toxicology tests are unwarranted is based on the doctrine of "substantial equivalence." This term is used around the world as the basis of regulations designed to facilitate the rapid commercialization of genetically engineered foods, by sparing them from extensive safety testing.

According to substantial equivalence, comparisons between GM and non-GM crops need only investigate the end products of DNA translation: the pizza, as it were. "There is no need to test the safety of DNA introduced into GM crops. DNA (and resulting RNA) is present in almost all foods," Monsanto's website reads. "DNA is non-toxic and the presence of DNA, in and of itself, presents no hazard."

The Chinese RNA study threatens to blast a major hole in that claim. It means that DNA can code for microRNA, which can, in fact, be hazardous.

"So long as the introduced protein is determined to be safe, food from GM crops determined to be substantially equivalent is not expected to pose any health risks," Monsanto's website goes on. In other words, as long as the pizza is OK, the introduced DNA doesn't pose a problem.

Chen-Yu Zhang, the lead researcher on the Chinese RNA study, has made no comment regarding the implications of his work for the debate over the safety of GM food. Nonetheless, his discoveries give shape to concerns about substantial equivalence that have been raised for years.

In 1999, a group of scientists wrote a now-landmark letter titled "Beyond Substantial Equivalence" to the prestigious journal Nature. In the letter, Erik Millstone et. al. called substantial equivalence "a

pseudo-scientific concept" that is "inherently anti-scientific because it was created primarily to provide an excuse for not requiring biochemical or toxicological tests."

To these charges, Monsanto responded: "The concept of substantial equivalence was elaborated by international scientific and regulatory experts convened by the Organization for Economic Co-operation and Development (OECD) in 1991, well before any biotechnology products were ready for market.

This response is less a rebuttal than a testimonial to Monsanto's marketing prowess. Establishing the concept of substantial equivalence worldwide was a prerequisite to the global commercialization of GM crops. It created a legal framework for selling GM foods anywhere in the world that substantial equivalence was accepted. By the time substantial equivalence was adopted, Monsanto had already developed numerous GM crops and was actively grooming them for market.

The OECD's 34 member nations could be described as largely rich, white, developed, and sympathetic to big business. The group's current mission is to spread economic development to the rest of the world. And while that mission has yet to be accomplished, OECD has helped Monsanto spread substantial equivalence to the rest of the world, selling a lot of GM seed along the way.

The news that we're ingesting information as well as physical material should force the biotech industry to confront the possibility that new DNA can have dangerous implications far beyond the products it codes for. Can we count on the biotech industry to accept the notion that more testing is necessary? Not if such action is perceived as a threat to the bottom line.

Image: Dirk Ercken/Shutterstock.

Extensive Debate below, downloaded January 11, 23.14 MEZ

zoemetrouk 2 days agoin reply to discussnick

Speculative and reactionary-- I would rather error on the side of caution. All I ask for is my food to be labeled--I don't want to eat GM foods and I want a big label that makes my life easy. Fruits, vegetables and animal products are clearly labeled "conventional" and "organic." They have the same DNA.

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85 people liked this. Like ReplyReply

grifty 2 days agoin reply to zoemetrouk

Working in agricultural regulation...you'd be surprised not only how little those labels mean, but also how infrequently they are correct.

Flag

41 people liked this. Like ReplyReply

Jason 1 day agoin reply to zoemetrouk

Actually no they don't have the same DNA. All crops have often 100s of different cultivars. Each of these will have been bred via different technologies - eg mutagenesis, marker-assisted selection, embryo rescue, hybridisation, etc. These are conventional breeding methods that can scramble or mix and match DNA is weird and unpredictable ways to produce novel traits in crops. Those with useful traits become the next cultivar marketed and grown by conventional and organic farming methods alike.
Jason Major, Manager TechNyou, University of Melbourne

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25 people liked this. Like ReplyReply

Maurine Tiedeman 1 day agoin reply to zoemetrouk

I AGREE 100% I want my food to be labeled. That is why I use the line Wildtree for the majority of our cooking and pantry staples. You can learn more here. US company that produces GMO free foods. http://www.mywildtree.com/MoT/

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11 people liked this. Like ReplyReply

Alex Kratochvil 15 hours agoin reply to Maurine Tiedeman

if you have ever eaten an apple you are eating gentically controlled food

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3 people liked this. Like ReplyReply

George Shute 13 hours agoin reply to Alex Kratochvil

I don't think selective breeding is the issue here. Comparing an apple to GM foods is, well, apples and oranges.

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AtlanticMM 1 hour agoin reply to George Shute

Mmm, not really. Both are based upon DNA mutations that have occurred.

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Jacob Lee Bane 39 minutes agoin reply to AtlanticMM

But whereas organic apples and non-GMO are selected over a period of decades, GM food is spliced with viruses including Ebola. Not sure I like the idea of consuming that.

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1 person liked this. Like ReplyReply

redjujube 1 day agoin reply to discussnick

Learn to read, discussnick. Nowhere in the article does the author state or even imply that genetically modified food definitely causes metabolic disorders. The author does say it's a possibility and questions the notion of substantial equivalence.

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30 people liked this. Like ReplyReply

molten_tofu 1 day agoin reply to redjujube

redjujube seems to me that if the author states it's a possibility, we're already well past "implied" on the suggesting-something scale. Sorry, it just seems like you're being parsimonious here.

Further, if the author were to not try at least in some way to link the issues of using substantial equivalence as a justification for GMOs to the bigger threat of micro RNA run amok, he would lose

basically all of his non-academic impacts. I'm not a fan of significance based topicality, but if the author really says what you say he says, this article is basically toothless.

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4 people liked this. Like ReplyReply

redjujube 17 hours agoin reply to molten_tofu

You are using the word imply in a different sense than I do, I think. Leaping from a 10th floor window (without some form of protection or "parachute" type of device) and lading on pavement causes injury. If I say John leaped from his 10th floor apartment window then I have implied he is now injured. I say, by implication, he is definitely injured without really using those words. That's what an implication is, it's not a suggestion somewhere on a scale of suggestion-something, it is equivalent to a statement.

I still claim that the author did not state or even imply that GMOs definitely cause metabolic disorders. How could he? Even the scientists and the studies he mentions have not stated GMOs definitely cause genetic disorders. There are links, there are suggestions that it does, the links are being investigated but thers is no proof yet. He presents some ideas about how GMOs *might* cause genetic disorders but nowhere does he say there is compelling proof or even strong proof or even a little proof. And he points to the problems with substantial equivalence. That's it, that's all.

You think I'm parsimonious? I think you're reading too much into what the author says. And yes the article is toothless. Even the title is toothless. Suppose I write an article titled "The Very Real Dangers of Nuclear War ", does that mean nuclear war is happening? Not necessarily. The title is what it is, the "dangers" of GMOs in other words the bad things that *might* happen. Putting "real" in front of "danger" doesn't mean the dangerous thing(s) are happening, it just means it's a genuine possibility.

The bottom line is the author is discussing ideas and possibilities rather than presenting proof because there is not proof, yet, just some well founded hypotheses that deserve further research and apparently are being researched. If that means the article is toothless then OK the article is toothless. Must it be anything more? Is it necessary for it to be a scathing indictment of Monsanto? For those who would convict Monsanto before there is proof then yes, any and all articles must be an indictment and they'll read whatever they want into the article to turn it into an indictment. I think that's insanity, even a**holiness, and I refuse to be a part of it.

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5 people liked this. Like ReplyReply

molten_tofu 16 hours agoin reply to redjujube

The argument I see this article making is: by failing to account for the incidental impacts of artificially introduced DNA / microRNA, we are leaving humanity open to the possibility of systemic threats (cancer, disease, etc). The source of artificially introduced DNA / microRNA referred to most prominently in the article is GMOs.

In other words, as long as building nukes doesn't increase the chances of nuclear war, we'll be fine...

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OccupyPsyche 19 hours agoin reply to discussnick

It's odd how you find this article questionable and are so dissecting ..yet did not balk at the fact that Monsanto just sweeps any discussion of testing under the carpet.
Food codes are very strict..why should this not undergo scrutiny? Be labeled? Be tested? Be held liable for cross pollinated/destroyed heirloom and/or organic crops ?

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16 people liked this. Like ReplyReply

redjujube 16 hours agoin reply to OccupyPsyche

I don't find the article questionable. I agree with everything it says. Where did I say otherwise? And I DO balk at the fact that Monsanto doesn't want further testing. I am all for further testing, I *demand* further testing, there will be further testing whether Monsanto likes it or not. They have a say in the matter but that's all they have...words. We, the people, will scrutinize what *we* want, not what big business wants and they will learn to like it or they can take a hike. You think food codes are strict? I want them even stricter. I am all for legislating better labeling and testing and I think there can never be too much scrutiny when there are huge profits and huge health risks at stake. There should be scrutinizers whose only job is to think of better ways and more issues to scrutinize, that's how strongly I believe in scrutiny and I do not believe in letting big businesses scrutinize themselves. They've proven they (most?) refuse to do it properly and they lie and cheat and cover up crap so they can earn more profits. I'm not sure sure what you're saying about liability so I'll reserve specific comments on that and just say it could apply in Monsanto's case.

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5 people liked this. Like ReplyReply

Natural Grocers 5 hours agoin reply to OccupyPsyche

To answer your question about WHY, here is a quick chart showing how Monsanto manipulated the system for its own ends. http://bit.ly/nmjHBY Monsanto is not the first to do so...

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4 people liked this. Like ReplyReply

cowormman 4 hours agoin reply to Natural Grocers

Actually to all involved in this belated discussion. 30years! Dogma doesn't belong in science. Precaution does. These people are Trans-species Rapist's and as they continue down the path of Agriculture as another Dogma where choices are made by bottom line calculations we will continue to bare the consequences of their offspring. That is an easily recognizable pattern to which we all are subject to.

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3 people liked this. Like ReplyReply

George Shute 13 hours agoin reply to discussnick

"Ergo genetically modified food definitely causes metabolic disorders."

That was never said anywhere in the piece. Straw man much?

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Physiologyprof 2 hours agoin reply to discussnick

Thank you. Logic - as my husband keeps telling me - I just don't understand how few people use logic as a basis for decisions.
98.5% of our DNA does not code for proteins. This DNA is not what we normally call a gene. Some / lots (?) of this DNA codes for micro RNAs. We received much of this DNA from viruses - and viruses that infected our ancestors ancestors. Many micro RNAs are important regulators that prevent some DNA sequences from being expressed as proteins. We are study micro RNAs intensely, and will have more answers about their functions. The DNA placed into GMO's is the sequence that codes for the desired protein. The "genes" selected by ordinary plant selection and breeding come with lots of

other DNA - including DNA that codes for micro RNAs, and for other genes. With ordinary selection we select only by visible traits. It may be logical to suggest that we get more micro RNAs ("good or bad") from strains breed by ordinary methods than we do from GMO's.

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Joseph Kaye 2 days ago

Frankly, I would think the more natural reaction would be to start with a fairly immense distrust of genetically modified foods and then build a case to start thinking they're OK. We seem to have done the reverse.

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DavidBN 2 days agoin reply to Joseph Kaye

Why? Do you start with a healthy mistrust of food plants bread through conventional methods, which contain undesigned genetic mutations, excess chromosomes, or are the product of cross-species polination? Should everything in the Seed Savers catalog be vetted through extensive health studies? Is this even remotely possible?

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anononodon 2 days agoin reply to DavidBN

Clearly you don't understand that the modifications made by Monsanto to plants we ingest are modifications that could have NEVER have happened naturally. It's like combining a tree and a human .

But no of course you don't, like many people, you believe if you just stick your head in the sand everything will be ok.

They have a name for those people, they are called SUCKERS.

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73 people liked this. Like ReplyReply

grifty 2 days agoin reply to anononodon

He actually has a reasonable point. What is the real difference between a GMO and a non-GMO? Sure..a naturally occurring bacterium's genes being added to corn (Bt) isn't going to happen on its own..but does that automatically make it a bad thing? Your appendix isn't going to get removed naturally either..but it getting removed might be good for you.
The plants we recognize and eat today are very different than their ancestors as a result of domestication. Over time, we've (collectively) modified the genetics of these plants by crossbreeding, selection as well as uncontrolled mutation. The real difference between that and what is done with a modern GMO is a matter of specificity.
I think people on both sides of this argument have irrational ideas. Is there any concrete evidence (feelings are irrelevant in this instance) that GMOs are dangerous? If so, that evidence needs to be followed as far as possible. Any investigation needs to be done independently of the companies who profit from the production..but it also can't be done with the agenda of "proving" GMOs are unsafe.

I think the take away here is that people need to learn how to evaluate the source of a claim. Of course Monstanto is going to claim BT corn is safe. Of course seedsofdeception.com is going to claim that GMOs are dangerous.
Don't forget there is quite a bit of anecdotal evidence that GMO crops are safe for human consumption. They're pretty well distributed throughout the markets of the world.

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76 people liked this. Like ReplyReply

Luke__Skywalker 2 days agoin reply to grifty

Well said, thanks for being rational. People on both sides of this argument can be ridiculous.

I just wanted to add though that the issue goes a little bit beyond health. I'm not going to pretend to be an expert in the field, but there are potential environmental concerns and definitely political issues involved. I saw a documentary that interviewed a farmer who was sued by Monsanto because the patented Monsanto crop had been growing on his land, which allegedly had blown over from another farmer's land. If this is true (the documentary was called "The Corporation", a pretty famous one and I believe reliable) you can see how this could be an issue of biodiversity.

I also read an article which basically argued that the US will subsidize farmers who can then produce more crops and a lower cost. It creates a surplus which can then be "dumped" into foreign markets (I think Mexico was an example) where it is then sold at a lower cost than the domestic prices within these foreign nations. Native farmers can't compete with the lower prices, and are driven out of business. GM crops play a big role in the ability to mass produce. That's just a summary of the article (sadly I don't have a reference to it, but I read it for a class on globalization at the University of

Illinois)

Again, I'm not an expert, I just wanted to illustrate that GM foods impact a wide range of fields, from health to politics.

Flag

34 people liked this. Like ReplyReply

grifty 2 days agoin reply to Luke__Skywalker

I read an article to that effect too. In the same article (Honolulu Weekly), they also said that a farmer in Canada had sued Monstanto for contaminating his crops with their GMO pollen. I'm quite curious to see how that will turn out. I find stuff like that to be highly concerning..the burden to control the GMO products needs to be on the people who are growing them.

The environmental issue is separate from human health, but equally important. Regardless about how we all feel about it, corn, soy and rice crops are critical to our (humanity) current way of life. Without question we need to proceed carefully when doing anything to these crops...the loss of any of the three would be devastating.

I've also heard about the GMO seed issue..that is terrible. I've also heard that native farmers are given sterile GMO seeds..so they have to keep growing the GMO crop or come up with a new seed source..that sounds pretty predatory.

One thing I always find troublesome is the inability to separate politics and science from business interests. While I realize that we always need to make value judgments, they should be clear and well informed...rather than influenced by how profitable the decision is.

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30 people liked this. Like ReplyReply

DavidBN 2 days agoin reply to grifty

I've also heard about the GMO seed issue..that is terrible. I've also heard that native farmers are given sterile GMO seeds..so they have to keep growing the GMO crop or come up with a new seed source..that sounds pretty predatory.

Think about that for a second. Growing sterile seeds.

Now, people may be given food corn that's been sterilized, but that's a different story.

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gulfkraken 2 days agoin reply to DavidBN

I am curious as to how sterile seeds prevent a farmer from buying more seed next year.

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2 people liked this. Like ReplyReply

grifty 1 day agoin reply to gulfkraken

Most farmers just generate their own seeds from season to season.

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gulfkraken 1 day agoin reply to grifty

No they don't. I grew up in the Midwest, on a farm. No farmer keeps seed from season to season. Probably has something to do with alternating crops year over year. You know, seed doesn't keep for years on end in a storage bin through the heat, the cold, the damp, the bugs, and the mold. Not to mention the cost of overheard on the bin and the wasted storage space. Seed salesmen do big business and their parent companies make a mint.

(Edited by author 1 day ago)

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14 people liked this. Like ReplyReply

disqusplaya 1 day agoin reply to gulfkraken

I think you have a false assumption that "most" farmers are in the midwest, or the United States, or North America, or westernized civilizations. I'd wager you are wrong about that assumption.

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21 people liked this. Like ReplyReply

grifty 1 day agoin reply to gulfkraken

In tropical climates, where the growing season is year round, things are done differently.

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12 people liked this. Like ReplyReply

Dancing Creek Farm 1 day agoin reply to gulfkraken

Perhaps SOME farmers today but for centuries farmers have saved seed to continue their crops.
Today thanks to GMO seeds this is not possible.

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24 people liked this. Like ReplyReply

DavidBN 1 day agoin reply to gulfkraken

It hasn't been common for farmers in the developed world to save seeds from the last season since hybrid varieties were developed in the early 20th century.

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7 people liked this. Like ReplyReply

Jason 1 day agoin reply to gulfkraken

Also, most likely if it is a crop like corn they will be hybrid cultivars which have declining yields with each subsequent generation. The hybrid breeding process produces what is known as hybrid vigour leading to a high yielding crop, but only for one generation. It is not worth a farmer saving any seed for the following year. But the yield on the first crop makes it worthwhile - in theory.
Jason Major, TechNyou, University of Melbourne

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12 people liked this. Like ReplyReply

OccupyPsyche 18 hours agoin reply to Jason

But for those who raise heirloom seed...the seed is the crop!!

Flag

8 people liked this. Like ReplyReply

OccupyPsyche 18 hours agoin reply to gulfkraken

Many of the farmers I know in Oregon kept seed from the crop they grow for the next years plantings, or sell it as another cash crop to another farmer who may want to grow it.

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3 people liked this. Like ReplyReply

Leslie Ann Diffin 1 day agoin reply to grifty

You are mistaken. Some of are fortunate to harvest and 'heirloom our seeds. Farming on a scale to be considered such, it is not a viable option. A little under exposed to food production grifty?

Flag

4 people liked this. Like ReplyReply

George Shute 12 hours agoin reply to grifty

Even if you wanted to, you can't. Making your own seeds is a violation of contract and you can be brought to civil court. Saving seeds is also a violation. Distributing these seeds is a violation.

