

The Rockefeller University Hosts Panel on Human Genome Editing



By Julianna LeMieux — February 14, 2017



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Human genome editing, like self-driving cars or drone delivery, is becoming a part of our everyday reality faster than we realize it.

A panel discussion held at The Rockefeller University entitled "The Future of Gene Editing: A multi-disciplinary panel discussion" brought together four experts who tackle the challenges of human gene-editing from different approaches and perspectives, based on their individual focuses and specialties. Why does this particular area of science need so much conversation?

There are significant concerns, to be sure, especially about unintended consequences. People are particularly nervous about [gene drive technology](#) [1] and the release of altered species into the environment. Fears include these altered species entering the food chain, causing the extinction of their or another species and the creating of organisms that we never thought possible, if mutations were to occur, such as super bugs.

Somewhere in the middle of these extremes lies an incredibly difficult, emotional, human conversation that needs to draw lines in new territory where we are not comfortable and have had no practice finding boundaries.

Jamie Metzl (Senior Fellow, Atlantic Council) introduced the subject with the perspective that gene editing is the single most important topic that should be discussed at this moment in time. Why? Because, as Metzl said, "this is the time when our species took control of our evolutionary process." Moreover, there is no clear answer as to where lines should be drawn between scientific progress and going too far.

One option would be to throw up our hands and let people do what they want - why restrict science? But, the technology behind [CRISPR](#) [2] can be done by almost anyone with a pipette, so, we must define the rules of engagement. But, stifling all progress because we are scared of the unknown is also not the best answer.

Metzl started with a comparison between two people who talked about traveling to the Moon - Jules Verne, who wrote: "*From the Earth to the Moon*" in 1865 and JFK who spoke about going to the moon just seven years before Apollo 11. Metzl's point is that, when it comes to human gene-editing, we are in 1962, not 1865, and we need to think about it in the present, not as a hypothetical that may happen at some point in the future. As Metzl says, this is not a discussion about science, but, a "science-based conversation about the future of our species."

The other panel participants were Roberto Barbero (the Assistant Director of Biological Innovation, White House Office Of Science And Technology Policy), S. Matthew Liao (Director, Center for Bioethics NYU) and Marnie Gelbart (Director of Programs, Personal Genetics Education Project, Harvard University.)

An ongoing challenge in science communication is in engaging a public that neither truly understands nor trusts science. Marnie Gelbart raised the issue of how can we get everyone to the table for this conversation? People have concerns that their genetic information may be used against them. Also, like most health care advances, access is a concern; gene editing will probably be available to the people who can pay for it - where does that leave everyone else?

For comparison, we can look at the issue of genetically modified organisms (GMOs) - a far less complicated and emotional issue than human gene-editing. [GMOs are the scientific issue with the widest gap in understanding between scientists and the public](#) [3], with 88% of scientists reporting that GMOs are safe to eat, as compared to just 37% of the public. Scientists understand the biology behind the creation of GMOs, but, have had a difficult time explaining it to the public. Lacking that understanding leaves a lot of space for fear and uncertainty.

If we cannot successfully communicate about GMOs, it seems unlikely that gene editing is going to be conveyed correctly. As science communicators, we certainly have our work cut out for us.

Matthew Liao took a more philosophical tack - how will we decide which traits to alter? He presented fascinating approaches that can be used in such decision making that will certainly be the topic of future articles. In short, he tackles this question from a perspective of human rights - and works on the assumption that every person has equal moral status, regardless of our differences. Further, he focuses on distilling down the minimum framework of what makes a human capable of pursuing a good life. And, this is where his work can get tricky because two people can easily disagree on what those traits are creating A LOT of gray area in the middle. But, at some point, we are going to have to decide on what type of human we are comfortable creating while realizing that diversity is the greatest strength of any species. And, as most of us are probably not comfortable making those decisions, it is the work of people like Matthew that will come to the forefront.

Overall, the panel discussion and, in particular, the audience's participation, raised many good questions that need to be asked and addressed. The last words of JFK's speech in 1962 are as

applicable to gene editing as they were at that time to space travel.

"Well, space is there, and we're going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. And, therefore, as we set sail we ask God's blessing on the most hazardous and dangerous and greatest adventure on which man has ever embarked."

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[1] <http://www.acsh.org/news/2016/11/02/what-gene-drive-hottest-new-thing-science-10122>

[2] <http://www.acsh.org/news/2016/05/25/what-is-crispr-cas9-and-why-do-we-need-to-know-about-it>

[3] <http://www.pewinternet.org/interactives/public-scientists-opinion-gap/>