

“Fear due to a lack of knowledge”

Genome editing dispute: in this interview, Prof. Dr. Dr. Christiane Nüsslein-Volhard takes a stand in the risk debate on new biotechnological methods. At her laboratory at the Max Planck Institute for Developmental Biology in Tübingen, the Nobel laureate is studying zebrafish and how their colour patterns form.

Ms Nüsslein-Volhard, why are Germans being driven by fear when it comes to genetic engineering?

Well, I'm not concerned! This fear is essentially based on a lack of knowledge. People don't know anything about genetics and only listen to what is wrong. The same goes for politicians. They would rather believe Greenpeace than scientists, and all sorts of long-disproved stories are told which stoke fears.

More knowledge – in this case about biology – is this not also an educational mission?

Yes, actually it is. But pupils at school already have to endure so many subjects. And we must not forget that living beings are incredibly complex. More complicated than a computer or a car; and nobody understands even them. But there is a need. It is shocking how little people know about where their food comes from, how species are cultivated or how the soil is prepared so that anything grows at all. Resistance to the herbicide glyphosate is also based on a blatant lack of knowledge. Glyphosate results in a weed-free field much more gently than any ploughing and harrowing does. But no one knows this.

Science doesn't have a particularly good reputation in Germany at the moment.

In fact, we often see distinct hostility towards science. “Alternatives” are very popular, such as alternative medicine or organic farming, which is being pushed tremendously. People who buy organic produce simply feel better. But this generally isn't justified at all. Organic food is neither healthier nor more environmentally friendly or more energy-saving.

Must science provide more information?

Germany does not have a long tradition of scientific institutions consulting lawmakers on policy, unlike the USA, for example, where the “National Academy of Sciences” plays a leading role. I have high hopes for the German National Academy of Sciences Leopoldina. It has, for example, published opinions on genetically

modified plants and genome surgery using CRISPR. The facts of the matter are summarised well and in a scientifically reliable way. It would be nice if politicians would simply trust Leopoldina.

Genome editing, such as that with CRISPR/Cas9, allows for precise interventions into genetic material and is causing a sensation. How do you rate this method?

I think it's marvellous. CRISPR/Cas9 is beneficial for research. We get better and more accurate results faster and with less effort.

Do you use genome editing yourself?

We use it to investigate the biodiversity and evolution of organisms. There has been progress that was previously unthinkable.

Do you see any risks involved with CRISPR/Cas9?

If we follow all the relevant laws, of which there are plenty in this country, then there is no risk whatsoever. Of course, there are people who do not want nature to be genetically modified and, therefore, generally reject these kinds of tools. And there is the fear surrounding the genetic manipulation of people, which is a theme in many science fiction novels.

A scientist in China has already done this.

That was an isolated case without far-reaching significance.

In June 2018, the European Court of Justice classified CRISPR/Cas9 as genetic engineering and subjected it to existing legal regulations.

Totally wrong! It would have been better to relax genetic engineering legislation so that these methods could be applied more easily in agriculture. This is so difficult in Germany today, and because of that there isn't a single genetically modified plant in the field.



Professorin Dr. Dr. Christiane Nüsslein-Volhard in the fish house at the Max Planck Institute for Developmental Biology in Tübingen. Here, the biologist is researching embryonic development in animals, particularly the zebrafish.

According to surveys, Germans do not have much sympathy for “green” plant bioengineering. Your suggestions would probably be met with a divided opinion.

The law is so strict because politicians believe the population wants it to be that way. But this blocks overall development. This should really be reconsidered because genetic engineering methods are incredibly successful in cultivating new species that are more environmentally friendly, more productive, and more economical. It would be desirable for us, too.

Would you agree that CRISPR is synonymous with conventional genetic engineering as the European Court of Justice says?

I simply cannot understand this logic because you can achieve the same results with the CRISPR method as with conventional cultivation. There is no difference. It is therefore wrong to legally classify a product according to how it has been produced. Especially since conventional cultivation is so much more brutal. Plants are well and truly blasted with ionising radiation or chemicals to produce genetic changes, haphazardly and randomly. ■

99
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