Some GM foods are rendered unable to produce viable seeds when pollinated and bred.

I highly suggest watching Food Inc. to see how these GM seeds work in the farming community.

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3 people liked this. Like ReplyReply

grifty 4 hours agoin reply to George Shute

non gmo seeds

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1 person liked this. Like ReplyReply

gem_s 1 day agoin reply to gulfkraken

It's that plants don't produce viable seed, or plants that are patented that cause farmers to have to buy new seed or licenses every year. When farmers grow open-pollinated crops, they can save some of that crop's seeds and plant them again the following year. With certain hybrid crops, the plants do not produce viable seed, so the farmer must make enough money selling their crops to buy seed the following year. If your crop or the market is poor, you don't buy seed, and you can't use any of what you grew.

If it is patented seed, as Monsanto's is, even if it is viable farmers must pay to grow it again. This is why Monsanto goes after crops pollinated by their patented plants, even if the farmer didn't want that pollen blowing over. They've got to protect their patent, and they can recognize the DNA by genetic testing.

(Edited by author 1 day ago)

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14 people liked this. Like ReplyReply

gulfkraken 1 day agoin reply to gem_s

Gem: That is the point of David's joke: sterile seeds don't grow. Obviously grifty doesn't know what he is talking about. Much like the author having no idea as to what he is talking about.

Grifty states that " I've also heard that native farmers are given sterile GMO seeds..so they have to keep growing the GMO crop or come up with a new seed source." How does a seed that can't grow force somebody to use that seed again next year, when it never could have grown in first year. Again, Grifty is clueless.

Also, if you read Grifty's point, he says that a farmer sued Monstanto for cross pollination, not the other way around. I understand why Monsanto tried to use the Terminator gene system, because I understand intellectual property. A company can't give something away for perpetual use for a one time fee.

Flag

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Shelley Belton 1 day agoin reply to gulfkraken

Well, "sterile" was not the correct term, but he does have the general idea. Seeds from hybrid plants ARE NOT reliable. They are either sterile (do not grow at all); grow foliage and no flowers(fruits); or, if they do flower and even fruit, they will not be the same hybrid fruit as seen in the previous season... they will revert back to one of the parents that created the hybrid, and even then it will most likely be very little yield.

I am just a home gardener in my fourth year now, but I still purchase hybrid seeds while I continue to research about healthy organic practices concerning pests and disease. This year I will be trying my hand at some heirloom varieties and attempt to ween myself from hybrids.

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6 people liked this. Like ReplyReply

Gregg Mcphedrain 1 day agoin reply to gulfkraken

they used to be able to get their own seed from their own crops -

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4 people liked this. Like ReplyReply

Ken Metal 1 day agoin reply to grifty

Sadly, every decision made by big business is based upon the bottom line rather than the common good. Until this mentality changes, we are doomed to endure that which will benefit commercial interests.

Flag

9 people liked this. Like ReplyReply

Jason 1 day agoin reply to Luke__Skywalker

This now becomes an issue of how the technology or scientific knowledge is used, rather than an issue with the technology itself.
Second, there is no such thing as sterile seeds - ie the terminator seeds the people keep referring to. Producing such seeds is part of active research programs in various research labs worldwide (industry

and public institutions), but no commercial GM seeds have the terminator trait. There are also many reasons to produce such seeds. From the nefarious reason of protecting one's intellectual property to protecting cross pollination of the GM crop with, for example, native species - something that would be important for traits such as drought/salinity/frost tolerance.
Finally, as loathe as I am to defend Monsanto, and as much as I personally have an issue with the whole suing people for illegally growing your crop, the point is Monsanto must prove in a court of law that a farmer has intentionally and illegally planted their seed. A few seeds washed in from a road, or some wind-blown pollination events from a neighboring farm will not produce the amount of contamination that will allow Monsanto to win a case in the courts. The science is pretty sound on how much contamination will occur from all these event - this is independant, peer-reviewed science by the way. Mind you Monsanto will sue the pants off you if you actually have knowingly and illegally planted their seed without a contract. Again, this becomes a values-based assessment of how the technology is used.
Jason Major, Manager, TechNyou, University of Melbourne

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6 people liked this. Like ReplyReply

semidemens 1 day agoin reply to Jason

The farmer still has to defend himself in court. With expensive attorneys. Against an opponent with much deeper pockets.

The farmer isn't going to win.

Flag

8 people liked this. Like ReplyReply

Jason 23 hours agoin reply to semidemens

A job for someone. Work out how many farmers around the world are growing Monsanto-owned crops And find out how many many farmers have been sued. I personally don't have that information. Last time I spoke to a Monsanto PR person (about 3 years ago) he said there had been a total of about 270 cases go to court over illegal growing of their crop or breach of contract. You may think that is fair or not. It is not for me to say. I do know in Australia Monsanto is having nothing to do with the few high profile cases of farmers paddocks (fields) being contaminated by a neighbour's GM canola crop, simply because the contamination was unintentional (floods in one case). But semidemens has a point, a small farmer is hardly going to have the cash to defend themselves in court, but if he or she is guilty then they have only themselves to blame. If not then it is still not an indictment on the technology, only on Monsanto or whichever company is suing them simply becasue they have the lawyers and cash to do so, but personally, if I was Monsanto I wouldn't bother

spending tens of thousands of $$ on overpaid lawyers to take a farmer to court for a few thousand $$ because you suspect they might be breaching contract. I would want to be sure I was on legally sound ground before I went to all that effort. But then I am a science communicator, not a lawyer or businessman and I am stepping outside my area of expertise here.
Jason, TechNyou, University of Melbourne

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7 people liked this. Like ReplyReply

OccupyPsyche 18 hours agoin reply to semidemens

That is a very important point.. and for myself if I were to get a cross breeding my crop which IS the seed ...my vintage strain would be lost unless I saved a clean copy as it were. And as you pointed out seeds do not last for ever.

Flag

2 people liked this. Like ReplyReply

dodanimal 1 day agoin reply to grifty

Here is your answer: genetic engineering can cause changes in metabolism that are much more extreme than mere cross breeding. This is because genetic engineering depends on DNA expression promoters and the introduction of completely novel proteins into organisms that have never produced them before.

The promoter sequences can stimulate the production of novel proteins different from those intended (e.g. BT). These proteins could have enzymatic activity that produces toxic chemicals or peptides. Also, the intended proteins could have harmful enzymatic activity as well.

In view of these facts, it is outrageous and irresponsible to argue that GMOs are safe for everyone in the population to consume in large quantities for a lifetime.

The "substantial equivalence" notion is a HYPOTHESIS that has never been tested.

Flag

15 people liked this. Like ReplyReply

AtlanticMM 45 minutes agoin reply to dodanimal

Again, a bad leap. You cannot use words like "intended" because there is no real intention of nature or implication that this intention is good (whatever good means). Nature happens, mutations happen.

If anything, I would say the assumption should go the OTHER way. What possible scientific reasons exists that ever-so-slightly modified DNA would have any type of negative effect vs. it's 'natural' counterpart?

Heck, we keep going back on forth over what natural foods and such are cancer-causing for years and years. Until you get a large number of captive humans, isolated and studies for generations under closed conditions, you are not going to be able to DO such a study.

Flag

Like ReplyReply

dodanimal 20 minutes agoin reply to AtlanticMM

I used the word "intended" appropriately. In BT corn or BT soybeans, the intention is to introduce the BT protein. Hence, the BT protein is the protein intended to be introduced.

DNA promoter sequences (in random locations, and in random numbers) and DNA sequences coding for kingdom-crossing proteins can hardly be described as "ever-so-slightly modified DNA".

A study of GMOs on humans is impossible.

What is possible is studying the effects on animals. Some of the GMO feeding studies that have been done on animals showed clear evidence of harm.

What is completely outrageous with this issue is that the FDA doesnt require any safety testing whatsoever.

Like I said, the notion of "Substantial equivalence" is a scientific hypothesis that has never been tested, but is assumed by the FDA to be true. Thats a horrible, irresponsible way to make public policy. Its policy-by-assumption.

Flag

Like ReplyReply

rapier1 36 minutes agoin reply to dodanimal

The word *can* is important here. Just as you say the substantial equivalence concept is a hypothesis so is the idea that GMO foods can cause metabolic disorder. This idea has never been demonstrated. I'm not saying GMO is great but if you are going to use science to demolish an opponents argument you should apply the same standards to your own.

Flag

Like ReplyReply

dodanimal 26 minutes agoin reply to rapier1

Your argument is a bad one because foods introduced to the food supply should be proven safe BEFORE they are introduced, not the other way around. The sellers of GMOs must bear the burden of proof of safety; the opponents do not bear the same burden to prove harm. Ever heard of the "precautionary principle'?

Further, GMOs are forced on people, because they are unlabeled and contaminate even non-GMO crops. This is another reason why the burden to prove safety must apply to the GMO sellers.

Hence, your statements are a LOGIC FAIL.

I know there is only a limited amount of science available on the safety of GMOs. That's a result of the politics here. Big ag corporations dont have anything to gain from investigating possible risks.

The lack of science is a reason to be concerned about GMOs, not a reason to be confident.

So the basic concept here is that its NOT appropriate to apply the same (symmetrical) standards of scientific evidence to both sides here.

Flag

Like ReplyReply

LAURA KIMBERLY MERRICK 1 day agoin reply to grifty

Just because something is distributed and sold worldwide doesn't make it good. It means it's available for better or for worse.

Whether GMO crops are good or bad to eat is besides the point. They are entirely unnecessary and are killing the soil. They are very bad in the long run for our food supply as a whole.

Growing giant areas of monocrops is rapidly destroying what little topsoil is left, and possibly within 50 years there will not be enough left to farm on. With better farming practices, we can grow corn

and all the other crops we want on at least a third of the land it takes to produce all the food we waste right now. And these crops will naturally be resistant to pests due to the healthy soil and diversity of the crops among other reasons.

I'd rather not wait to find out that the GMOs are bad to eat, because I already know they are bad to grow for the future. They're not sustainable.

Flag

7 people liked this. Like ReplyReply

dom legras 23 hours agoin reply to LAURA KIMBERLY MERRICK

"they are unnecessary and killing the soil". How are they unnecessary? Do you know how many people starve to death each day? Their is simply no way in which we can feed the entire world with conventional agricultural tecniques, especially as the population continues to grow immensly in developing countries.

Growing giant areas of non GMO crops will have the exact same effect anyway. And i would like to know what these "better farming practices" are exactly.

Flag

1 person liked this. Like ReplyReply

OccupyPsyche 18 hours agoin reply to dom legras

It is much smarter to grow mixed crops, for many reasons. Smaller Mixed Tree Orchards that have beneficial weeds like dandelion, mixed herbs, and other cover crops between the rows. Need less water, fertilizer, and are easier to maintain. When you grow many types of trees and plants together you have less to harvest and process at one time harvests are spread out over the year and are more manageable for the farmer who these days cannot afford legal workers. In this way they have some thing to harvest every season so if one crop fails.. there are others to fill in the gaps.

Flag

3 people liked this. Like ReplyReply

grifty 19 hours agoin reply to LAURA KIMBERLY MERRICK

Laura..the issue you're bringing up is monoculture vs polyculture..a totally different argument. The sustainability issue is independent of GMOs...we've been doing monoculutres for quite some time

and it can (and is/has been) done without GMOs.
I'm on you're side on that point, but you not making a coherent argument for or against GMOs with the monoculture issue. If anything, you're building a case FOR GMOs, since some GMO products reduce the need for pesticide applications (corn that produces Bt for example).

Flag

Like ReplyReply

OccupyPsyche 18 hours agoin reply to grifty

But see it is connected...polyculture reduces need for pest control ..which is what GMO Round-Up ready was developed to live through being sprayed with. It lives,everything else dies. BT corn killed the pollinators..that was a real win.

Flag

3 people liked this. Like ReplyReply

grifty 4 hours agoin reply to OccupyPsyche

There is a huge range of GMO products. One of the most common is "bt corn", corn that produces its own bt toxin. BT is a soil bacterium that is poisonous to insects and is also applied to crops (its an organic pesticide). Bt corn doesn't need this pesticide applied.

So Roundup Ready is one variety. This is a plant that is resistant to the herbicide glyposate (Roundup and others). The other varieties simply produce their own pesticides.

Flag

1 person liked this. Like ReplyReply

rapier1 24 minutes agoin reply to LAURA KIMBERLY MERRICK

Unnecessary is really a matter of opinion. Let's say we grow a corn plant that can fix it's own nitrogen. Oh no! It's GMO! It must be bad! Well, if it can fix it's own nitrogen then the soil doesn't need to be amended with fertilizer. This means less nutrient rich run off into the watershed and a healthier watershed. This run off problem is true of organic as well as conventional crops. Like wise, Bt resistant corn means that farmers do not need to spray harmful pesticides to combat the corn weevil (which is a significant threat and organic producers also use pesticides to combat insects - they just use nicotine (a serious poinson, rotenone, sabadilla, and so forth)). RoundUp Ready crops allow farmers to avoid tilling to combat weeds (which releases CO2) or the use of other classes of

herbicides (RoundUp is actually pretty nontoxic for mammals but you still don't want to bathe in it).

Sure, you don't have to use these items and you can grow organically but that doesn't mean it will be better for the environment. It also generally means that you'll have decreased crop yield. This in turn leads to greater land usage which leads to increased water usage. Not good for aquifers. On the economic side it means higher prices which will exacerbate hunger issues throughout the world (and in America).

I'm not saying GMOs are the best thing since sliced bread. I am also not saying they should be grown everywhere. What we should do is look at *why* GMOs are used, what problems they are addressing, what problems they are creating and then making a clear, honest, and logical assessment about their role in agriculture.

Flag

Like ReplyReply

southernspy 1 day agoin reply to grifty

Just because something is distributed and sold worldwide doesn't make it good. It means it's available for better or for worse.
Whether GMO crops are good or bad to eat is besides the point. They are entirely unnecessary and are killing the soil. They are very bad in the long run for our food supply as a whole.
Growing giant areas of monocrops is rapidly destroying what little topsoil is left, and possibly within 50 years there will not be enough left to farm on. With better farming practices, we can grow corn and all the other crops we want on at least a third of the land it takes to produce all the food we waste right now. And these crops will naturally be resistant to pests due to the healthy soil and diversity of the crops among other reasons.
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Flag

2 people liked this. Like ReplyReply

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I'd rather not wait to find out that the GMOs are bad to eat, because I already know they are bad to grow for the future. They're not sustainable.

Flag

3 people liked this. Like ReplyReply

Gregg Mcphedrain 1 day agoin reply to grifty

Grifty
if monsantos goal wasn't to sue every farmer out of existence as they are trying to do when the Monsanto GM seed pollinates someone elses fieldby changing the food we eat - we ruin diversity which is needed for an ecosystem to survive- if monsanto followed the european business model - it has to be proven safe (not proven bad)
if monsanto wasn't lying about the data to suit their purpose - then you might have a point

Flag

4 people liked this. Like ReplyReply

OccupyPsyche 17 hours agoin reply to grifty

http://www.youtube.com/watch?v... these guys were in the industry...

Flag

1 person liked this. Like ReplyReply

George Shute 12 hours agoin reply to grifty

Funny thing; Africa would be decimated right now due to massive wheat shortages from the crops being susceptible to bacteria. GM wheat helped revive Africa's wheat production, staving off a massive food shortage that could have been catastrophic.

GM food needs to be closely looked at. Of course a corporation, especially one with such a deplorable track record as Monsanto, don't want nor feel the need to study the safety of the food.

That costs money and could ruin one of their products, if found unsafe. However, GM foods have done good things for the world at large and their potential benefits are undeniable.

Flag

1 person liked this. Like ReplyReply

Meredith Palmer 0 minutes agoin reply to grifty

Your appendix analogy does not stand. An appendix is removed when it has ruptured, and the patient will likely die without it. The plant will not die if you do not add foreign genes to it. Second, adding a gene is not the same as removing an organ. We have genes too. You cannot equate the two.

It is not a matter of mere "specificity" though I do like the difference to be specified. And I think the real problem is that people always wash over the problem of the social implications of the control of patented seeds by giant seed monopolies.

Flag

Like ReplyReply

DavidBN 2 days agoin reply to anononodon

Clearly you don't understand that the modifications made by Monsanto to plants we ingest are modifications that could have NEVER have happened naturally.

Really? Kind of like it's impossible for a single-celled organism to evolve into a blue whale naturally?

All (known) life on earth is essentially the same stuff, the same chemistry. It's all malleable and interchangeable. Nature knows no barriers; things like "species" or "kingdom" are human mental constructs. It's perfectly possible for organisms of radically different species to exchange DNA and viruses are notorious vectors for doing so.

The substance of this article, however, is concerned with the possible health risks of new genetic material. My point is that any process of breeding is going to create new/different genetic material. That's the point of breeding - you create a new genotype to create a new phenotype. Why would you think an unknown mutant gene that creates a bigger tomato is safer than a designed mutant gene that creates a bigger tomato?

But no of course you don't, like many people, you believe if you just stick your head in the sand everything will be ok.

Yes, I suppose I could be worried that every funny looking potato in my garden is a dangerously toxic

mutation, but part of being rational is sticking your head in the ground and not letting your life be consumed by worry over every trivial risk.

