

## Science communication essay

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Let's suppose that a young boy (Let's call him Pip. Let's also suppose that he's 1,5m tall, has brown ruffled hair and is frightfully curious and bright.) asks me in a letter – as a biologist and ecologist he listens to on a radio station – about genetically modified organisms (GMOs). “What is all the fuss about?” asks Pip. “It's constantly on the news and my mum always buys food that says non-GMO on the package. Why is it bad?”

Let's pretend that this is a monologue that could be broadcast on a radio station as a reply to a letter from Pip, who asked about GMOs.

Dear Pip!

I'm glad you sent me your letter. It's a hot topic and no wonder you are curious about it. Let me tell you about it. It's a bit complicated, but I think you'll understand. GMO means that the plant, animal or one of those tiny bacteria (who are not all bad, by the way) has a little bit of DNA, that is called a gene, from another animal, plant or bacteria. You know what DNA is, right? It's information in each of our cells about how we function. It's like a recipe or instruction manual for a being. Suppose you put some DNA from a bull into a cat, it might not be a normal cat anymore, but rather a Super-cat, that's strong as an ox. Imagine an apple that tastes of strawberries. Or that humans would never have cancer. Or that a house would grow out of a seed. A bear that's a third giraffe and a third tortoise. However, that last one might not be particularly useful. I made them up, but I'll tell you some true ones. It's not bad to have a little bit of imagination, however.

We actually started changing the DNA of animals, plant and microorganisms thousands of years ago. We did it through selection. When our ancestors liked a property of an apple, for example, they used its seeds again to grow more apple trees and again selected seeds from the trees they liked. That means they actually selected the genes that suited them. They did similar things with other plants (wheat, corn, pears), animals (like cats, dogs, cows and horses) and even microorganisms (like yeast, some of which is used for bread and some for brewing). Without selection of genes, we wouldn't have the kind of tasty, big fruits we have today. But with selection we can only exchange and select genes of the same species. Bacteria could exchange genes between species in little “packages” call plasmids for millions of years. Genetic modification as we know it nowadays allows us to exchange the genes of species that aren't related at all!

Scientists around the world have been able to put genes from one live being into another since the 1970's. And the more we learn, the more we will be able to do. Put some DNA from a jellyfish into a bacterium and it grows in the dark. Then it can be used to tell whether something is poisonous – when it doesn't feel good it glows a bit less. Or maybe rice that has vitamins so that people who eat it don't get sick. They did that in Africa, so that children got enough provitamin A. It's the reason carrots are orange and good for your health too. Today, African scientists are also trying to do that with bananas, so that people will get healthier. People that have diabetes have been taking insulin produced by yeast or bacteria for decades. Other scientists are trying to produce potatoes that are resistant to disease and wheat resistant to drought. GMO corn has less diseases and poisonous stuff than ordinary corn. Scientists made pigs with the genes of bacteria to make them more environmentally friendly. Even spider-goats exist! They are goats with the gene for spider silk. While they can't climb walls, people are trying to use the silk in their milk to heal injuries.

So genetic modification can be really useful and exciting! But you probably still wonder why people are afraid and don't want GMO. Some people are just a bit fussy and they imagine that corn could have a gene from bacteria or pigs and they don't like the idea. Surprisingly, my physics teacher in high school was like that. She couldn't stand the idea and that was enough of an argument for her.

But there are darker sides. People are afraid that corporations like Monsanto might produce GMO seeds that they will sell and then the farmer can't use the seeds from his crop next year. He has to buy new ones each year or Monsanto will sue him. So people are afraid big corporations might control farmers like that. Another problem is that while corn that has some stuff that makes it poisonous to pests might also be bad for good animals, like bees. If a lot of bees would die, no one would pollinate our crops and we'd have a big problem! And even worse, if plants were modified to have stuff that some people would be allergic to, it could be dangerous for ourselves. That means that scientists really have to take care with what they do and what genes go out into nature. And governments have to make sure that corporations don't exploit the people that need to buy seeds. So while it can be very useful for people it might also cause problems. That is why we need to work more on GMOs, make sure they are safe and used responsibly. But don't worry, GMO corn won't eat you. It might actually be good for you. If you are good in school and interested in genetic engineering, you might be a great scientist one day. Who knows what you will accomplish?

For your essay, you must write a letter to a 12-year-old in which you explain a specific topic that recently caused major public distrust or was misused by populist movements. It could be about climate change, gene editing, vaccination, big data, autonomous machines, opportunities and risks of digital media, or any other ethical issue that you think has enough importance to influence their future or even shape their careers or life goals. Choose one topic and then stick to it. Begin with a simple question and offer a smart and inspiring answer or solution. In a one or two page long letter try to follow this 3-step rule: Enthuse – Engage – Enlighten. You can also choose a more personal approach and share details from your life or career. However, before you start writing, please read the article below very carefully. It might help you find innovative ways of engaging with the public. Moreover, remember: think through stories and stay true to facts!