

# “Discuss first, then regulate!”

The molecular biologist and science theorist Martina Schraudner on the need for society to reevaluate the meaning of biotechnology



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The development of mRNA vaccines against COVID-19 has opened the door—it’s time for a reevaluation of biotechnology. The fact that bioengineering was used to quickly produce very effective vaccines against the global threat posed by the coronavirus has triggered a rethink among many people, including those in the capital market and in large swathes of the political arena. People are not just debating the benefits and the obligation of vaccination—the label “biotech” is now suddenly seen as the option on fantastic profits, and governments are vying for companies from this sector who are looking to establish facilities in new locations. In these circles, biotechnology firms are, in some cases, even more in vogue than the previous favorites from the IT sector—perhaps, in part, because they combine digitalization with life sciences.

## BIOTECHNOLOGY AS A JOINT EFFORT

Ideally, biotechnology can become a joint effort between society and the scientific community—provided its benefits are properly communicated. This could be done, for example, by sharing medical and genetic data so that this knowledge can be used as the basis for customized diagnoses and therapies. Promising steps have already been taken in this direction: the UK Biobank, for example, and its Finnish counterpart FinnGen. These independent digital databases provide researchers with medical information about around 500,000 people. In addition to information about the participants’ size, weight, and blood pressure, they also contain data about genetic sequences. In both systems, the data is supplied voluntarily and is anonymized. These databases have met with a great response. The resulting treasure trove of data has already enabled numerous medical discoveries.

However, as with all innovations, biotechnological progress doesn’t mean that innovations are automatically a good thing. They have to be placed in context and evaluated by society and eventually also regulated. The question is: Which applications do people want and are willing to support? For which ones is there a broad consensus regarding their utility and additional benefits compared to their potential risks? Are there any ethically motivated “red lines”? What should be the background, environment, and goal for the development and use of biotechnologies?

Many people would like to delegate the answering of these questions to governments and regulatory authorities. However, it would be vastly inadequate if the first step were to be regulation.

Every regulation must be developed on the basis of a public discussion process. This is vital if a broad consensus is to be achieved on the key issues. And only such a consensus can provide all of the players in the biotechnology sector with the reliable framework that they need to orient their research and investment activities.

There are numerous current examples that show how necessary such a discussion is. For example, we are still in the very early stages of this discussion when it comes to the methods of high-precision genome editing. Two years ago, the European Court of Justice ruled that genome-edited plants are subject in the EU to the regulations that were previously made for conventional genetic engineering. However, from a scientific point of view, the targeted genetic modification of plants is both more efficient and safer than undirected techniques such as mutagenesis and selective breeding. Although the justices clarified a legal matter within the existing political framework, the scientific basis has since then evolved further so that the legal framework might also have to be reassessed. What our society wants can only be clarified by means of broad-based discussions.

Such necessary debates can only be initiated if there is better communication about biotechnology and, above all, if two classic mistakes are avoided: first, the cultivation of boredom with the subject in order to prevent possible resistance and, second, the attempt to influence people by means of sensationalism, exaggeration, and reduction. Such dead ends are very common in today’s communication of technology. Sometimes people will be rather embarrassed and shift uncomfortably from one foot to another as they wish to avoid saying anything that might be unpalatable. They will make use of catchphrases and vague imagery. At other times, they will overdo it with expressions such as “fourth industrial revolution,” “technological singularity,” and “nanorobots,” causing the initially thrilling shudder to turn into a concerned frown. The cloned sheep Dolly and subsequent exaggerations of cloning research are vivid examples of this from the field of biotechnology.

Biotechnology-related communication currently focuses on safety. This was the case, for example, at an event staged by the German government concerning bioeconomics. To address the topic, the responsible PR agency came up with a wide range of colorful communication formats. However, one word was completely missing: biotechnology. “Why is that?” I asked one of the agency’s employees. He replied that “the word”—which he avoided saying—“was hard to communicate.” As a result, common European buzzwords such as “bioeconomics,” “Green Deal,” and “farm-2fork” quickly become elusive substitutes for the matter at hand.

## BUT WHAT ABOUT “LAB-GROWN MEAT” OR “MEAT ALTERNATIVES”?

Admittedly, the combination of “bio” and “technology” in one word bears connotations. It’s therefore not surprising that PR agencies prefer to use images of algae, spider webs, dandelions or sustainable clothing. Many studies and surveys have shown that much depends on the framing, i.e. the use of certain formulations in order to achieve a specific effect. In Germany, for example, this is

demonstrated by our representative TechnikRadar study concerning all aspects of bioeconomics. According to the survey, two out of three Germans stated that “lab-grown meat” wasn’t a good thing. However, the results are different if you ask people about “meat alternatives.”

But you should not think that I’m trying to encourage the excessive blurring of terminology. In the end, such an approach is often more detrimental than beneficial because it distorts people’s perceptions of reality. In the TechnikRadar study, many respondents expressed a deep-seated concern about a supposed “alienation from the production of their food.” Due in part to the terminology used, a decoupling is taking place between people’s perceptions of agricultural production and reality. For example, it is a cultured prejudice that organically grown products are by their nature sustainable, while conventionally grown ones are not. Actually, science and (bio)technology should help to further develop the best features of organic and conventional farming in order to secure humanity’s food supply.

## NEW WAYS OF COMMUNICATION

Not every biotech innovation can be as important and significant as mRNA technology. However, even every minor innovative success opens up a new opportunity for intelligent and frank communication, even if it’s a bit bumpy and unrefined. If the drivers of innovation manage to become approachable and make biotechnology a joint effort, this would clear the way for society’s reevaluation of this topic and consequently provide biotechnology with an innovation-promoting regulatory framework. This would benefit mankind as well as the environment.

The communication about new technologies should perhaps not—or no longer—focus only on risk assessment, i.e. the question of the benefits and the possible risks. Perhaps it should rather be asking against what background, in what context, and with what goals the technologies will be used. In view of this, the time is ripe for society to reevaluate biotechnology. The development of mRNA vaccines made its benefits publicly obvious. But change will only be possible if it is communicated more courageously and openly. Statements and clarifications become necessary—without, however, avoiding the discussion about risks.

The increasing decentralization of the sector, which is being shaped by exciting startups, is creating a new opportunity for the communication of biotechnology. This structural transformation is being caused by the availability of venture capital, the declining cost of modeling and synthesis of nucleic acids, and the combination of methods from the areas of chemistry, biotech, AI, and Industry 4.0. A flourishing ecosystem of innovative startups has arisen in the food sector in particular. The startups for fermentation, new craft beers, and vegan specialties can be the ambassadors of a biotechnology that promotes diversity and sustainability. —