Flag

16 people liked this. Like ReplyReply

hshields 2 days agoin reply to DavidBN

Is Monsanto genetic modifications and experimentation posing a risk of uptake from soil and sludge and internalization in plants and vegetation of infectious human and animal prion proteins ? Over 7 million metric tons of sewage sludge containing prions is spread on home vegetable gardens and US crop and grazing lands each year. [uptake of pathogens and chemicals from sewage sludge fertilizer: http://www.sludgevictims.com/p...]

http://www.globalresearch.ca/i...
Monsanto Whistleblower Says Genetically Engineered Crops May Cause Disease

"In the summer of 1997, Kirk spoke with a Monsanto scientist who was doing some tests on Roundup Ready cotton. Using a “Western blot” analysis, the scientist was able to identify different proteins by their molecular weight. He told Kirk that the GM cotton not only contained the intended protein produced by the Roundup Ready gene, but also extra proteins that were not normally produced in the plant. These unknown proteins had been created during the gene insertion process."
"The scientist dismissed these newly created proteins in the cotton plant as unimportant background noise, but Kirk wasn’t convinced. Proteins can have allergenic or toxic properties, but no one at Monsanto had done a safety assessment on them. “I was afraid at that time that some of these proteins may be toxic.” He was particularly concerned that the rogue proteins “might possibly lead to mad cow or some other prion-type diseases.”When Kirk tried to share his concerns with the scientist, he realized, “He had no idea what I was talking about; he had not even heard of prions. And this was at a time when Europe had a great concern about mad cow disease and it was just before the Nobel prize was won by Stanley Prusiner for his discovery of prion proteins.” Kirk said “These Monsanto scientists are very knowledge about traditional products, like chemicals, herbicides and pesticides, but they don’t understand the possible harmful outcomes of genetic engineering, such as pathophysiology or prion proteins. So I am explaining to him about the potential untoward effects of these foreign proteins, but he just did not understand.”

http://www.theatlantic.com/hea...
The Very Real Danger of Genetically Modified Foods
"
"Monsanto's claim that human toxicology tests are unwarranted is based on the doctrine of "substantial equivalence." This term is used around the world as the basis of regulations designed to facilitate the rapid commercialization of genetically engineered foods, by sparing them from extensive safety testing.

Flag

10 people liked this. Like ReplyReply

DavidBN 2 days agoin reply to hshields

This is rampant speculation. Transmissible prion diseases are exceptionally rare in humans, and have never been linked to any plant source, genetically modified or otherwise. You're fretting over the most improbable of theoreticals, and ignoring the benefits.

"Monsanto's claim that human toxicology tests are unwarranted is based on the doctrine of "substantial equivalence."

Well, yes, that's because BT toxin is safe to humans. It's used to control pests on your organic produce.

Flag

12 people liked this. Like ReplyReply

OccupyPsyche 18 hours agoin reply to DavidBN

What are the benefits? I have not heard of any..from what i have read there are crop failures and lower yields.

Flag

1 person liked this. Like ReplyReply

RagingBrook 2 days agoin reply to hshields

Huh, this Kirk seems like a completely unbiased and credible source. Prion proteins are incredibly rare and would almost be impossible to create by accident. Furthermore, GM foods do not create any proteins by accident. GM foods may not be tested extensively for human safety, which is a shame, but they are certainly tested for gene and protein expression. As someone who has done more than a few Western blots I can say that you usually get non-specific binding bands which are not the protein you are targeting. It does not mean that "These unknown proteins had been created during the gene insertion process". As for a plant biologist not knowing about prions in 1997, that is hardly surprising because we knew barely anything about prions back then and they were not part of the educational curriculum.

Flag

10 people liked this. Like ReplyReply

dodanimal 1 day agoin reply to DavidBN

The insertion of powerful DNA expression promoters and proteins that are very different from those occurring naturally in plants can have dangerous, unintended and unanticipated consequences. Some plants produce toxic chemicals and may even produce harmful proteins or peptides. It is arrogant in the extreme to assume, as you do, that all possible combinations of DNA, proteins and biochemistry is safe for everybody to consume for a lifetime.

There is a good counterexample: the tryptophan tragedy of the 1980s. This tryptophan was produced by genetically engineered bacteria, and the problem started when the bacterial genome was altered to increase tryptophan production. An unexpected accident was that this also caused the bacteria to produce an unknown toxic chemical. People died and many were sickened.

So today we have untraceable and unlabeled GMOs infiltrating the food supply. Nobody knows their exposure and you cant even find out. There is no way for consumers to determine if GMOs may be causing chronic, subtle health problems.

the FDA declared GMOs safe based on a hypothesis that still has yet to be tested. Thats not scientific. Thats corruption.

Flag

12 people liked this. Like ReplyReply

OccupyPsyche 18 hours agoin reply to DavidBN

Maybe what we are missing are tools/RNA to keep the evolution going if we are eating food further from nature. I think the effects are likely to be long lasting at this point. I think this study would be even more interesting if continued..with all types of food. What is food trying to impart us with? We already know they evolved them selves to attract our attention.

Flag

1 person liked this. Like ReplyReply

Steven Eisenberg 1 day agoin reply to anononodon

Clearly you don't understand that the modifications made by Monsanto to plants we ingest are modifications that could have NEVER have happened naturally.

I'm pretty sure that canola plants can develop herbicide resistance naturally.What is less likely to

happen naturally is the development of canola itself, a 1970's product of conventional plant breeding.

A lot of so called so-called conventional plant breeding, since the 1920's, has been helped along by radiating a large number of seeds, and planting them to see what happens. Almost surely these are included among seed varieties sold by anti-GM, anti-hybrid heirloom seed companies. That would be more likely to generate some strange unexpected effect than directed techniques such as GM.

This of course isn't to slam induced mutation breeding. It gave us one of my favorite veggies, snap peas :-)

Flag

4 people liked this. Like ReplyReply

Jason 1 day agoin reply to anononodon

Hmmm. so exposing seed to either a chemical mutagen or irradiation that will scramble the DNA in weird and unpredicatable ways causing mutations and traits that would be unlikely to occur naturally is natural? Forcing two different species to cross in a laboratory - species that would never be able to cross in nature - is natural, a process that can and does introduce unknown genes of unknown toxicity, allergenicity, etc? Would any plant used in agriculture survive in nature - ie outside a well-tended paddock without weed control, water, fertiliser, etc. In nearly all cases the answer is no. So what do we mean by natural?
Jason Major, Manager, TechNyou, University of Melbourne

Flag

9 people liked this. Like ReplyReply

AtlanticMM 55 minutes agoin reply to anononodon

This is an incorrect assumption on two count. 1) heck yeah these can occur naturally. Selective breeding and such is totally based upon mutations and differences and 2) there is no inherent reason to believe that a non-natural (if there is such a thing) trait is any more likely to be harmful than a natural trait.

It is very likey that many now-poisonous berries, fruits, plants were at one point no poisonous. Those that mutated to poision, very harmful to us, did so naturally.

Flag

Like ReplyReply

Joseph Kaye 2 days agoin reply to DavidBN

I think you're comparing apples and frankenoranges here.

Flag

9 people liked this. Like ReplyReply

DavidBN 2 days agoin reply to Joseph Kaye

Then it's an apt comparison, as both apples and oranges are frankenfruits; find me a wild sweet orange or sweet apple growing while in China or central Asia. Neither fruit is sweet in the wild. Human beings have been meddling with genetics of both plants for centuries in complete ignorance of such entities as the metabolic syndrome and interference RNA. There's no reason to assume that this blind meddling was any less dangerous than directed meddling.

Flag

7 people liked this. Like ReplyReply

Joseph Kaye 2 days agoin reply to DavidBN

I disagree*. Evolution isn't motivated by profit.

*Respectfully, of course.

Flag

9 people liked this. Like ReplyReply

DavidBN 2 days agoin reply to Joseph Kaye

So, you would find genetically modified foods created through non-profit funding, such as the golden rice project, acceptable and safe?

Flag

7 people liked this. Like ReplyReply

OccupyPsyche 17 hours agoin reply to DavidBN

Who are you defending? Monsanto? Are you just defending your corn chip habit so you don't feel bad about it ..are you too broke to buy organic and feel bad you justified feeding your kids GMO likely items. Do you keep telling yourself it's ok so you feel ok about it? I really don't understand defending these crops..we do not need them. We need better farming practices

Flag

1 person liked this. Like ReplyReply

DavidBN 3 hours agoin reply to OccupyPsyche

Are you just defending your corn chip habit so you don't feel bad about it ..are you too broke to buy organic and feel bad you justified feeding your kids GMO likely items.

Eh, let them eat cake.

Flag

Like ReplyReply

gulfkraken 2 days agoin reply to Joseph Kaye

Selective plant breeding through cross pollination, selective planting, and natural mutation have been carried out by mankind since time immemorial. They were all motivated by "profit," or "having enough to eat," as they used to call it.

Flag

9 people liked this. Like ReplyReply

OccupyPsyche 17 hours agoin reply to gulfkraken

and those methods are fine. The article suggests that RNA transmits a kind of knowledge to our body's. I think that is amazing. I guess I want to be programmed by nature not GMO's if that is the case. If it is even remotely possible what they say there ...it's really remarkable

Flag

1 person liked this. Like ReplyReply

grifty 2 days agoin reply to Joseph Kaye

What does that have to do with safety? You're right of course...evolution has no motive. It doesn't care if you live or die, if apples are sweet or poisonous to humans. If it did, all plants would be delicious and healthy for humans to eat..since we're REALLY good at distributing the things we like.

Flag

1 person liked this. Like ReplyReply

Sean Dixon 1 day agoin reply to DavidBN

Yes, you do start with a healthy mistrust of food plants. Those small red berries look delicious, but they might be poison.

Flag

1 person liked this. Like ReplyReply

DavidBN 21 hours agoin reply to Sean Dixon

You're not talking about food plants; you're talking about things you find growing wild. I'm talking about plants that are raised by people with the intention of providing food.

Flag

Like ReplyReply

OccupyPsyche 18 hours agoin reply to DavidBN

Hybridizing it is not the same thing in any way....even grafting etc..are natural even if not found in nature. Splicing genes of animals into food plants..(AND THEN LETTING THE POLLEN GO EVERYWHERE!!!) could not ever occur outside a lab, and SHOULD not be out in the open. GMO grass seeds that's an insane idea....what if it killed grasses everywhere? is that worth it? GMO apple trees!! not in my American Apple Pie
All strains of food plants were cross pollinated to get the plants we have today ..it takes generations to get the final result .. I believe we will not really know the effects of this dangerous experiment until many of the children growing up solely on these foods, show the resulting effects. They are already saying that this generation of kids is the first that will not out live there parents.

Do not forget that these crops cannot grow with out Round-Up pesticide..they are called Round-up ready crops..go ahead look up how great Round-Up is for ya!

Flag

2 people liked this. Like ReplyReply

Analog Kid 2 days agoin reply to Joseph Kaye

Exactly. Same with big pharma. Push a drug through quickly to get it to market. We'll deal with any detrimental health consequences later.

It's always profit over people when it comes to companies like Cargill, et al.

Flag

7 people liked this. Like ReplyReply

gulfkraken 2 days agoin reply to Analog Kid

I need instructions for a new tin foil hat. Could you pass along the specifications on yours please?

Flag

6 people liked this. Like ReplyReply

Marian Shatto 16 hours agoin reply to gulfkraken

Please go read about DES, vioxx, and thalidomide.

Flag

Like ReplyReply

jablowski 1 day agoin reply to Joseph Kaye

all discussion of the central dogma is completely irrelevant when you consider that the ribonucleic acid in question is regulatory miRNA, as mentioned in the very abstract of the paper you cite. this may seem like a nitpick, but miRNA is only indirectly involved in translation (ie. it does not code for protein, although it could affect how other proteins are translated).

eta: this was not supposed to be a reply.

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1 person liked this. Like ReplyReply

Tomasgolfer 2 days ago

Monsanto's website states, "There is no need for, or value in testing the safety of GM foods in humans."

That should scare everyone.....

Flag

50 people liked this. Like ReplyReply

grifty 2 days agoin reply to Tomasgolfer

I wonder if that is because of extensive animal testing? It does sound like a scary statement on its face..but whats behind it? Whats the context?

Flag

2 people liked this. Like ReplyReply

PaulGS 1 day agoin reply to Tomasgolfer

Doesn't scare the Canadian Food Inspection Agency , the Japanese Minstry of Health, the United Nations Food and Agricultural Organization, the World Health Organization, or the OECD.

You know something they don't?

Flag

4 people liked this. Like ReplyReply

dodanimal 1 day agoin reply to PaulGS

Corrupt bureaucracies, all of them. I am not impressed by assurances of safety from captured government agencies.

Flag

5 people liked this. Like ReplyReply

PaulGS 1 day agoin reply to dodanimal

You see people get sick from our food often? Ever seen someone sick from eating GM food? Ever?

Flag

1 person liked this. Like ReplyReply

dodanimal 1 day agoin reply to PaulGS

How would anyone ever know if GMO food is making them sick? There is no way to know, except through rigorous science, which isnt being done.

GMOs were slowly introduced over years, are unlabeled, and even contaminate organic/non-GMO foods. Consequently it is impossible for anyone to connect an illness or health outcome with GMO exposure.

You dont seem to understand how difficult it is to connect cause and effect in medicine. Its difficult. VERY difficult.

Flag

6 people liked this. Like ReplyReply

OccupyPsyche 16 hours agoin reply to PaulGS

YES pigs and cows ...

Flag

Like ReplyReply

OccupyPsyche 16 hours agoin reply to PaulGS

You trust them? If you do then.. really anything you say is not really holding water for me. Your logic is flawed .. your willingness to believe and trust any government agency shows your basic make-up. Lobbyists. Money. Stock Markets. Guys who invested and want to make money in a new market as fast as they can before it is outlawed. maybe that's why?

Flag

1 person liked this. Like ReplyReply

USA_objector 2 days ago

This article seems to have been written by a tenth grader with a thesaurus. In December 2011, the International Journal of Biological Sciences linked GMOs to liver failure in laboratory testing. http://www.infowars.com/monsan...

Monsanto is adding "Round-Up" pesticides to its corns without any concern about how ingestion will affect humans. http://naturalsociety.com/mons...

Get smart and start doing some real reporting, Atlantic. This is a global crisis that demands scrutiny. With GMOs, we're not ingesting "information," we're ingesting toxins.

Flag

28 people liked this. Like ReplyReply

Joshua Northey 2 days agoin reply to USA_objector

Who cares? People need food and most people already live well past their productive years anyway.

If we are going to support 10 billion people on this planet we are going to need A LOT of GM foods.

Flag

8 people liked this. Like ReplyReply

anononodon 2 days agoin reply to Joshua Northey

most people already live well past their productive years anyway...

Yes, do us all a favor and eat as many GM foods as you can. You might try some paint thinner and perhaps a little bit of asbestos. Anything you can do to thin the world of idiots who post statements like that would make the world a better place.

Flag

18 people liked this. Like ReplyReply

Joshua Northey 1 day agoin reply to anononodon

I am sorry, everyone is a special unique flower who deserves a million free dollars upon birth and should never have to work a day.

Is that better?

Get back to me when you are in touch with reality.

Flag

1 person liked this. Like ReplyReply

Kamana Kapu 2 days agoin reply to Joshua Northey

Why is there even one human on the planet? No human has ever done anything positive for the planet, the environment, or any of the other living things on the planet. All we humans do is consume the planets meager resources and occupy the planets limited spaces. Everything we humans do we do for ourselves. We are the epitome of what a super-parasite is all about. A single earthworm dose more for Mother Nature than any human that has ever lived or will ever live.

The only positive thing we humans could ever do for Nature is to leave the planet...by dying.

Flag

4 people liked this. Like ReplyReply

gulfkraken 2 days agoin reply to Kamana Kapu

I laughed so hard I hurt after I read that. Good parody is hard to find these days.

That was parody wasn't it?

Flag

10 people liked this. Like ReplyReply

OccupyPsyche 16 hours agoin reply to Joshua Northey

You sick sick man...what about the children and the children they have??

Flag

Like ReplyReply

Natural Grocers 5 hours agoin reply to Joshua Northey

Yep, Joshua, you have succinctly restated the GMO manifesto as outlined here: http://bit.ly/sr8rma
But do we really want to make ag policy based on beliefs rather than facts?

Flag

Like ReplyReply

Kirian 2 days ago

Speculative and very highly reactionary. Also, whitewashing and
alarmist to the point of being incorrect with regards to the
underlying science. The columnist is conflating RNA and DNA, and almost totally ignores the biology of microRNAs and prerequisites for their regulatory impact. In fact, the columnist doesn't even take time to /outline/ how microRNAs actually work, where they occur -- just assumes that microRNAs are everywhere and in every gene. They aren't.

MicroRNAs are encoded by specific sequences of DNA, just like any other
RNA. It is possible for a protein-coding gene to also contain a
microRNA-coding sequence, but it is highly uncommon. Combine that with
the low number of unique microRNAs relative to protein-coding genes --
in humans, there are about 1500 known microRNAs compared to
about 18000 protein-coding genes -- and it becomes very very unlikely
for any one gene to co-occur with a microRNA. The odds of that gene being
the gene of interest in a GMO -- vanishingly slim. Unless /that specific introduced gene/ also contains a microRNA sequence, the types of microRNA in a GMO organism are going to be /exactly/ the same as in the non-GMO parent.

Even if said gene does contain a microRNA, for that microRNA to have an effect on human processes, it has to have a compatible sequence with some human RNA that is expressed in cells it can get to... and there has to be /enough/ of it to make a noticeable impact on the equilibrium of normal

molecular regulation... which itself has built-in tolerances and feedback mechanisms by which to correct for such environmental influences, at least to a point.

Yes, what you eat affects your health, in more ways than one. No, GMOs are not any more detrimental in that respect than their non-GMO kin.

Flag

46 people liked this. Like ReplyReply

mirnad 2 days agoin reply to Kirian

Kirian's science is correct, but I think the author might be on the right track (though from the article I'm not sure whether he got there by accident or not).

It is my understanding (and this may be incorrect) that the GM food that is in the food system now generally contain a modification that introduces a protein, or changed the level of a protein by modifying a non-miRNA regulator. So like Kirian says there would be very little danger of that generating a miRNA. But there has been some work by people at the Max Plank in introducing artificial miRNAs (amiRNAs) themselves into the genome of rice, with an eye towards improving agricultural yields. This was from 2008.

http://www.plosone.org/article...

I have no idea how close this would be to our food supply, but would suspect that this is the ultimate goal of the research.

If the biotech companies start using that technique, then the author is right on his general premise that someone should be looking at that. Or just not use that particular technique.

That said, I am generally disgusted by people with the means to choose which food they eat having this anti-science knee jerk reaction to genetically modified food. Yes, it needs to be studied but it is morally bankrupt not to consider genetic modification of foods that could potentially be a useful tool for feeding our overpopulated planet.

Flag

15 people liked this. Like ReplyReply

ari levaux 2 days agoin reply to Kirian

I would have loved to go into more detail, but couldn't for space reasons. Still your detailing of what is believed to be true about microRNA doesn't change my argument that substantial equivalence is bunk, and toxicity testing would be wise.

