In early December, 2015, a group of scientists convened in Washington, D.C., to discuss the emerging ease of human gene editing with the discovery of a tool called CRISPR-Cas9. In simple terms, this tool gives scientists the ability to basically cut-and-paste sections of the human genome, and in effect, engineer humans to be free of hereditary disease. However, there is concern because this method makes gene editing easy and inexpensive. What does it mean to artificially alter the code that makes us individuals? What policy can be put in place to protect both the freedom of scientific research and society?

Background

Before this question can be answered, it is important to understand the background of scientific discovery and policy. The most easily applicable historical antecedent is the discovery of the technique to clone mammals. Though it was a significant revolution in genetic research, cloning was also condemned by those who felt it was unethical given the health risks associated with the technique. Human cloning was banned by the American Association for the Advancement of Science, and by the United States Federal Government with a series of bills in the early 2000s. Despite cloning being a potential new reproductive method, the skeptics of its ethical merits prevailed, and it was banned in humans.

Now, a new genetic revolution is facing the scientific community, and society as a whole. The New York Times writes, “The technique, known as CRISPR-Cas9 and now widely accessible, would allow physicians to alter the human germline, which includes the eggs and the sperm, to cure genetic disease or even enhance desirable physical or mental traits.” Essentially, the technology allows for the concept of “designer babies” to become reality. While it is true that the technology would allow for unprecedented preventive medicine for inheritable diseases, there are social and political implications of the technology and fears that this technology could harm society in unforeseen ways.

In addition to the medical potential for the eradication of certain diseases, the use of CRISPR introduces an underlying notion that certain genes are better than others. While that notion may be true concerning health and physical ability, when that idea is applied to appearance, the technology is eerily reminiscent of eugenics. Columbia Professor Robert Pollack writes, “the positive selection of “good” versions of the human genome and the weeding out of “bad” versions, not just for the health of an individual, but for the future of the species,” is a nod to eugenic theories, and should not be tolerated. When humans begin to decide which traits are desirable, outliers are not only socially ostracized, but they are at a genetically engineered disadvantage. CRISPR opens the door to a social hierarchy reliant on genetics, driven to benefit the only those who can afford it.

Wealthy people with enough resources can afford the genetic enhancement of their offspring, which would widen the wealth gap considerably. Not only do the genetically engineered offspring, or “designer babies,” have social privilege, but they are also created with genes to make them stronger, faster, smarter, more beautiful humans. In the MIT Technology review, Antonio Regalado writes that human germline engineering puts humans on the “path toward a dystopia of superpeople and designer babies for those who can afford it. Want a child with blue eyes and blond hair? Why not design a highly intelligent group of people who could be tomorrow’s leaders and scientists?” The upper echelons of society become even farther removed from the lower, and social mobility becomes obsolete. Many of these critics of genetic enhancement state that the American dream will die because it is im-
possible to fight privilege that is encoded in DNA.

There are some scientists who argue that human germline editing, with tools like CRISPR, is important to the innovative well-being of scientific research, and that there should be no ban on the practice. Harvard geneticist George Church is one such proponent, and he addresses the point of human enhancement by arguing that no formal agreement or policy will stop ambitious scientists from pursuing the field of study. Citing the indomitable practice of doping in sports, he asserts that people will stop at nothing to improve their performance, even in the face of calls for fairness and equality. The ban on editing would merely slow progress in genetic research and innovation in science.

**Recommended Action**

Scientific research should not be inhibited by governmental policy that serves to protect people if there is no real threat. Given that the research will be happening whether the government regulates it or not, especially in foreign countries, it is important that the United States government not let this country’s scientists fall behind. For that reason, I do not recommend a ban on further research into human gene editing. Instead, the policy that would govern the science must keep in mind the social dangers in relation to the medical advantages of CRISPR. CRISPR-Cas9 has the potential to revolutionize preventive medicine, and it would be cruel to keep such technology away from medical practice for the sake of the unborn children who may not have to suffer as much as their parents from hereditary disease. However, I believe that changes to the human germline that cause cosmetic effects, such as changes in skin color, hair color, eye color, height, etcetera, should be banned. CRISPR and other human gene editing techniques should target previously determined predispositions for diseases, and they should not be used to create an artificially perfect human being. This policy would protect the scientific community in continuing its research on this powerful technique, but it would also protect society from an influx of “superhumans” with undue opportunity, privilege, and ability.

**Endnotes**