The Human Race is More than a Rough Draft

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Abstract

In this essay I will explain the problems with germline gene editing and why we need to put international regulations on this biotechnology.

Keywords: gene therapy, genetic engineering, gene editing, genomes, germline

Introduction

Gene therapy is a relatively new breakthrough in scientific technology, and there are a lot of things that must be considered before we can move forward. We are all a part of the human race, and need to look out for the entire race.

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There are two different kinds of gene editing: somatic and germline. Somatic is the less controversial of the two because it only affects those who agree to receive such editing. Germline, on the other hand, is new and experimental, and anyone who is edited in this way will pass on the effects to their descendants. Germline editing has more potential benefits than somatic, however. Where somatic editing is a treatment, germline editing is a cure. The big question is, "Is the risk worth the reward?"

Currently, the risk is huge, if the biotech even works. In fact, CRISPR-Cas9 is only accurate in human embryos 15% of the time. (Nie, Walker and Li, 2019). If the edits *do* work, there are other dangers. Off-target edits affect the wrong genes and can cause mutations. Babies can be harmed by mosaicism, where the altered form of the gene is not present in all cells. According to the New York Times article, *Chinese Scientist Who Says He Edited Babies' Genes Defends His Work,* the scientific community is still unsure of what the consequences of such problems could be (Belluck, 2018).

With this technology, negative effects last. Even those that don't show up in an edited person might in their children. Even in non-humans, it's risky. If a toxic edit occurred in a member of a species that reproduces quickly, such as the mice we commonly test experimental biotechnologies on, it could spread like wildfire.

Even if germline editing was safe and reliable, there are ethical concerns. Some people, including the founding director of HKS's Science, Technology, and Society program, Sheila Jasanoff, argue that they are a bigger problem than the practical dangers previously listed.

Once again, we return to the age-old attempt to define humanity. As Jasanoff said,"I think we face similar challenges in… all kinds of frontier fields that have the potential to change not just individuals but the entirety of what it means to be a human being."

Therein lies the obligation of all humans, connected regardless of the many other labels we are assigned. This issue affects all of humanity, not just those few who have a say. Humans have gotten to where we are by caring for one another. Now we have to care for all humans who live now, and who will live in the future and have no influence on the mistakes of the past.

Because of these dangers, I believe that there need to be strict and clearly defined regulations for this new biotechnology on an international level. Not just in the US, but everywhere on earth where humans live and have the right to be protected from these dangers.

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