As you said:

"It is possible for a protein-coding gene to also contain a
microRNA-coding sequence, but it is highly uncommon."

I'm curious what percentage range you have in mind for "highly uncommon?" Also curious how you would have arrived at that percentage.

But more to the point, that is exactly my point. To quote you again: "It is possible for a protein-coding gene to also contain a microRNA-coding sequence." That, and reasons like that, are why substantial equivalence doesn't work, and why toxicity testing needs to happen.

You also mentioned: "Even if said gene does contain a microRNA, for that microRNA to have an effect on human processes, it has to have a compatible sequence with
some human RNA that is expressed in cells it can get to... and there has
to be /enough/ of it to make a noticeable impact on the equilibrium of
normal molecular regulation."

I agree with that. It's a long shot. But it's possible, and that's a fact. And that's why we should be testing for toxicity in humans. Especially since not every GMO is a simple gene insertion. They're getting more and more complex, which makes the improbable all the more likely.

I'm curious why you think toxicity testing of GMs is a bad idea.

(Edited by author 2 days ago)

Flag

7 people liked this. Like ReplyReply

PaulGS 2 days agoin reply to ari levaux

Ari, you're the one peddling the bogus claim that there is a "very real danger" in GM foods.

How about you support that nonsense first before asking someone else (who is obviously much better eductated on the the matter) to defend his position?

Flag

7 people liked this. Like ReplyReply

OccupyPsyche 17 hours agoin reply to PaulGS

Educated by the same people making the stuff...

Flag

Like ReplyReply

mirnad 2 days agoin reply to ari levaux

"I'm curious what percentage range you have in mind for "highly uncommon?" Also curious how you would have arrived at that percentage."

We know where the proteins in a genome are by sequencing messenger RNA that is in the cell and matching it up to the genome. We know we know where the miRNAs are by sequencing short RNAs that are in the cell (those that are about 21 bases) and matching them up with the genome. You can see what the overlap is by comparing the two datasets. Then to get at "highly uncommon" you would just divide.

In humans, the miRNAs are generally in between genes, or within genes in the part that gets spliced out (the introns). In plants the miRNAs are generally not within genes at all, but you would have to look up the most recent annotations to get at the exact percentage for e.g. rice.

This shows how it is done in human. In this case, uncommon mean "none" but it's old. There are something like 1000 miRNAs known in human now.

http://genome.cshlp.org/conten...

This is a newer one with the newer technology, and a higher number.

http://www.biomedcentral.com/1...

Here it is in rice from Sunkar et al.:

http://www.biomedcentral.com/1...

From the article, "In plants, most known miRNAs are found in between the coding genes, although a few
are found in sense or antisense orientations in introns and exons of protein-coding
genes."

Could this be not true since they are still discovering new miRNAs? Unlikely. The ones expressed at high levels are known and keep coming up over and over. The ones that are rare might be slightly different but probably don't do much since they are so rare, and particularly are unlikely to have

much effect if digested. e.g. you might get a some copies in your body if you eat a whole lot of rice, but each copy can only knock down one transcript. In cells they are really produced at very high levels to do anything.

It is difficult to get a miRNA within the DNA that codes for a coding region of a protein because the protein has to have a certain structure that has to do stuff, determined by the selection and order of amino acids in the protein. The DNA nucleotides that describe the protein therefore have to be in a specific order to code to get the right amino acids in the right order into the protein. In a miRNA, the DNA nucleotides have to be in the right order for the RNA produced by the DNA to form a hairpin that binds with itself. This means it has to contain a palindrome. So for a bit of DNA to both code for a functional protein, and a miRNA, it has to both say the right thing AND be a palindrome. So it's hard to be both. Also, you need the regulatory sequences around it, too.

A miRNA could still live within the intron of a gene that gets introduced into a genome by genetic modification, though as pointed out in Sukar these are unusual in plants. However, if you are at the point where you know enough about a protein to want to stick it in a plant it is generally very well characterized and you would have to be a bit of a b0nehead to stick an extra miRNA into the plant that doesn't belong there, especially since it would be so easy to excise it from the intron.

I don't object to safety testing, but I object to the characterization of this as a "very real" danger.

(Edited by author 1 day ago)

Flag

11 people liked this. Like ReplyReply

ari levaux 2 days agoin reply to mirnad

I didn't write the headline, and can only speak to what was in the body of the piece.

I think substantial equivalence is outdated, and Monsanto's stance against toxicity testing is transparent, arrogant, and reckless. microRNA shows just how much more complicated things are than the assumptions built into substantial equivalence. That said, microRNA provides nothing more than a possible path by which a problem might occur.

One could also point to potential allergies as reason for toxicity testing.

(Edited by author 2 days ago)

Flag

8 people liked this. Like ReplyReply

gulfkraken 2 days agoin reply to ari levaux

"I didn't write the headline, and can only speak to what was in the body of the piece."

I would be ashamed to claim even that.

Flag

6 people liked this. Like ReplyReply

mirnad 1 day agoin reply to ari levaux

They do screen GM proteins for being potential allergens, just not through human trials. They do this by analyzing whether novel introduced proteins are similar to known proteins. It is also important to know whether the protein in question breaks down quickly when it hits the digestive track, and whether it gets absorbed. This testing can also be done in vitro using blood serum of people with known allergies. I believe it is in Europe but could not find anything about the FDA without wasting all afternoon because all the top google hits are dominated by loonies.

Introduced proteins that could cause allergens in humans cannot be used in human products, which is, if my recollection serves me, why there was that big recall of corn taco shells a while back because some potentially allergenic corn was used.

I would expect that the approach they use is more likely to pick up human allergies than a controlled trial in humans because individuals allergic to something are rare. So you would have to have an enormous number of people in the trial to actually find the few that have an allergy. You would need even more to identify them to a statistically significant degree.

But if you disagree that this screening is adequate then you need to address areas where it might fail, through attacking the science, not speculation about what might happen. This isn't easy because the science is complex. I agree that their technology is not perfect but I think their science is generally pretty firmly grounded.

I think articles like this should be written, and in places like the Atlantic. I thought that most of the basic science in this article was actually well-understood and well-presented (Edit: I didn't notice the error in the second sentence). But I don't think the interpretation of the science was correct.

I would also say that if people don't like GM food as an emotional preference and think that it should be labelled for that reason alone then it should be labeled, without the need to invoke sketchy science. We are democracy and we can have whatever we want and it is not the government's place to solve Monsanto's marketing problems for them.

Flag

8 people liked this. Like ReplyReply

PaulGS 1 day agoin reply to ari levaux

Sheesh. You write an alarmist piece of junk science crap and then walk away from the stink bomb you created. Get real.

Flag

2 people liked this. Like ReplyReply

RagingBrook 2 days agoin reply to ari levaux

I think the key phrase from your reply above that is missing in the article is this:
"It's a long shot"
If you stated that in your article, instead of hyping the threat, than I would have no problem. However, that is not what you are doing. In fact the Chinese study, which I read, suggests nothing to the effect of the following:
"The Chinese RNA study threatens to blast a major hole in that claim. It
means that DNA can code for microRNA, which can, in fact, be hazardous."
The study says nothing about the miRNA being hazardous - it just says that a few of the most stable and highly expressed miRNAs are present at very low, but detectable levels in human and animal tissues. The study goes on to show that one miRNA sequence can affect the activity level of one protein when done in vitro or if large quantities if the miRNA are injected, although the methodology of those experiments is not totally convincing for me.

Flag

6 people liked this. Like ReplyReply

mirnad 1 day agoin reply to RagingBrook

Also, the study should be linked to in the article.

Flag

4 people liked this. Like ReplyReply

mem_somerville 2 days agoin reply to ari levaux

So are you avoiding rice now that you have heard about this miRNA? You don't know how it's working. And this wasn't a GMO.

I think you should avoid all plants until you know more. Oh, wait, better stop eating meat too--those sequences would be even more closely related.

Report back on how your water diet is going in about 4 weeks.

Flag

6 people liked this. Like ReplyReply

ari levaux 1 day agoin reply to mem_somerville

The thing is, we already know which plants are potentially allergenic and which ones are poisonous. We've already learned that, over thousands of years. And we learned it the hard way. Apparently Monsanto and it's supporters would prefer that we continue to learn the hard way.

Flag

1 person liked this. Like ReplyReply

James Connolly 22 hours agoin reply to ari levaux

If what you say is true then plants have been giving us harmful RNA for thousands of years which means that if any of it were sufficiently harmful we would have built up a mechanism to defend against it (or died). If a product is only harmful in massive doses then why worry, everyone gets to die from something.

In my opinion we are safer when we know the DNA that is in our crops, what better way to know that than when our crops are genetically engineered, now if only we could fit the entire genome sequencing somewhere on the package, next to calories?

You are acting like one falling satellite could end human life on earth when the reality is that it is overwhelmingly likely that it will hit water or end up in the middle of nowhere.

When it takes great mental leaps to get from your original premise to your conclusion you might be doing something wrong.

Flag

2 people liked this. Like ReplyReply

dodanimal 1 day agoin reply to Kirian

OK, then explain the tryptophan poisoning that was caused by genetically engineered bacteria. The bacteria unexpectedly starting producing an unknown toxic chemical after their genome was altered a second time. Some people were permanently disabled from this toxin.

Whats speculative here is YOU assuming that radically novel genes and promoter sequences cannot ever produce proteins or RNA with enzymatic activity resulting in toxic byproducts. Biochemistry is complex. You have no appreciation for the complexity and unpredictable nature of biochemistry when radically novel proteins are inserted.

The GMO apologists certainly cannot justify everyone in the population consuming this garbage in large quantities for an entire lifetime.

The "substantial equivalence" notion is a hypothesis that has never been tested.

Flag

6 people liked this. Like ReplyReply

DavidBN 21 hours agoin reply to dodanimal

The honest answer is that we don't know what caused the late 80's outbreak of tryptophan associated poisoning. No toxin was ever identified, and it have simply been overdose toxicity.

Whats speculative here is YOU assuming that radically novel genes and promoter sequences cannot ever produce proteins or RNA with enzymatic activity resulting in toxic byproducts.

No, I don't assume any such thing. I just think that conventional methods of breeding are no less likely to result in toxic byproducts, and that distrust of genetically modified foods rests more on intrinsic biases regarding such things as science, nature and the corporate agriculture than it does on any empirical basis.

Flag

Like ReplyReply

dodanimal 19 hours agoin reply to DavidBN

Overdose toxicity as an explanation is a complete nonstarter. Completely bogus. Large doses of tryptophan do not cause the syndrome. After purification procedures were tightened, the problem went away. Tryptophan is again on the market and there have been no cases of the syndrome. There was some kind of toxic material in the tryptophan that was a result of the genetic engineering. This

phenomenon means that GMO food should be tested to make sure this is not happening with plants.

The tryptophan tragedy provides an empirical basis for not trusting GMOs!

"I just think that conventional methods of breeding are no less likely to result in toxic byproducts..."

Thats another unjustified, unscientific assumption by you.

The reality here is that the unscientific declarations of safety for GMOs are motivated by greed and corruption. The science of GMOs has been corrupted.

Your statements are a ridiculous LOGIC FAIL.

Flag

1 person liked this. Like ReplyReply

DavidBN 3 hours agoin reply to dodanimal

There was some kind of toxic material in the tryptophan that was a result of the genetic engineering.

If we don't know what the toxic material is, then how do we know what caused it to get into the product? You are concluding that it was a result of genetic engineering by Showa Denko, but this kind of engineering was and is ubiquitous in the pharmacological industry. You need to do better than that if you want to accuse anyone of a logic failure.

Flag

Like ReplyReply

dodanimal 1 hour agoin reply to DavidBN

There is a lot of evidence indicating that the problem is related to the bacteria, and specifically the genetic engineering. For starters, bacterial fermentation with a nearly identical strain was used for years by Showa Denko prior to the problem. The problem started when the bacteria were genetically engineered to increase tryptophan production. The problem stopped when the returned to the original bacteria they had been using. All other steps in production and purification were unchanged. So, it was the genetic engineering that did it.

The FDA, Monsanto et al. lied about and refused to investigate exactly what happened with Showa Denko. This was a political decision, because at the time Monsanto et al were working on genetically engineered foods and crops and were anticipating new regulations.

I am well aware that genetically engineered bacteria and yeasts are used to manufacture nutrients and drugs. This is an appropriate use of genetic engineering BECAUSE THE PRODUCTS ARE TESTED (though of course this testing may be imperfect as in the case of Showa Denko). In the Showa Denko incident, the problem could be isolated and the GM bacteria did not spread to contaminate crops and foodstuffs around the world, which is what has happened with GMO plants.

You should educate yourself more about the Showa Denko incident.

Flag

Like ReplyReply

OccupyPsyche 17 hours agoin reply to Kirian

You science snobs are so lost in your books. WE WANT A LABEL ON THE CRAP... and we will have it. WE do not TRUST THEM OR YOU! TRUST get it? You sound like a paid spin doctor. Go ahead and eat it and feed it to YOUR KIDS! oh you don't have any? figures

Flag

1 person liked this. Like ReplyReply

Ulvskog 2 days ago

wince. "Chinese scientists discover the blatantly obvious, world stunned." What exactly are cultivated crops anyway? If we look at human history, we've been selecting for certain characteristics and determining which ones we like best and are most economically valuable for hundreds of years. How is this all that different from "genetic modification?" On a large enough time scale, everything is a "genetically modified" food if it is cultivated by human hands. Should we switch to a more haphazard model of paying hunters to go out and shoot deer for us? Maybe women should abandon their interest in advanced education and living past 40 and pick up a bowl and go out and forage? These continued silly scare tactics employed to sell routine science as "stunning" and "hazardous" bore me to death.

Flag

14 people liked this. Like ReplyReply

anononodon 2 days agoin reply to Ulvskog

"How is this all that different from "genetic modification?"

If you have to ask that question, then maybe you shouldn't' be spending your time defending something you don't understand?

Flag

5 people liked this. Like ReplyReply

Ulvskog 2 days agoin reply to anononodon

Well, maybe until you have memorized Robert's Rules of Order and taken a course in Dialectic and Rhetoric you shouldn't be spending time on the Internet responding to posted comments on things you don't understand? And learn to ride a bicycle while you are at it!

If you can explain how gm modification is different than select cultivation and breeding, please do. I'd be very fascinated to know your position?

Flag

3 people liked this. Like ReplyReply

Vanna L 1 day agoin reply to Ulvskog

Jesus, I'm not even a scientist and I can tell you how select cultivation and breeding is different than GMO. There is no way that any form of select cultivation and breeding as practiced up until the late 20th century could have inserted the DNA of an animal, plant of another species, or a bacterium into another plant. You need 20th century technology to do what farmers did using nothing more than seed sorting, isolating desired cultivars and rebreeding them. It wasn't done at the micromolecular level and took place over many generations--not cocked up in a test tube. Sheesh.

Flag

6 people liked this. Like ReplyReply

DavidBN 20 hours agoin reply to Vanna L

There is no way that any form of select cultivation and breeding as practiced up until the late 20th century could have inserted the DNA of an animal, plant of another species, or a bacterium into another plant.

Wild Emmer wheat is a result of crossbreeding between two distinct species of wild grass. Most modern wheats are the result of cross species breeding with yet another diploid grass and wild Emmer. The result has been a plant with six chromosomes from three different species. And the

cross breeding did not occur over generations. It only had to happen once, and be propagated thereafter.

Flag

1 person liked this. Like ReplyReply

David Chancellor 2 days ago

With 7 billion people and growing, with arable land and water tables in free fall, I believe the last great hope for humanity to make it through this is in GMOs. We need crops with traits to thrive in increasingly resource poor environments. Ask any person, if they would rather starve today, or have a possible increased disposition for certain disease conditions in the future and you will get the same answer every time.

(Edited by author 2 days ago)

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4 people liked this. Like ReplyReply

anononodon 2 days agoin reply to David Chancellor

No sorry, that's the last great hope of massive companies like Monsanto.

The last great hope for humankind is for people to get off their lazy asses and get out and start growing some of their own food in their gardens again.

Perhaps you didn't know this but cancer was practically unknown until the world adopted the "better living through chemstry" motto.

(Edited by author 2 days ago)

Flag

14 people liked this. Like ReplyReply

vepxistqaosani 2 days agoin reply to anononodon

That would be because in the Good Old Days before "better living through chemistry" very few humans lived long enough to develop cancer. Which, by the way, was not unknown in the past -- but, thanks to chemical and biological research, most of the things that killed people so young back then are unknown today, leading to astounding ignorant remarks like yours.

Do you have any idea how much arable land would be required to feed 7 billion people using 'natural' methods? And how exhausting subsistence farming is?

Flag

12 people liked this. Like ReplyReply

DavidBN 2 days agoin reply to anononodon

The last great hope for humankind is for people to get off their lazy asses and get out and start growing some of their own food in their gardens again.

We did this in the past; there's a reason we quit. The good things you enjoy about civilization - art, engineering, medicine - are impossible when we all have to dedicate most of our time simply to getting enough to eat. Land becomes the only true metric of wealth, most humans are reduced to the status of serfs lorded over by those with weapons, and warfare for scarce resources is a constant.

Perhaps you didn't know this but cancer was practically unknown until the world adopted the "better living through chemstry" motto.

Cancer has been known for all of recorded history. We have skeletons many thousands of years old with calcified tumors in them. The name itself was coined by Hippocrates, who likened the pain caused by the disease to the constant pinching of a crab. Because the disease is internal, though, not much was known about it until autopsies became common many centuries later.

I would no more conclude that cancer is a recent phenomenon than I would conclude that the earth began to orbit the sun in the 17th century.

Flag

15 people liked this. Like ReplyReply

Nathan Tompkins 2 days ago

How can you determine whether produce you buy is genetically modified? Does USDA "Organic" indicate that it is not a GMO? And conversely, should we assume "conventionally"-grown foods are genetically modified on today's farms? Is Monsanto the only laboratory manufacturing GM crops, or just the biggest industry movers?
Sorry for the ignorance, but I feel like I need to get a handle on some of these logistics before I can even begin to make an informed decision at the grocery store.

Flag

Like ReplyReply

Michael Bulger 2 days agoin reply to Nathan Tompkins

USDA "Organic" does indicate that it is not a GMO. Most fruits and vegetables are not GMO. Corn and soy are commonly GMO and are components in many food products. Monsanto is not the only corporation manufacturing GM crops, but they control a very large share of the seed market.

I hope this helps.

Flag

2 people liked this. Like ReplyReply

Nathan Tompkins 4 hours agoin reply to Michael Bulger

very helpful, thanks. But if grain or soy-based foods like bread or soy milk include genetically-modified ingredients will it have to say so on the ingredients list? Or is there no way to tell which products are using the GM crops?

Flag

Like ReplyReply

minstrelmike 2 days ago

It is true that we have been genetically modifying our food for thousands of years.

However, it is also true that those experiments were carried out over periods measured in human generations, time enough for teratogens such as thalidomide to show up quickly enough to be avoided and not put an entire generation at risk. What if thalidomide had been in the food chain and sat there for a few years?
I wonder what is slipping thru the cracks. I agree we need food technology for the 7 billion but I feel Monsanto's the urge to skip testing is merely for profit. If they slowed down, they would make less money but we would be that much safer. Ask them where their priorities truly lie (then ask them about suing farmers in Canada over freely-pollinated corn).

They will try to make this a for or against issue when it is simply a matter of taking their foot off the accelerator.

Flag

10 people liked this. Like ReplyReply

Nathan Tompkins 2 days agoin reply to minstrelmike

Taking your foot off the accelerator = 'against' when it comes to corporate industry - whether it's our finances or our food. You could say it's in their genes.

Flag

3 people liked this. Like ReplyReply

DavidBN 2 days agoin reply to minstrelmike

However, it is also true that those experiments were carried out over periods measured in human generations, time enough for teratogens such as thalidomide to show up quickly enough to be avoided and not put an entire generation at risk.

Really? From antiquity, we rather carefully bred much of our fruit for high levels of a rather potent metabolic poison - simple sugars. And we refined and fermented many of them to make ethanol, a known teratogen that has caused, and continues to cause, many order of magnitude more birth defects than thalidomide ever has or will.

Flag

4 people liked this. Like ReplyReply

minstrelmike 2 days agoin reply to DavidBN

And we homo sapiens adapted along with our use of alcohol.
That was kind of my point.
We didn't suddenly convert more than 50% of our food crops.
Fort Collins Colorado is inordinately proud of their 11 breweries but tend to play down the fact that the local hospital treats 10 alcohol overdoses a week. We don't need perfection, but we need time to adapt.

Flag

4 people liked this. Like ReplyReply

Vanna L 1 day agoin reply to DavidBN

Oh, please. Fructose and other sugars are actually food. Calling them metabolic poison is just plain ridiculous. And ethanol isn't in the same class as thalidomide. We KNOW what ethanol can do--no one KNEW, or didn't bother to research, the effects of thalidomide.

Flag

4 people liked this. Like ReplyReply

DavidBN 3 hours agoin reply to Vanna L

We drank alcohol for thousands of years before discovering it was a teratogen in the 19th century. My point was that we can't trust our ancestors to have bred plants that are healthy and safe to eat by the fine-grained, 21st century standards that we apply to, say, pharmaceuticals and some are arguing that we should apply to GMODs. You can't REALLY trust that the heirloom tomato in your hand, if widely consumed, would not increase the incidence of colon cancer in the population by 0.0032%. No one has ever looked.

Flag

Like ReplyReply

Joshua Northey 2 days ago

We already have been modifying our foods for thousands of years. That is what "breeding" is.

Of all the things to be worried about GM foods are not one of them. They will be an unmitigated triumph for mankind, one of the best ways for us to increase the carrying capacity of the planet and reduce our environmental impact.

Flag

5 people liked this. Like ReplyReply

anononodon 2 days agoin reply to Joshua Northey

We already have been modifying our foods for thousands of years. That is what "breeding" is.

Congratulations on getting it COMPLETELY wrong.

Flag

6 people liked this. Like ReplyReply

Joshua Northey 2 days agoin reply to anononodon

I doubt you know the first thing about biology. It is exactly the same. Cross-breeding plants is extremely old, and inserting genes in them is essentially the same but quicker.

The risks here are tiny compared to the potential benefits, but keep clinging to your anti-science hysteria if you must. The Intelligent Design support group meets at 3 if you want to join your friends.

Flag

5 people liked this. Like ReplyReply

Vanna L 1 day agoin reply to Joshua Northey

"Essentially the same but quicker"? Inserting genes from another species of plant, or animal, is "essentially the same but quicker"? Are all science-huffers as stupid as this? No wonder there's a backlash!

Flag

3 people liked this. Like ReplyReply

Quis custodiet ipsos custodes 1 day agoin reply to Vanna L

Yes it is. Study some modern biology.

Flag

3 people liked this. Like ReplyReply

Kamana Kapu 2 days agoin reply to Joshua Northey

one of the best ways for us to increase the carrying capacity of the planet and reduce our environmental impact.
The very best way to 'reduce our environmental impact' is to drastically reduce the human population.

SUPPORT A WOMAN'S RIGHT TO CHOOSE!

Flag

3 people liked this. Like ReplyReply

gulfkraken 2 days agoin reply to Kamana Kapu

I look forward to you leading by example.

Flag

3 people liked this. Like ReplyReply

Ramakrishna Hosur 2 days ago

Agreed that we have been modifying our foods for thousands of years but with same set of naturally occurring genes,not some exotic gene from unrelated species.We jump the species barrier only to create unnatural and bizarre specimens.

Flag

7 people liked this. Like ReplyReply

Ulvskog 2 days agoin reply to Ramakrishna Hosur

Ever been bitten by a mosquito? How about another blood sucking insect? The truth is, genetic information jumps species all the time. Most of it doesn't have any effect though. Then there is the natural mutation rate. I sympathize with the desire not to walk into your local produce store and find a display of bananas with webbed feet, but there is reasonable and unreasonable risk assessment here. Gene Modified food as somehow dangerous is a low order risk. More people die of salmonella and contamination through food processing than are ever even remotely likely to be harmed by a modified crop.

Flag

13 people liked this. Like ReplyReply

Vanna L 1 day agoin reply to Ulvskog

GMO foods won't prevent this. It's a phony comparison.

Flag

1 person liked this. Like ReplyReply

Leslie Ann Diffin 1 day agoin reply to Vanna L

Intelligence will prevent this. And what's phony, is people that knowing continue to gorge themselves on chemically altered food, ever expanding their posterior and spewing misinformation to perpetuate the "we're so concerned and knowledgeable" rhetoric. What size are your pants, Toots? Do you actually get off them to do anything?

Flag

Like ReplyReply

gulfkraken 2 days agoin reply to Ramakrishna Hosur

"Agreed that we have been modifying our foods for thousands of years but with same set of naturally occurring genes." This is false.

You are ignoring naturally occurring mutations. These happen all the time through polymerase proofreading errors or environmental exposure.

Flag

3 people liked this. Like ReplyReply

Vanna L 1 day agoin reply to gulfkraken

Naturally occurring mutations are NOT the same as inserting genetic material from another species, or from an animal, into a plant's DNA. And you thickheads wonder why science isn't trusted, when you make specious arguments like this.

Flag

2 people liked this. Like ReplyReply

rick jones 2 days ago

Drift, but is the picture associated with this blog touching on modified food a modified image? Is it really possible to get those stitches into that piece of fruit with the straight needle shown rather than a curved needle?

Flag

4 people liked this. Like ReplyReply

vepxistqaosani 2 days ago

The Precautionary Principle clearly requires that we have to ban all foodstuffs that contain microRNA. And, of course, all foods made from substances that contain genes. Then we'll be safe.

Flag

12 people liked this. Like ReplyReply

El__Superbeasto 2 days ago

I think monsanto is generally right. Generic sequences used in fire gene insertions are modular. However, GM food vs non GM foods is an avenue of scientific that should be investigated just for the sake of expansion of human knowledge if nothing else.

Flag

4 people liked this. Like ReplyReply

Kamana Kapu 2 days ago

Hey, guy's! What about 'dislikes' received? Or how about switching to percentages? Like, 5% 'likes' received? And how about 'rebuttals', or 'arguments',? If you ain't got no talent at least show some class.

Beware of the Greedy One Percent (GOP)!

Flag

Like ReplyReply

ichirobot 2 days ago

The study showed that microRNAs from regular, unmodified rice can survive the mammalian digestive system, enter the circulatory system and affect gene expression in the host.

Mr. LeVaux's argument that genetically modified foods deserve greater scrutiny is a stretch, as they contain no additional microRNAs above and beyond the content of unmodified plants.

If Monsanto or any other company were to engineer a plant that expressed microRNAs that would downregulate my HMG-CoA reductase (cholesterol biosynthesis), I would gladly pay extra to eat it.

Flag

15 people liked this. Like ReplyReply

tstev 2 days ago

I must say that it is interesting. Some claim that viruses and bacteria causing DNA modifications as in some forms of cancers.

But I would be interested to know if the more carnivorous humans would act like cows, pigs and chickens they eat!

Flag

Like ReplyReply

DavidBN 2 days agoin reply to tstev

Have you been eating badger again?

Flag

Like ReplyReply

tstev 2 days agoin reply to DavidBN

LOL! I am a vegetarian you know. If you are a carnivore, you could have been more exposed to animal DNA. When I think about it most of badgers on Atlantic message board, they act as supporters of hunting and meat eating society so they could have been exposed to badger's DNA.

Flag

Like ReplyReply

ChristianGehman 2 days ago

Anyone who eats genetically modified food deserves what they get.
Monsanto -- the wonderful folks who brought you the napalm?

Flag

1 person liked this. Like ReplyReply

PaulGS 2 days ago

What is the "very real" danger? Can the author show us even one person made ill by GM products?

Junk science abounds and this article is typical of the alarmist babble peddled by the anti-corporate, fake science crowd.

Keep eating folks.

Flag

12 people liked this. Like ReplyReply

Joshua Northey 2 days agoin reply to PaulGS

He cannot. This is just the left's version of the Luddite anti-science hysteria you see from anti-evolutionists on the right.

"I object to this on moral grounds so I am going to make some crap up!"

Flag

10 people liked this. Like ReplyReply

PaulGS 2 days ago

Just watch how this thread attracts the anti-corporate, multinational-hostile, junk science food hysterics.

Flag

5 people liked this. Like ReplyReply

nightwater16 2 days ago

Yes, through selective breeding, we as humans have been changing the makeup of plants and animals for millennia. However, what many people fail to understand is that when speaking of modern genetic modification, there is nothing natural about it and would be impossible to replicate in nature whether accidentally or purposefully. It is more fitting to refer to these creations as transgenic or genetically engineered. Transgenic modification is about taking genes from a completely unrelated species and implanting them in another species. Cold water fish genes are now found in some strawberries to allow the berries to withstand frosts. Fish and berries don't combine like that in nature. Currently, most of the popular transgenic foods grown for the US market are engineered to be resistant to herbicides or pesticides. This means farmers can spray more of the herbicide on their herbicide resistant plants without killing the food crop, or spray less pesticide because a pest eating the plant will supposedly die. Unfortunately, this past growing season was a bad year for both these types of engineered plants. Those being sprayed with herbicide now have to contend with herbicide-resistant weeds, which means farmers have to spray more chemicals. Those farmers who thought they were done with pesticides have discovered after a few seasons that they spray anyway because Nature has created pesticide resistant insects. This is bad for the farmers' wallets, the environment, and we still have no idea what any genetically engineered food is doing to the people consuming them.

Flag

4 people liked this. Like ReplyReply

gulfkraken 2 days agoin reply to nightwater16

The next generation of resistance genes for rotating crops across the Midwest are going to have individual resistance genes for each species. In short, in even numbered years you plant corn and spray herbicide A; in odd numbered years you plan soy beans and spray with herbicide B. The upside is that there is no year over year selection to increase resistance to a single chemical, preventing resistance completely. Herbicide usage goes down and crop yields increase. and Large Agribusiness X gets to sell two chemicals instead of one. Everybody wins.

Also, is the name a take on "night soil?" If so, it is very funny.

Flag

1 person liked this. Like ReplyReply

Vanna L 1 day agoin reply to gulfkraken

You sound like one of those people hired at penny-a-post to tout the Monsanto propaganda. They do exist.

Flag

3 people liked this. Like ReplyReply

PaulGS 2 days ago

Next up from the junk science anti-corporate crowd: 'How Childhood Vaccinations Cause Autism'.

Oh wait, that was last week.

Flag

8 people liked this. Like ReplyReply

faircher56 2 days ago

I am now allergic to soy. I never was before and I think it being GM may have something to do with my allergy. (Just guessing)

Flag

Like ReplyReply

rick jones 1 day agoin reply to faircher56

You'll need to try to setup some sort of double-blind test where you ingest non-GM soy for a while, and then switch to GM and see if there is any difference. It is important though that you do not know which you are getting at the time.

Flag

3 people liked this. Like ReplyReply

blitz120 2 days ago

One should note, however, that ANY new genetic strain of a food source -- including those which occur "naturally" -- has precisely the same issues. In fact, given that the "natural" changes are wholly uncontrolled (unlike directed genetic modification), they have the potential to be a greater threat.

However, no one is arguing that every new crop strain undergo such testing. This is evidence that GMO crops are being evaluated under a double standard, and calls into question the motivation of those calling for GMO testing.

Flag

8 people liked this. Like ReplyReply

RontheEvilCanadian 2 days ago

"Our bodies are absorbing information, or DNA."

This statement is not congruous with the article. It is not DNA that is being "absorbed" but miRNA. The journal article states that the miRNA is taken up in its mature form, ie as RNA and not DNA. miRNA is non-coding for proteins and does not get reverse transcribed into DNA, so there is no way to say that this statement is factually correct.

(Edit: I see that the author has replaced "DNA" with "microRNA" in the lead-in. This is still wrong. microRNA is not genetic information. DNA is called "information" because it codes for RNA. Some RNA is called information as well because it codes for proteins. But miRNA is not that kind of RNA. As I say below, it is non-coding and is just as much "information" as a protein is.)

"It would mean that we're eating not just vitamins, protein, and fuel, but information as well."

No, it would not. miRNA is not "information". It doesn't code for anything. It works to regulate another form of RNA called mRNA, usually by degrading it when necessary. You're thinking of DNA or translationally active RNA.

Also, saying that miRNAs are "linked to Alzheimer's" is like saying that DNA is "linked to cancer". MUTANT miRNA is linked to Alzheimer's. miRNA itself is normal and present in every human.

And finally, why is a food writer writing about science?

(Edited by author 1 day ago)

Flag

19 people liked this. Like ReplyReply

mirnad 1 day agoin reply to RontheEvilCanadian

I love that food writers write about science!!! I think it's fantastic.

But he should have gotten someone to help him.

From the comments above it should be pretty obvious that we are all more than eager to explain science to anyone.

Flag

2 people liked this. Like ReplyReply

Emily Willingham 1 day ago

I've written a critique of the content of this article. Bottom line: The science is inadequately or incorrectly explained, and the stretch from "one plant miRNA causing one effect" to "real danger" regarding GMOs defies the abilities even of Elastigirl.
http://biologyfiles.fieldofsci...

Flag

19 people liked this. Like ReplyReply

mem_somerville 1 day agoin reply to Emily Willingham

Nice piece Emily.

Not that it probably matters to this author, but I had some issues with the original paper. There seemed to be some missing controls. How come there's so much in calf serum--do calf diets really contain that much rice? See also horse and sheep controls. Nothing is described about their diets.

And the putative binding to the far end of the transcript. Quite unusual, and hard to know if that's relevant in vivo at all. You can dump a lot of stuff in a cell culture situation that doesn't reflect what would be available to tissues.

Maybe there's something. But I think it would be wise to see another group replicate this before lighting one's hair on fire--and pouring lighter fluid on others.

Flag

5 people liked this. Like ReplyReply

Christoph Eicken 1 day agoin reply to Emily Willingham

Thank you Emily!
Highly recommended reading to everybody interested in the actual facts and science of the original publication - and potential implications.

Flag

1 person liked this. Like ReplyReply

ari levaux 1 day agoin reply to Emily Willingham

Your critique, and others like it, glossed over the main point of my article. The alarmist headline about "very real danger," which I had nothing to do with, didn't help. But your attitude and that of many other scientists critiquing this story is epitomized by this sentence in your critique:

"The article
goes on for several grafs about Monsanto and substantial
equivalence--indeed, the writer devotes a mere 180 words or so of 908 to
the study itself..."

You know why I spent more time discussing substantial equivalence than the Chinese article? Because that's what my story is about.

I used this interesting discovery on microRNA to point out a possible mechanism by
which GM DNA could impact our health in ways beyond what it codes for.
In light of this example, I discussed how outdated substantial
equivalence and Monsanto's stance against toxicity testing are.

Clearly, my presentation of the science has left lots of room for nitpicking. That's partly because I'm not a scientist and partly because I was attempting to explain things in simple terms. I would not have used the pizza analogy to explain the Central Dogma to scientists.

Anyway, none of the nitpickers - except the impressively level-headed mirna, have provided any useful response to my points that substantial equivalence is a transparent joke of an unproven hypothesis, and that Monsanto's stance against toxicity testing is based in business objectives, not scientific objectives.

Flag

5 people liked this. Like ReplyReply

Emily Willingham 1 day agoin reply to ari levaux

Your presentation of the science leaves not only a lot of room for "nitpicking" but also about an office building's worth of room for correction. If you are aware of your lack of knowledge, it would have been a good idea to have run your information by someone with greater insight and experience so that you could have avoided embarrassing yourself in this way. Because your science is faulty, your entire article collapses on the scientific premise on which you base it. That's not "glossing"; that's requiring accuracy in the cornerstone of your argument.

Flag

17 people liked this. Like ReplyReply

Ari LeVaux 1 day agoin reply to Emily Willingham

In other words, you still have no comment about my main points, even after I've explained them to you again?

I can't see how anything that you have pointed out changes my fundamental argument, which I'll state again:

The ability of plant microRNA to survive digestion and influence cell function point to a possible mechanism by which GM DNA could impact our health in ways beyond what it codes for. In light of revelations like this, substantial equivalence and Monsanto's stance against toxicity testing are outdated.

Flag

2 people liked this. Like ReplyReply

Karl Haro von Mogel 1 day agoin reply to Ari LeVaux

Ari, see my comment above about the nature of Micro RNA genes. Micro RNAs aren't generated willy-nilly from random DNA sequences, they have specific properties. In other words, Micro RNAs are coded for. This means that your statement that "GM DNA could impact our health in ways beyond what it codes for" is false. It would have been a really good idea to read and understand more about this topic before writing articles such as this.

Flag

10 people liked this. Like ReplyReply

mirnad 1 day agoin reply to Karl Haro von Mogel

I have a question for all the scientists on this thread.

I am going to assume that the paper from the Chinese paper is correct that miRNAs from food change the expression of human genes (obviously it might not be).

1) What if the genetic modification introduced was a knock down was to introduce a gene that produced a miRNA to knock down the expression of the gene in rice, as described in that PLOS paper I linked to way up there? Would that not have the potential to have off target effects in the person who consumed the rice?

http://www.plosone.org/article...

2) What about genetic modifications that use siRNA to knock down gene expression, like in these wheat strains? I think this is actually being used now.

http://www.greenpeace.org/aust...

I can't remember all of the mechanisms that make siRNA different from miRNA, but I think that it would produce a short RNA that could go across the digestive track like the miRNA in the study. I can't think of why it would be different than the miRNA.

Wouldn't there need to be additional testing beyond substantial equivalency to establish that these modifications are safe, if only to establish that the small RNAs introduced don't have the potential to bind to human mRNAs?

I think that the computational methods that would predict binding between a small RNA and the target aren't that great - we don't know where all the know human binding places are.

Wouldn't you need additional testing on this?

I am asking this as a question, not to make an argument.

Thank you in advance for your civil responses that will do a credit to intellectual discussions between science and lay audiences.

Flag

Like ReplyReply

Karl Haro von Mogel 22 hours agoin reply to mirnad

I'd be happy to respond to your question. (I won't bite your head off!)
Small Interfering RNAs (siRNAs) and Micro RNAs (miRNAs) involve very similar mechanisms, and some consider the distinction between the two to be artificial. However, they are a little different in where they come from (miRNA is produced by a gene in the organism, siRNA from double-stranded RNA that comes from outside the organism), and how they are used to silence, or turn off genes. (such as where they bind to, and how specifically they bind.) But for the purposes of this discussion we can probably treat them as the same, and expect that they behave similarly once generated.

The way that RNA Interference works, which results in the gene silencing, is it needs a match between the sequence of the miRNA and the sequence of the target gene. Unlike protein-protein binding which depends on the shape of the resulting protein which can be hard to predict, the binding of RNA to DNA is very straight-forward. The letters that form the code in DNA and RNA (ATGC, AUGC respectively) find each other and stick to each other. So what you can do to assess whether there are any potential off target effects - genes that you didn't intend to turn off, is compare the sequences. There are tools for this when it comes to designing RNAi constructs for genetic engineering. I'm not an expert on exactly how, but there are ways to optimize the gene you put together to make miRNAs so that it will be very specific to your gene of interest.

This kind of assessment is easy to do, and can be done before actually making the genetically engineered crop, and so researchers working on this should look for sequence matches not only in the target organism, but also the organisms that may consume it. For instance, there's an example that is not genetic engineering that illustrates the same concept. There is a company called Beeologics (www.beeologics.com) that is developing an RNAi-based method of treating honeybee diseases and parasites of honeybees. Rather than doing genetic engineering, they just make the little RNA molecules and put it in the sugar syrup fed to the bees in spring and fall. It gets absorbed and silences the genes of viruses, and has even been shown to silence a target gene in the Varroa mite that feeds on the blood of honeybees. It's pretty fantastic stuff from the sound of it, and that's why this rice micro RNA paper is not news when it comes to the idea of micro RNAs in food affecting your genes. What the Bee researchers want to do is find an important gene in Varroa mites that is not present in honeybees, and optimize their small RNAs to target the Varroa gene and not anything in the bees - thereby harming the mite and not its host. That's what should be done with RNA

The links you provide are two good examples for discussion. The first one shows how specific RNAi is, and since it is open access it is available for everyone to read without forking over money. Everyone interested in this topic should try reading at least a little of it, such as the introduction, and the discussion.

The second one is a great example of Greenpeace's dishonesty on genetic engineering at work. Back in the summer, I covered how Greenpeace wrote a plagiarized "independent scientists letter" that was sent to CSIRO right before they broke into CSIRO's facility to destroy their wheat experiments. http://www.biofortified.org/20... They mangled the science in that letter as well as in this "technical briefing." Take a look at item #3: Effects of dsRNA on nontarget RNA. They cite a study in support of their claim that specificity of RNAi is low. http://www.ncbi.nlm.nih.gov/pu... For one thing, the study

in question was done on human cells, not zebrafish as they claim. Second, they claim that this study demonstrated that "This indicated that the GM RNAi constructs could silence
other genes in addition to the target gene, known as off-target effects." Although you wouldn't be able to read the paper because it is behind a paywall, they put their conclusion right up in the abstract: "These results indicate that siRNA is a highly specific tool for targeted gene knockdown". The discussion in the paper notes the following:"The optimized siRNA design rules and transfection conditionswere used to generate gene expression signatures for multiplesiRNAs directed against different regions of the same target. Theseexperiments were performed for a total of three targets. Our dataindicate a very close qualitative and quantitative correlation betweenthe expression signatures for multiple siRNAs against thesame gene. This correlation implies that, under the optimizedconditions, the effects of siRNA are limited to specific targetknockdown, and suggests that, when properly designed and used,siRNA does not undergo cross-hybridization. Our data also indicatethat siRNA does not appear to interact with cellular proteins."The paper did show that when to ramp up the production of small RNAs really high, you get some of the cell's stress response genes turning on, which sounds like the cell thinks that it is getting attacked by viruses - one of the primary roles for RNAi is defense against viruses. It seems that Greenpeace read what it wanted to when reading this study. Since the amount of small RNAs that you could absorb from your food is low (they degrade quickly), then you would only have low concentrations present if you ever absorbed it. Therefore, you couldn't have the kind of effect that they are worried about.I'm glad you provided that link, because I noticed they made a false claim about Golden Rice, and provided their reference. Finally I know where the misappropriated claim that golden rice behaved unexpectedly came from. Much thanks on that!In summary, RNAi, when done properly, can be highly specific to a target gene, and virtually harmless to organisms that do not possess similar genes. The CSIRO wheat was silencing starch synthases, and they noted (in the paragraphs about gene silencing that Greenpeace cited) that they looked to see if their RNAi construct silenced a similar starch synthesis gene that had some sequence similarity, and it didn't. Humans don't have starch synthesis genes, and it would be a fairly easy task for a geneticist to show whether the sequnce used in CSIRO's wheat could even remotely affect us. Substantial equivalence is one part of the regulation of GE crops, and the CSIRO wheat is one example that is not substantially equivalent - the purpose is to change the composition of the starch in the grain. Even so, there are tests that are done on the genes used in GE crops for allergenicity, cross-reactivity, and unexpected effects that go beyond merely checking for equivalence in the composition of the resulting crop.I hope this helps!

Flag

7 people liked this. Like ReplyReply

diya_again 1 hour agoin reply to Karl Haro von Mogel

Thank you so much for taking the time to explain in a non-combative way. Scientists need to try to avoid being defensive about these issues, despite the fact that the science itself is under attack. People's fears are real, if the substance of their arguments lacks a specific target. I think a lot of folks are operating on a kind of intuitive sense that messing with nature is bad. But nature messes with nature all the time.

Anyway, it takes a lot of time to explain science and it's a lot harder than just insulting someone whose views you don't like. Thanks again for your effort!

Flag

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Karl Haro von Mogel 1 day agoin reply to ari levaux

Emily has written an excellent takedown of the Micro RNA claims of this article, and it pains me to see how quickly Ari Levaux dismisses it. Ari was using the research as a springboard to trying to criticize the regulation of genetically engineered crops, however it was ill-suited to that purpose.
This is not a nit-pick - it is a refutation of your central claims about dangers. Disowning the title does not change the content of your article where you claim "dangerous implications" etc. On your claim about the inert properties of DNA in and of itself, "The Chinese RNA study threatens to blast a major hole in that claim" is false. Each argument about substantial equivalence falls back on claims you make based on this paper. So without it, you don't have an argument. To say that Emily glossed over the main point of the article is to ignore what is central to your article.
You ignore the context of plant genetics in this post, and gloss over the fact that the many thousands of micro RNAs produced by the plants we already eat have a much greater likelihood of having a potential effect on human health than a couple transgenes that don't produce micro RNAs. There are indeed implications of this research when it comes to engineering micro RNA genes (RNAi), and the new research does not change conventional wisdom that the products of this RNAi process should be evaluated for potential activity in humans.
Transgenes are not treated by the cell or by Micro RNA machinery any differently than native genes. In order to produce a Micro RNA, a gene needs to have specific properties, including introns, inverted repeats, and/or flanking sequences that lead to efficient RNA processing to generate the micro RNAs. Current transgenes do not have these necessary sequences, so they will not generate micro RNAs.
Your treatment of Substantial Equivalence is simplistic and you don't indicate that you understand precisely what is meant by it, and why it was developed. There is a perception amongst anti-GE individuals that it is some sort of way of avoiding testing, when in fact it is a way to determine if there is a biochemical or nutritional change that falls outside the natural range of variation, which would suggest further testing. It is not an assumption of equivalency, but a determination that is reached only after testing has occurred. It doesn't preclude further testing, nor is it a claim that there is no possible side effects from genetic engineering. Genes exist in a connected network of activity, and any change, including by mere breeding, can have effects on that system. Substantial equivalence is in fact a recognition of this fact that a genetically engineered trait can significantly affect this system, and if it does, further scrutiny is advised. Anastasis Bodnar has written a post about substantial equilvalence that is very informative:
http://www.biofortified.org/20...
It is strange how Ari Levaux makes claims about (non) dangerous genetically engineered foods, while ignoring the VERY REAL dangers of raw unpasteurized milk consumption.
http://www.theatlantic.com/hea... If there was a single person whose health was harmed by a GMO, Ari Levaux would probably call for the complete banning of GMOs. But while raw milk continues to make people sick, it's "food freedom." Wait, what? This contradiction expressed by many well-to-do,

white foodies who live in developed nations always confuses me.
(The irony that I am a light-at-the-end-of-the-tunnel-grad-student, white, and into food and living in a developed nation does not escape me. But I am aware of it. I just wanted to express how I find this sort of statement about race and socioeconomics from Ari Levaux to be rather odd, considering he falls in that category himself.)
Finally, knowing that there is a micro RNA that was newly discovered in rice that affects the regulation of a human health-related gene with unknown consequences, does that mean that Ari Levaux will no longer eat rice? That would be a true test of whether or not he accepts his own worry about the risks of micro RNAs.

Flag

17 people liked this. Like ReplyReply

vepxistqaosani 22 hours agoin reply to ari levaux

Yes, yes, yes! We're all going to die because of the greed of the corporations. That's why human life expectancy has been decreasing all over the globe for the past century.

Oh, wait ... what?

Flag

2 people liked this. Like ReplyReply

mick236 1 day ago

isnt the burden of proof on monsanto?
ie i dont have to prove the food is healthy- they have to prove it isnt harmful. yea?

Flag

2 people liked this. Like ReplyReply

vepxistqaosani 1 day agoin reply to mick236

Since it's logically impossible to prove a negative, Monsanto would have to ditch GM foods entirely.

In fact, everyone would have to stop everything, since there isn't anything in the universe that's been proven not harmful. Even air and water can kill ....

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BanjoBuxby 1 day agoin reply to vepxistqaosani

so you can't prove the statement "4 is not an odd number" ?

Flag

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molten_tofu 23 hours agoin reply to BanjoBuxby

Actually, dude, that's a really hard thing to prove.

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disqusplaya 1 day ago

What would you choose:
1) Growing genetically modified food
2) Dumping insane amounts of petroleum-based products and poisons on our land and crops
3) People starving to death

Because really thats the choice we are facing with 10 billion people on the planet.

The implied choice of anti-GMO alarmists seems to be #3, and personally I find that offensive.

Flag

9 people liked this. Like ReplyReply

Miranda Mickiewicz 3 hours agoin reply to disqusplaya

Actually, there is another choice.

A report from the Post-Carbon Institute demonstrated that organic, biodynamic agricultural systems actually produce MORE food per acre than conventional industrial farming, and have a much lesser impact on environmental and human health and climate change.

In short, organic, biodynamic systems require fewer outside inputs (removing need for petroleum-based fertilizers and pesticides), improve soil health (retaining nutrients and preventing nitrification downstream), result in much more biodiverse agricultural ecosystems (good for pollinators, soil aerators, and a host of other "good" animals), and, in the long run, are actually more cost-effective because of the increased yield and quality of the crops.

(View the report here http://www.postcarbon.org/repo...

Yes, it may require more human-power, but when unemployment is at an all-time high, is that such a bad thing?

Another thing, there hasn't been any success thus far in GMO crops that produce higher yield. So far, they've mostly been associated with their manufacturer's pesticide/herbicide, providing a high profit margin to the Monsantos of the world, but doing nothing to alleviate the very real food crisis you allude to. Do we really want our farmers going into debt to buy expensive seeds that require expensive, harmful chemicals, and can't even be saved and sown the next year?

Furthermore, in a recent article published in both Scientific American and Nature (http://www.scientificamerican...., Jonathan A. Foley suggests five ways we can "feed the world and sustain the planet." Check it out for some real talk about what is actually required to feed the world for a long time to come.

So cheer up! Turns out, plants LIKE to grow. If we work with the earth instead of against it, it's healthier for us and the planet.

Flag

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Antiehypocrite 1 day ago

Monsanto is the DEVIL.

They told us:

DDT was safe: http://en.wikipedia.org/wiki/M...

Agent Orange was safe http://en.wikipedia.org/wiki/A...

PCB's were safe http://www.washingtonpost.com/...

Such corporations are destroying the planet.

I for one, am hoping that we have a cataclysmic economic disaster ASAP. Because that is the only

possible we hope to save this world.

If we don't we will continue to poison ourselves, we will continue to tear every last bit of coal, oil and gas out of the earth until we are breathe so much mercury and other pollutants that we go brain dead - we will kill every single last fish in the ocean until we collapse that entire ecosystem... we will burn up our atmosphere until the only habitable places that remain are in the far north

We need a major reset here. It won't be nice but it is necessary - for our survival.

Hopefully America can elect another George W Bush type, hopefully we can get more corruption in governments around the world, we NEED this economic calamity to worsen and slay the beasts that are destroying our environment.

Flag

3 people liked this. Like ReplyReply

PaulGS 1 day agoin reply to Antiehypocrite

Snore.

Flag

2 people liked this. Like ReplyReply

Mike Hyland 1 day agoin reply to Antiehypocrite

Do you actually believe the tripe coming from your keyboard and the left side of your brain?

Flag

3 people liked this. Like ReplyReply

Antiehypocrite 22 hours agoin reply to Mike Hyland

I dunno. But I like it when your mother talks dirty to me though.

Flag

1 person liked this. Like ReplyReply

Jim Lippard 1 day ago

Non-GM foods are also artificially altered, through mechanisms like hybridization--how do we know that the genetic changes from artificial selection and breeding programs are safer than those specific targeted changes made in GM foods?

Flag

3 people liked this. Like ReplyReply

Antiehypocrite 1 day agoin reply to Jim Lippard

http://topdocumentaryfilms.com...

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PeterPisum 1 day ago

Why don't they require journalists who comment on science to have a basic, just a basic, understanding of modern science? MicroRNAs are en extremely common regulatory element of genetic control in all organisms, and, if some get taken up, then micro RNAs from all the foods you have ever eaten are similarly taken up and have been for hundreds of millions of years. GM foods just have genes precisely placed versus more random gene selection in crop breeding that has been going on for thousands of years.
However, as my colleague says, they will require journalists to have some understanding of science when we engineer pigs to fly!
(FYI: I am a plant scientist with no ties to industry.)

Flag

10 people liked this. Like ReplyReply

Laurel Sayler 1 day agoin reply to PeterPisum

There is a vast difference between cross-pollination or grafting between two different plants to create something new and inserting scorpion DNA into a plants genetics so it is insect resistant and if you can't see that then you should find a different profession.

Flag

3 people liked this. Like ReplyReply

Vanna L 1 day agoin reply to Laurel Sayler

Exactly. Except that I think the "profession" of most of these Monsanto-huffers is in the marketing department of Monsanto, not any science lab. Although they may have been Assistant Professors of Biology at some ditchwater college before the money was thrown at them.

Flag

2 people liked this. Like ReplyReply

DavidBN 20 hours agoin reply to Vanna L

As opposed to food columnists, who are apparently eminently qualified to comment on cutting edge genetic research?

Flag

2 people liked this. Like ReplyReply

Jim Lippard 1 day agoin reply to Laurel Sayler

Are you asserting that artificial selection and natural selection can't produce new characteristics that are harmful in food (including toxic chemicals for insect resistance)?

Flag

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Jason 23 hours agoin reply to Laurel Sayler

Ah Laurel, I think Peter and Jim are referring to the common modern breeding techniques such as mutagenesis, embryo rescue, and hydridistion, among others. These methods - as I mentioned in an above post - definitely scramble and cause unpredictable disruptions to the DNA and genes in plants. They can introduce unknown and often undesirable genes and these events would rarely, if ever, be able to occur naturally. There is no testing on these conventionally-bred crops so they can be released onto the market without us having a clue if the crop suddenly has a new gene that expresses a toxin or allergen. We don't know if an existing and naturally occurring gene has been mutated so that it is over regulating and producing excess toxin or allergen. These are conventional,

non-GM breeding technologies and most of your fruits, vegetables and cereals have been bred by one of these methods somewhere through their generations. So are they safe? How does one define safe? And what do we mean by natural and is unnatural always bad?
Jason, TechNyou, University of Melbourne

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2 people liked this. Like ReplyReply

Antiehypocrite 1 day ago

Great Documentary - The World According to Monsanto (The Devil)

http://topdocumentaryfilms.com...

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Phillip Garland 1 day ago

There's a basic error in the second sentence of this piece. LeVaux writes: "The Nanjing University-based team showed that this genetic material will bind to proteins in human liver cells and influence the uptake of
cholesterol from the blood."

microRNA (miRNA) does not bind to proteins. It binds to messenger RNA (mRNA). The linked journal article mentions this fact both in the abstract ("Functional studies in vitro and in vivo demonstrated that MIR168a could bind to the human/mouse low-density lipoprotein receptor adapter protein 1 (LDLRAP1) mRNA") and in the very first sentence of the introduction ("MicroRNAs (miRNAs), a class of 19-24 nucleotide long non-coding RNAs derived from hairpin precursors, mediate the post-transcriptional silencing of an estimated 30% of protein-coding genes in mammals by pairing with complementary sites in the 3′ untranslated regions (UTRs) of target genes").

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5 people liked this. Like ReplyReply

tehixe 1 day agoin reply to Phillip Garland

Journalists don't have any expertise in the things they cover. They think that ignorance is the same as objectivity.

Flag

1 person liked this. Like ReplyReply

Phillip Garland 1 day agoin reply to tehixe

If a journalist doesn't have expertise in a subject they write about, it's reasonable to expect that they, or their editor, will run the piece past someone who is knowledgeable about the field, especially when the article relates to human health.

In this case, the Atlantic seems to have run an alarmist piece about microRNA and human health, when the author is apparently unfamiliar with even the most basic fact about microRNA.

Flag

2 people liked this. Like ReplyReply

DavidBN 3 hours agoin reply to Phillip Garland

The editor-in-chief or whatever is a yuppie foodie who tends to turn a blind eye to this sort of thing. As with the perpetual bombardment by Richard Florida's statistical nonsense, this is just something that you have to learn to tolerate if you're going to keep reading the magazine/website. It's not exactly in it's Ralph Waldo Emerson heday anymore.

Flag

Like ReplyReply

microRNA 1 day ago

for a scientific analysis: http://www.nature.com/cr/journ...

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3 people liked this. Like ReplyReply

Ricardo Früstöckl 1 day ago

Do you think this is a coincidences?
http://www.darkgovernment.com/...

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Like ReplyReply

ruoft 1 day ago

This article is complete crack science. MicroRNAs are encoded by genes, just like "normal DNA genes". All cells have TONS of microRNAs (aka...all the plants you eat contain microRNAs, genetically modified or not). These RNAs can't kill you or reprogram your body, anymore than eating too many carrots will turn you into a carrot. The pizza analogy is not only stupid, it is completely wrong and scientifically unsound. I hate how this GMO debate just preys on peoples' limited understanding of molecular biology in order to induce fear of something the general public doesn't understand.

Flag

8 people liked this. Like ReplyReply

BanjoBuxby 1 day ago

rice is nice, but - it'd be amusing if it turns out rice has been playing us for fools all along, and has co-evolved to suppress some protein that's directly, or indirectly involved in human cognition, and that makes us want to think we want to carefully cultivate it in preference to other plants. bit like some fungi that control the behaviors of the wasps they infect.

Flag

4 people liked this. Like ReplyReply

molten_tofu 23 hours agoin reply to BanjoBuxby

This is also clearly the reason nobody I know likes tofu.

Flag

Like ReplyReply

dodanimal 1 day ago

The insertion of powerful DNA expression promoters and proteins that are very different from those occurring naturally in plants can have dangerous, unintended and unanticipated consequences. Some plants

produce toxic chemicals and may even produce harmful proteins or peptides. It is arrogant and unscientific in the extreme to assume that all possible combinations of DNA, proteins and biochemistry is safe for everybody to consume in large quantities for a lifetime.

There is a good example of genetic engineering gone wrong: the tryptophan tragedy of the 1980s. The tryptophan was produced by genetically engineered bacteria, and the problem started when the bacterial genome was altered a second time to increase tryptophan production. An unexpected accident was that this also caused the bacteria to produce an unknown toxic chemical that was chemically similar to tryptophan and was not removed by purification. No safety testing was done because of this "substantical equivalence" nonsense. People died and many were permanently disabled by the contaminated tryptophan.

So today we have untraceable and unlabeled GMOs infiltrating the food supply. Nobody knows their exposure and you cant even find out. There is no way for consumers to determine if GMOs may be causing chronic, subtle health problems. The FDA isnt doing any research or monitoring the situation.

The FDA declared GMOs safe based on a hypothesis that was pulled from thin air back in the 1990s, and still has never been teested. Thats not scientific. Thats corruption.

Flag

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Me1anieLynn 1 day agoin reply to dodanimal

"It is arrogant and unscientific in the extreme to assume that all possible combinations of DNA, proteins and biochemistry is safe for everybody to consume in large quantities for a lifetime."

"The FDA declared GMOs safe based on a hypothesis that was PULLED FROM THIN AIR back in the 1990s, and still has NEVER BEEN TESTED. That's not scientific. That's corruption."

"Today we have UNTRACEABLE and UNLABELLED GMOs infiltrating the food supply. Nobody knows their exposure and you can't even find out. There is no way for consumers to determine if GMOs may be causing chronic, SUBTLE health problems. The FDA isn't doing any research or monitoring the situation."

Incredibly well said. Thank you for your input in the discussion, I find your comments refreshing.

Your example of the tryptophan case is extremely relevant. Thanks for reminding us! Such cases are quickly hidden. Those who trust the FDA (or other government agencies) must be unaware of who they really serve (i.e. big business that put profits before people).

"People died and many were permanently disabled".
Let that be a severe and urgent warning to us all. This is a global issue deserving attention.

I think we should all be planting some of our own food at home (GO BIODOMES!) to reduce our reliance on GMO and ease the strain on the global food supply chain. Every little bit helps. It also reduces carbon emissions because my tomatoes (eg) are not being imported from Mexico or further. Everyone can make time for this, if it's important to them. (I also went vegetarian to help reduce my impact and I've never felt better.)

I am wondering if this article I read a few days ago relates to the debate here; it shows that bugs are becoming resistant to the GMO corn: http://news.yahoo.com/bugs-may... despite Monsanto's attempts to curb this (by insisting farmers change crops and mix seeds - which many farmers are not doing because corn is paying so well right now).

Does the bug resistance have any relation to the issues being discussed here? I'm concerned about this colony collapse disorder, as bees are integral to our crop pollenation, whether those crops are GMO or nonGMO...

Flag

Like ReplyReply

molten_tofu 23 hours agoin reply to Me1anieLynn

I'm reminded of the time I watched the first X Files movie with my dad, who is a plant biologist. When they let the alien/mutant bees loose to pollinate the corn... the look on his face was priceless. Obviously, I had no idea what was going on.

Flag

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charlesfrith 1 day ago

Monsanto buys Blackwater.

http://www.reddit.com/r/conspi...

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David Blum 1 day ago

It's difficult as a lay person to sift through the two positions: those who support GM foods like Monsanto have a monetary interest in opposing research into their safety. Those who oppose GM foods, like people who support organic, sustainable farming (and I do), seem to do based on moral and ethical grounds than on science.

But if you're going to regulate something, you should do so based on science and objective fact, not on moral inclinations.

The only solution I can see is extensive research by neutral parties.

Flag

6 people liked this. Like ReplyReply

AtlanticMM 26 minutes agoin reply to David Blum

What is extensive and to what degree of confidence do you test to? As you test further and further it cost exponentially more to go from say 96% to 97% confidence than it does to go from say 40% to 60%. How long do you block cheaper and more productive food before giving it the go ahead. It has to be somewhere before the 100% answer because you will NOT get there. Ever.

Flag

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Jessica Armatis 1 day ago

The link for "Central Dogma" PDF is not working.

Flag

Like ReplyReply

Stikaeric 1 day ago

Micro RNA is in every living thing. This is a joke.

Flag

Like ReplyReply

Barry Barclay 1 day ago

Of course there should be ongoing testing but humans have been consuming rice for many thousands of years and have micro RNAs in our bodies for a very long time without ill effect. Why should they become hazardous now all of a sudden. I am no friend of Monsanto but the hysteria surrounding GMOs is misplaced and simplistic. GMOs can have enormous benefits both in medicine and industry along with potential and as yet unproven hazards.

Flag

2 people liked this. Like ReplyReply

Organicalltheway 1 day ago

All I want to know is, if Monsanto's nasty GMO's are SOOOO safe, why do they pay billions of dollars to make sure that their products are not labeled? I wouldn't even feed that nasty stuff to a Pet Republican!

Flag

1 person liked this. Like ReplyReply

AtlanticMM 31 minutes agoin reply to Organicalltheway

Cost and perception and speculation.

Flag

Like ReplyReply

19chris62 1 day ago

There are alot of assumptions in much of the postings here; the reality of the situation (and has been borne out with centuries of practical experience in nature) is that genetic mutations rarely occur in adaptations or survive. The majority of genetic mutations/replications that aren't 'programmed' or expected by the species chromosomes are rejected. Mechanisms of protection and elimination exist and function constantly.

Flag

Like ReplyReply

bcainw 1 day ago

Ridding the globe of GMO plants will be at the top of my agenda:

New Candidate for 2012 Presidency wants a "Green Economy" Based on Marijuana

http://www.newagecitizen.com/M...

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Like ReplyReply

romancohen 1 day ago

Still have questions abut food biotechnology? The IFIC Foundation has resources. This is but one: http://www.foodinsight.org/Res...

Flag

Like ReplyReply

Charles Barry 1 day ago

Could someone explain to me how microRNA could cause genetically modified food to be bad for you but not normal 'organic' food? Both contain DNA, RNA and microRNA.

The opening reference to an article by Chinese researchers doesn't appear to be about genetically modified rice but bog-standard normal rice....

Flag

2 people liked this. Like ReplyReply

Me1anieLynn 1 day agoin reply to Charles Barry

I'm not a scientist, but I've been trying to piece the puzzle together; I have actually learned more from the first page of comments on this article than the article itself. You may want to check them out. Great debate!

As I understand it, the miRNA from the GMO crops is suggested as being 'dangerous' because

1) we are eating the miRNA when we consume the foods; then, normal digestion and cooking processes do nothing to 'eliminate' the miRNA so it makes it's way into our blood/cells and MAY cause our genetic material to start coding for things it didn't code for previously (GMOs cause specific concern because the plant miRNA entering our bodies may never have gotten there through natural evolution - e.g. BT Corn (GMO) adds a poison/toxin from a bug to help crops survive with fewer pesticides - would we ever eat that bug in large quantities normally? Unlikely). Then, the changes suggested by the foreign miRNA to our normal genetic code could be happening without us even being aware that this is happening within us. Changes could be big or small, no one knows because almost no research has been done. Some are saying this is very bad, others are saying it happens all the time in nature anyway. No way to be sure without evidence from independent research.

2) Because genetically modifying any organism COULD have unintended and unexpected results, there is no way to understand how these genetic modifications could affect us humans, UNLESS RESEARCH IS DONE! (Monsanto says research in humans is unnecessary which makes me wildly suspicious!!! That's spells putting profits before people in big bold letters.)

Here's what the research paper discussed in "Nature" state (which I feel adds credit to the NON-GMO side:
"In the recent paper by Zhang et al. 12 in Cell Research, cloning and sequencing of small RNAs in human serum revealed that plant miRNAs represented about 5% of mammalian miRNAs. Plant miRNAs are 2′-O-methyl modified at their 3′ end, which renders them resistant to periodate, whereas human miRNAs have free 2′ and 3′ hydroxyl, which
renders them sensitive to periodate. The plant miRNAs cloned from human serum were resistant to periodate, indicating that they are genuine plant miRNAs, probably coming from the food intake. Confirming this hypothesis, the concentration of plant miRNAs was higher in the serum of rice-fed mice compared with chow diet-fed mice. Moreover, adding plant miRNAs to chow diet resulted in an increase of plant miRNA concentration
in mouse serum. Interestingly, cooking did not impair the accumulation of plant miRNAs, indicating that they are resistant to heat and thus could be acquired from both raw and cooked meals." from: http://www.nature.com/cr/journ...

This article is saying plant miRNA can and does get into the human genome.

Thus, we need to definitively determine whether GMO crops can affect humans in detrimental ways.

Research by independent parties is essential! How can we ensure this happens?

Flag

1 person liked this. Like ReplyReply

mirnad 23 hours agoin reply to Me1anieLynn

"MAY cause our genetic material to start coding for things it didn't code for previously"

No, the idea is that the exogenous miRNAs could accidentally shut off genes that should be on. You wouldn't get anything new.

Flag

1 person liked this. Like ReplyReply

Karl Haro von Mogel 1 day ago

Ari, see my comment above about the nature of Micro RNA genes. Micro RNAs aren't generated willy-nilly from random DNA sequences, they have specific properties. In other words, Micro RNAs are coded for. This means that your statement that "GM DNA could impact our health in ways beyond what it codes for" is false. It would have been a really good idea to read and understand more about this topic before writing articles such as this.

Flag

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christinerogers2012 1 day ago

This is very interesting. The RNA profiles of GM foods needs to be independently analysed to understand the full implications. There is another nice summary of this report on another website (Institute of Science in Society) if anyone is interested:

http://www.i-sis.org.uk/How_Fo...

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georgehollister 1 day ago

It is equally possible that microRNA in any food could be absorbed and incorporated. Why the exclusive concern for GM food?

Flag

2 people liked this. Like ReplyReply

Karl Haro von Mogel 1 day agoin reply to georgehollister

Exactly. Does Ari Levaux eat rice now that he knows there is a Micro RNA with potential health consequences produced in the grain that gets into our bodies? Inquiring minds want to know! :)

Flag

1 person liked this. Like ReplyReply

diya_again 1 day ago

We are all GMOs!

Researchers have identified about 100,000 bits of human DNA that likely came from viruses. Every cell in the human body contains remnants of an ancient bacterium. And "traditional" plant breeding practices cause genetic mayhem in the cell that "could be" dangerous. Imagined dangers are impossible to refute.

Flag

1 person liked this. Like ReplyReply

diya_again 1 day ago

We are all GMOs!

Researchers have discovered 100,000 bits of human DNA that likely came from viruses. Every human cell contains the remnants of bacteria, each with its own DNA (mitochondria).

Also, "traditional" plant breeding practices create mayhem in cells, introducing numerous new genes as well as mutations that "could be" dangerous. Those who introduce new genes into plants the lab do so much more precisely.

An imagined threat is always scarier than an actual risk and nearly impossible to refute.

Flag

1 person liked this. Like ReplyReply

molten_tofu 1 day ago

I swear I'm not a Monsanto PR troll, but this article is fridge sauce. It may very well be true, but there are basically no substantive relationships between the facts and too many little red flags signaling recently digested information on the part of the author.

It would take 5 additional explanatory sentences between the first two of the article to establish this as a serious piece of investigative journalism. Additionally, I wonder at the plural "MicroRNAs". Perhaps a better editor is what's needed.

Then again, the Atlantic hired Joshua Foust. I think I just outed myself...

Flag

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doctorstev 1 day ago

Firstly, I agree with you that safety should be a priority and more testing and regulations should be enacted.

Big problem with your article though. miRNA is not "information". In fact, ingesting foreign miRNA is not much different that ingesting foreign vitamins or proteins. Furthermore the extremely low chance of a miRNA falling into an inserted GMO gene makes the risk negligible. The environment likely plays a larger impact on miRNAs in plants. For example miRNA393 is dramatically increased in plants exposed to the cold. So a crop of plants that may be exposed to a extremely cold season would likely have excessive amounts of miRNA393 in it. Therefore the miRNA study you cite has not uncovered a great new threat from GMOs as you imply. So while I believe your conclusion may be valid
(in that new strains of foods should be extensively tested) your reasoning is faulty.

Flag

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molten_tofu 1 day agoin reply to doctorstev

Sorry, miRNA is not a maximally entropic state of the universe :)

Flag

2 people liked this. Like ReplyReply

Andrew Kantor 1 day ago

"Why don't they require journalists who comment on science to have a basic, just a basic, understanding of modern science?"

Um... _they_ who? And by require, do you mean "require to be licensed"? If so, by whom?

Flag

1 person liked this. Like ReplyReply

Michael Prigge 1 day agoin reply to Andrew Kantor

Maybe not licensing, but I'd like to expect that "science" pieces written by people lacking junior-high-level understanding of science would be rare due to the publisher caring about its credibility.

Flag

1 person liked this. Like ReplyReply

REGREEN 1 day ago

There is no "real" danger documented in this article. Imagined, yes. Not real. Whatever presence of microRNA the researcher has discovered we must assume has been a function of the human organism for centuries. It would seem that we've been carrying this xenobiotic "information" in our bodies for generations. Why would a snippet of RNA derived originally from some organism that was likely, intentionally or not, ingested for years be more threatening simply because it has been ingested as a part of a macromolecule incorporated into a different foodstuff? There is no suggestion of the mechanism by which the microRNA acts - in fact not even an assertion from the researcher that it does act at all - only that it is there.

Saying that the article presents evidence of real danger from genetically modified foods is a gross overstatement of anything that's reported. (I haven't read the original article; maybe it was poorly reported.)

Flag

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Joey Autuoro 1 day ago

this article is very poorly written, and insufficiently researched... the pizza metaphor is absolute garbage... and EVERYTHING is linked to cancer, Alzheimers and diabetes nowadays -- which only dilutes those claims... and furthermore, microRNAs are responsible for regulating all aspects of life -- so they are extremely important molecules, and this article TOTALLY misconstrues things by painting microRNAs to be bad players.

the author of this article should be punched in the face. people who don't know biology should not be writing articles about it and spreading their ignorance... the GMO debate is approaching ridiculousness because most people still have no idea how DNA works.

Flag

1 person liked this. Like ReplyReply

Millo Magnocavallo 1 day ago

Has anyone ever seen 'What in the world are they spraying'? Making plants suppress their natural defenses so that they blindly keep taking up and absorbing heavy metals such as Aluminium and Barium from the soil and specifically designed this way so that they can continue growing in spite of these toxins (that would kill most other plants growing in the same soil) is wrong, and evil. You just got to see the big picture.

Flag

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malowsky 1 day ago

a rose is a rose is a rose? no it ain't anymore

Flag

Like ReplyReply

malowsky 1 day ago

a rose is a rose is a rose? no it ain't anymore

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Tore B. Krudtaa 1 day ago

THE GMO EMPEROR HAS NO CLOTHES
A Global Citizens Report on the State of GMOs
Dedicated to the peasants of India who led the first movement of freedom 150 years ago and are rising once again to A global citizens report that documents the false promises and failed genetic engineering technologies in agriculture.
Download the report here:
http://navdanya.org/attachment...

Dr. Huber on how Glyphosate and GMO destroy soil quality - affecting health of plants, animals and humans:
http://www.monsanto.no/index.p...

GMO eggplant confirmed to be toxic:
http://www.monsanto.no/index.p...

GMO Bt cotton linked to livestock deaths in India?:
http://www.monsanto.no/index.p...

Monsanto's herbicide Roundup linked to birth defects in Argentina's agricultural areas?:
http://www.monsanto.no/index.p...

GMO news:
http://www.monsanto.no/index.p...

GMO video's:
http://www.monsanto.no/index.p...

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david ropeik 1 day ago

What woefully inadequate journalism. To understand whether there is any risk here, as the story strongly implies, requires far more than fretting about the peril of eating 'information'. Good gracious, we eat biologically active substances all the time that interact with everything from our DNA all the way up to whole organs.
I study and write about the psychology of the way we perceive risk. This essay is a clarion example of the subjective nature of risk perception. GMOs trigger unique fears for several specific affective reasons. They are;
- MAN-MADE,
- IMPOSED on us by self-interested organizations (ergo the concentration on evil Monsanto, when

there are hundreds of companies involved in genetic modification),
- hard to understand leading to UNCERTAINTY,
- the technological products of a free market where power resides with a few, which is culturally offensive to those who favor a more egalitarian society, who as a result are particularly worried about/hostile to many forms of modern technology. (This work comes from the Theory of Cultural Cognition (http://www.culturalcognition.n...)

This piece plays up those psychologi8cal characteristics and magnifies public apprehension about a technology based more on emotion than a thorough report about the actual risk. The Chinese study is a good story, but this report about it belongs on the Greenpeace website, not on the Atlantic, which should be ashamed for running it.

Flag

5 people liked this. Like ReplyReply

molten_tofu 23 hours agoin reply to david ropeik

You were totally good up to the last sentence, when you couldn't resist the Greenpeace swipe. Now I couldn't care less about your effective reasoning and just kind of think you're annoying. Even though I agree with you.

Flag

1 person liked this. Like ReplyReply

dom legras 23 hours ago

Recently (sort of anyway) in Australia Greenpeace destroyed an entire research crop of GM plants, pretty well reversing 15 years or study. Normally I also agree with Greenpeace, but I think a swipe at them can be excused in this case. http://www.cosmosmagazine.com/...

Flag

Like ReplyReply

dom legras 23 hours ago

I don't think many people claim that monsanto (or other large coorperations) should have control of this sort of technology. But that doesn't mean it should be automatically discredited. The benifits of GMOs immensly outweighs the possible risks. It is not a 'false promise' either. Check out this article

(also on the atlantic) on Norman Borlaug, who is estimated to have saved a billion lives through genetic modification. http://www.theatlantic.com/mag...

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1 person liked this. Like ReplyReply

Swiftright Right 22 hours agoin reply to dom legras

I dont have an opinion on GMF (I prefer to hold judgement till there is some solid science) But I have to say reading " The benefits of GMOs immensly outweighs the possible risks." Took me right back to an old newspaper article on asbestos insulation. "the benefits of Asbestos outweighs any potential risk"

Well we all know how that miracle fireproof insulation worked out.....

Flag

1 person liked this. Like ReplyReply

dom legras 22 hours agoin reply to Swiftright Right

Of coarse it has to be really heavlily regulated, as I admmit the potential risks are pretty bad, but the benefits of asbestos weren't that great anyway, at least not as great as the potentail to help world hunger.

Flag

Like ReplyReply

Swiftright Right 17 hours agoin reply to dom legras

What I wish they would do is regulate it so that they had to prove it safe instead of demonstrating it doesnt clearly harm us. A system like what they use with pharmaceutics. At the very least we should have a right to know if we are eating GM so that I as a consumer can make a choice.

Flag

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nairb95 21 hours ago

I expect much better from the Atlantic. Granted the science is complicated, but this is why the author might have consulted, you know, a scientist before writing up a post that will further scare people about something for which there is simply no scientific basis. If it were so easy for miRNAs to be orally absorbed and have biological effects then drug makers would be all over this. Designing miRNAs you could take in pill form for some therapeutic benefit. Alas, they are not doing this, because, well, because it just doesn't work that way.

Flag

1 person liked this. Like ReplyReply

Ryan Boehning 18 hours ago

Don't fall for this one, liberal friends. The author is using some Fox News-level distortion and scaremongering here. I'll try to keep this short, because this is Facebook.

The study is really cool, but it has nothing to do with GM foods. What it shows is that miRNA's MIGHT be a new class of nutritionally important molecules, like carbohydrates and proteins. There are a million questions that have to be answered before someone could credibly claim that GM foods cause harm because of their miRNA's.

Is MIR168a the only miRNA that can survive digestion (probably not)?

Is there something unique about rice that allows miRNA's to survive digestion? Can the same miRNA in another type of food survive digestion?

Do these miRNA's have any significant influence on our health, or is their effect totally negligible?

Do GM foods have different miRNA profiles than non-GM foods? GM foods might have healthier miRNA's than "natural" alternatives.

Did the researchers just totally screw up their experiment?

I'd say we're at least 10 years and several million dollars worth of research away from knowing the answers, but the author skips all of that and goes straight to the sensational claim that GM foods are evil because of their miRNA's. The statement "DNA can code for microRNA, which can, in fact, be hazardous" betrays his ignorance of the science. I looked him up. He's a chef, not a biologist.

The Atlantic really dropped the ball on this one.

Flag

5 people liked this. Like ReplyReply

local freak 17 hours ago

this is crazy were eating information now if that true my next was could we just put information in are food and learn as we eat ? dont read that book just eat this cheeseburger with extra info

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OccupyPsyche 17 hours ago

http://www.youtube.com/watch?f...

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OccupyPsyche 16 hours ago

Just for starters..ENCOURAGE .de centralizing food.. Free up government land for reclamation and small scale local food production... http://www.youtube.com/watch?v...
gotta love this..all the work we have gone to to kill one of the most nutrient rich plants in the world http://www.youtube.com/watch?v... diverse crop plantings protect against single crop failure.
Learn to eat your local weeds, un-sprayed of course. If you live in a city try this... http://www.ehow.com/how_210034...
I really prefer positive solutions to feeding our selves as much as we can, the best we can. Our biggest problem is the infrastructure has made us lazy to food knowledge ie; what it takes to get a pig or a cow for meat. How long does a potato need to grow? http://www.ehow.com/video_4755... for city folk
all we can do is start to eat less of the foods that stress the system and make an attempt at feeding our selves simpler more local food. We all have to go to grocery stores, most of us eat what we can afford and are happy for it. No shame should be placed on eating. No fear should be either. If Monsanto is so proud of there products ..why don't they label them? Because if we had a choice..we'd choose not to. I myself gave up Frito's..I loved Frito's but I don't need them for food.

Flag

Like ReplyReply

Helen Pu 9 hours ago

selective breeding and GM is the same thing. Except people see one as 'natural' and it takes a 'long time' versus the other people think only happens in a lab. If I eat an apple that is extra sweet and I want more of it I can either grow apples from those seeds, which means I chose a specific DNA combo that produces a specific trait. Or I can isolate the DNA in a lab and then grow apples from those seeds. If we are saying microRNAs are dangerous then we need to start testing ALL food. Because ALL FOOD contains microRNA and NOONE has tested whether non-GM foods have safer microRNAs than GM foods.

Flag

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Fromthefarm 7 hours agoin reply to Helen Pu

Completely incorrect. Selective breeding uses only traits that already exist within a given species. For example, in the past, field corn varieties were developed strictly by interbreeding corn types to emphasize certain traits found in and common only to corn plants.

Genetic Modification inserts traits from one species into an unlike species. For instance, scientists have taken a protein from a bacteria and inserted it into the genome of a corn seed to produce a plant that disrupts the digestive systems of certain, destructive worms that feed on corn plants, yet this same bacterium does not interfere with the digestive tracts of animals and birds.

Flag

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AtlanticMM 15 minutes agoin reply to Fromthefarm

No, you are both correct. In fact, I would postulate that if you took very large area of corn and exposed it to this destructive worm and bacteria, and bred the survivors that over time you would get the same result. Species DNA/RNA crossover happens in nature.

Flag

Like ReplyReply

VSullivan 7 hours ago

While we wait for science to catch up, age-old wisdom tells us, "You are what you eat." Americans eat the same food that has been designed to make our cows gain as much weight as quickly as possible: GMO corn and soy. And it has: cows eating GMO corn and soy gain more weight faster than cows ever have in agricultural history. We humans eat this same GMO corn and soy, and some of us eat the cows raised on a diet of GMO corn and soy, too. Doesn't it stand to reason that this would make us fat, too? And it has: American obesity has reached an all-time high.

I wrote more commentary on this post in my article, "Does Your Body Know You're Eating Genetically-Modified Foods?" --

http://wellnessandequality.wor...

Flag

Like ReplyReply

Fromthefarm 7 hours agoin reply to VSullivan

There is science and there is (il)logic. You make the mistake of confusing the two, plus you throw in a good measure of unsupportable, personal opinion.

Flag

Like ReplyReply

Robin Schoen 6 hours agoin reply to VSullivan

I think the thing that drives scientists nutty is when people set up a cascade of unexamined inferences as you have done and announce that it "stands to reason."

Flag

1 person liked this. Like ReplyReply

AtlanticMM 19 minutes agoin reply to VSullivan

"

Doesn't it stand to reason that this would make us fat, too?"

No, this is 100% faulty reasoning lacking a true cause and effect and a great example of why scientists, and not lay-persons, need to make these calls for us.

Flag

Like ReplyReply

Ari LeVaux 6 hours ago

Hey look, not everyone hates me!

http://michelebusby.blogspot.c...

"Ari LeVaux May have a Point"

Flag

2 people liked this. Like ReplyReply

VSullivan 30 minutes agoin reply to Ari LeVaux

I think you've written an excellent article that draws attention to an important debate. Pointing out conflicts of interest and asking for more research/testing/studies is a responsible, and reasonable, stance. Thank you!

Flag

Like ReplyReply

tripxxx 5 hours ago

Tore B. Krudtaa come and join our family we are a group of hardworking people..we're currently looking for a data entry specialist to join our team we will pay you $70/hour go to our site for processing U.S and U.K residents are prioritized...MakeCash10.com

Flag

Like ReplyReply

rachel1203 4 hours ago

This is a really good debate. In the end, though, doesn't it come down to choice for the consumer - shouldn't we be informed about whether the food we eat is GMO or not and make the decisions for ourselves about what we put in our bodies? We decide whether to eat high fructose corn syrup,

which some believe is bad and others think it's the same as sugar. But the reason we can decide is because it's labeled. GMOs should be labeled too, for the same reason. So consumers can decide based on our own research and what we choose to believe is true and best. If you agree, you should check out www.justlabelit.org.

Flag

1 person liked this. Like ReplyReply

AtlanticMM 21 minutes agoin reply to rachel1203

Well, you have to make judgments on what to label and what not to label. In the case of the US, the FDAs job is to require labels details on things that it deems 'make a difference.' This is the job of FDA scientists, not reactionary lay-people.

Should the FDA require a label of Wisconsin vs California cheese because one state is more stringent with their pesticide ban?
There are all sorts of FDA regulations that are NOT places on labels - arsenic levels in apple juice, rat feces acceptable per bushel of corn, etc.

Should organic food be labels with its average insect part per million?

And even if you did believe it needed labeled, should be "this food may contain GMO food" or should it be up to non-GMO foods to label they are not GMO if they want. Similar to "organic" you could have "non-GMO", but not the other way.

Or even if you wanted GMO labeled, at what percentage? Does it need to be prominent like GLUTEN-FREE? Or part of the smaller print? Or on each ingredient in the ingredient list? Or can we go with a "may contain GMO" just like the peanut warning?

I mean, the label idea is great, but you need to put on there, in limit space, what is really important. Does GMO warrant such a high place? If so, what studies indicate it does?

Flag

Like ReplyReply

Miranda Mickiewicz 3 hours ago

I agree with you, Rachel.

Unfortunately, the argument we're up against is that labeling things as "Contains XYZ" can be interpreted as a warning to less informed customers (which, arguably in the the case of GMOs, it IS, but Monsanto would never stand for that). Take, for example, the case of gluten in foods. There is a rising number of people who are sensitive to gluten (myself included), and shouldn't eat it. However, there's no evidence to suggest that it poses a risk to people who don't have an allergy or sensitivity. Nonetheless, people who see products labeled as "contains gluten" or even “gluten-free”, may believe that they are labeled because gluten poses a risk to everyone. Thus, we have a trend of lots of people avoiding gluten despite no health basis for it. Monsanto fears the same would happen in the case of GMOs (which I, for one, would hope to be the case), but how can you refute that argument without evidence that GMOs do pose a real threat to the average consumer?

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firstometiklon 1 hour agoin reply to Miranda Mickiewicz

I hope I am nit-picking here, but you and Rachel seem to have been suckered in by a commercial I thought originated as a Saturday Night Live parody. I am speaking of the corn syrup industry sponsored piece declaring that "whether its corn sugar or cane sugar, your body can't tell the difference, sugar is sugar," as if EITHER one is a healthy choice. It is rediculus to base a decision on something is as healthy as sugar. Hopefully they din't actually fool you.
The problem is that we are letting big ag say whatever it wants- to the point that instead of picturing lost children, my milk container informs me that I am an idiot because "The FDA has determined there is no significant difference between milk from rbST treated coms and non rbST cows." Why don't I have the right to buy hormone free milk without it taunting me.
I think your argument is well intentioned in not wanting to confuse or mislead consumers. However, this same logic is being used to bully people into consuming GMO foods. Right now Canada is threatening all of Europe with World Trade Organization rules claiming it is illegal to ban GMOs unless they can PROVE they are harmful. They claim FEB 11 as some kind of deadline before they will persue trade sanctions. I never thought of Canada as an imperial force to be reckoned with, but I guess I'm just lucky my government slips me the gmo canola oil without so much as a label so I don't have to live in fear of this menace to the north.
This last bit about Canucks was just facetious, but maybe it will exemplify how dictatorial Monsanto's tactics are.

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AtlanticMM 46 minutes agoin reply to firstometiklon

"Right now Canada is threatening all of Europe with World Trade Organization rules claiming it is illegal to ban GMOs unless they can PROVE they are harmful."
There is no simple answer because, in reality, you don't know if GM foods are more harmful, less harmful or the same as 'natural' DNA foods. Heck, may they are safer because they are more resistant to mutations or less likely to have animal proteins from insect infestations or whatever. Or maybe they are indeed more harmful.

But, a first stake needs to be placed in the ground. This cannot properly be done by the layman, by governments, but must be done by science. You also cannot, will not, have 100% certainty before you move ahead.

Right now, I don't know of any scientific evidence that shows any reason why ever-so-slightly modified DNA is in any way likely to be more harmful than 'naturally occurring' DNA and its many mutations.

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Miranda Mickiewicz 22 minutes agoin reply to firstometiklon

If you read carefully, I wasn't saying that I agree with that line of reasoning. Rather, I was pointing out how ridiculous it is, and wondering how to argue against it!

Clearly, GMOs pose an uncertain risk to consumers. Given that they are untested, it should at the very least be differentiated in an ingredient list whether or not ingredients are GMO, and let consumers decide whether or not they want them. Right now, even the most careful look at a package doesn't tell you what's inside in terms of GM foods.

My suspicion is that if GMO products are labeled as such, in ingredients or separately, sales of those "foods" will dramatically decline, even without government bans on the products.

Flag

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AtlanticMM 1 hour ago

Well, generically altered RNA/DNA is no different than mutated RNA/DNA that occurs all the time. You eat three organic apples, even from the same tree, and you'll have likely millions of DNA/RNA mutations in there.

All this is based on a totally unfounded assumption that man-made 'mutations' are somehow more dangerous than natural mutations.

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Pliny_the_Elder 34 minutes ago

How do you jump from a study that suggests miRNAs can survive digestion to freaking out about GMOs? Not that Monsanto isn't at the cartoon-villain level of evil yet (it is), but to make a connection there has to be a study comparing miRNA expression between GMO and non-GMO food. Until then, this is a great example of the awful state of science journalism.

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Duridy Duridy 24 minutes ago

Even before this news I always figured it was safer to avoid GMO foods, simply because we evolved to eat non-GMO foods (and non-GMO foods evolved to be eaten).

Tinkering with an equation designed over millions of years just seems like a bad idea.

What I wonder about: if we are still in the infancy of genetics understanding, what kind of testing could be done today to allay fears of GMO foods?

Not much I would guess - unless it would be intended to placate and whitewash the situation instead of actually determining safety.

If that's the only kind of testing we can practically get, I would rather simply not have people eating these foods, period.

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AtlanticMM 3 minutes agoin reply to Duridy Duridy

Except nothing you state is a fact, it's all opinion/speculation. It's like coming across the first tribe that cooked their meat while all others at raw meat. Cooked meat is man altered, not what humans evolved on. But just so happens to be better for you.

There is absolutely nothing anywhere to suggest that alteration by 'nature' is better or worse than alternation by 'man' in any general sense. None.

Let's say that down in an isolated jungle a patch of corn was found that is naturally resistant to mold and bugs. Now let's say we have a GMO patch of corn in Iowa that has the same traits. by what stretch of fact-based scientific reasoning could one argue that one is better or safer than the other?

Would you blindly eat either? No. You'd do some studies and based upon what you know about normal corn, which is deemed safe (at least at this point), what is the likelyhood of either of them being safe. After some study period, you'd make a decision to the best of your current knowledge. I think we have done that on GMOs.