# The United States ought to ban the use of germline genetic engineering in humans

## Topic Overview

#### The United States ought to ban the use of germline genetic engineering in humans.

*What is germline genetic engineering?*

Genetic engineering is a relatively new field of biological-medical science that allows for the alteration of genetic makeup in an organism through recombinant DNA (rDNA) technology. Traditionally, humans and other species have manipulated genomes indirectly by controlling breeding and selecting offspring with desired traits. With genetic engineering, one or more genes can be directly manipulated to bring about a desired phenotype. Since the 1970s when genetic engineering became an emerging field, experiments with this technology were limited to adding a gene from one species and adding it to another organism’s genome. To learn more about the science behind gene editing/modification/engineering, it would be beneficial to watch educational videos about CRISPR technology. The Mayo Clinic has a video explaining CRISPR (<https://www.youtube.com/watch?v=UKbrwPL3wXE>) as does the magazine, the Scientific American (<https://www.scientificamerican.com/video/what-is-crispr-and-why-is-it-so-important/>).

As the field and technology has advanced, scientists believe that the developing science behind germline genetic engineering is revolutionary. Germline genetic engineering is genome manipulation in germline cells such as sperm, eggs, or embryos. Germline genetic modifications, unlike somatic genetic modifications, change the DNA of an organism so it will be heritable to future offspring. In this sense, germline genetic engineering alters genes to bring about a desired phenotype not just in a particular organism but the entire future generational line of that organism as well. For context, a somatic genetic engineering operation would involve an individual getting their genes modified. A germline genetic engineering operation would involve an individual’s germline cells (sperm, eggs, embryos) being modified/edited so that the offspring that was borne from those cells would have the genetic modification. Proponents of germline genetic engineering have heralded the scientific innovation as the future of human evolution that could eventually lead to the elimination of genetic diseases and even the ability for parents to choose particular phenotypic features of their offspring that may be more desirable. Opponents of germline genetic engineering fear the unknowns about the relatively new technology, the impact on future gene pools, and other ethical challenges to the use of the science in humans.

It is important to note that this technology is not something lingering in the future, but rather something already here. Back in 2018 He Jiankui, a Chinese biophysics researcher and professor at the Southern University of Science and Technology in Shenzhen, China announced to the world that he had created the first human genetically edited babies, twin girls known by their pseudonyms, Lulu and Nana. The application of this germline genetic engineering that birthed the twins was an attempt to encode an HIV-resistant genome in their DNA. At first his experiment was initially praised in the press as a major scientific advancement. But following scrutiny on how the experiment was executed, He received widespread condemnation. His research activities were suspended by the Chinese government, he was sentenced to imprisonment, and the international community has since been engaging in an ongoing conversation about the ethical parameters around human applications of germline genetic engineering.

*Moral foundations and arguments*

The moral debate on this topic boils down to: what ought the US do in the face of this emerging medical technology? Should the US ban the use of germline genetic engineering on humans, or should it not have legal prohibitions on potential human application.

The affirmative side of the debate takes the position that germline genetic engineering in humans should be banned completely. This position could be articulated as a stance the US should take permanently on moral grounds, or at least currently because of the morality around a new scientific medical technology whose effects aren’t completely known or understood. There are strong moral arguments the affirmative has on their side of the topic. First, is the question of human dignity. Human dignity is conceived of as the respect and maintenance of what it means to be human. In a way, germline genetic engineering disrespects what it means to be human because rather than letting reproductive human nature play its course, it allows for the direct manipulation and alteration of both individuals and their future generations. Second, the affirmative can use moral arguments against eugenics to support their position against germline genetic engineering. Eugenics has a long history in the US and also in places like Germany where certain anatomical features were considered more “desirable” and “valuable” than others. This emerged in discriminatory ways through race, gender, disability, and more, where marginalized individuals were attempted to be “bred out” by emphasizing only “desirable” reproduction. Forced sterilization of people with disabilities, bans on inter-racial marriages, and racial classification laws like “one-drop” rules were all tools that advanced eugenics. Additionally, there are other ethical arguments affirmatives can make to defend banning germline genetic engineering. The precautionary principle is a scientific idea that urges a moratorium on potentially risky and dangerous experiments, especially on humans, until the science is completely understood and determined to be both safe and ethical. Collective species ethics can also be weighed against individual ethics, defending that the greater good of humankind and human gene pools should be prioritized over individuals’ medical decisions concerning their offspring.

The negative side of the debate has the position against a ban on germline genetic engineering, which there are many areas of moral support for. The negative doesn’t have to take the position that no restrictions or regulations should be made around germline genetic engineering in humans, but rather just that it should not be banned outright. The negative can argue that germline genetic engineering is moral because it is a freedom of individuals to control their own reproductive and parental decisions absent government interference and intervention. Additionally, proponents of germline genetic engineering highlight the science’s potential to eliminate heritable genetic diseases which demonstrates a medical and health benefit to the offspring and future generations of it which aligns with the medical field’s aim of protecting individuals. Second, the negative could argue that germline genetic engineering is the future of human evolution with the current knowledge and technology of bio-medical innovation and that such applications are no different than the traditional mate selection for reproductive gene pooling that species have done for millennia. Lastly, the negative can take a realist position that the technology already exists, and that germline genetic engineering is likely inevitable. Therefore, it’s more important to make guidelines and regulations around the use of the technology than trying to ban it outright.

*Debating the resolution*

Both the affirmative and negative side of this debate have strong arguments and moral backing for their respective sides.

Affirmatives would be strategic to argue that germline genetic engineering is a relatively new technology and that the long-term effects of altering the gene pool of humans is unknown. While trying to prevent heritable diseases may be seen as a noble endeavor, it is unknown if germline genetically modified individuals could have side effects that may be passed onto their future offspring as well that may be worse than what was attempted to be cured. Affirmatives would be wise to emphasize that bans aren’t always permanent – they are rather a tool to prevent something from occurring in the current moment and immediate future because of potential risks and harm. In this way, the affirmative could argue that germline genetic engineering could be allowed under certain conditions in the future once the science is known and understood enough. Additionally, affirmatives should underscore the moral and ethical challenges to germline genetic engineering such as eugenics which could create a future where certain human characteristics (genetic diseases, conditions, disabilities; phenotypic features such as hair and eye color, height, even race or gender) are seen as “undesirable” due to the ability of “designing” one’s own genetic offspring.

Negatives would be strategic to argue that all species have indirectly altered their gene pools through mate selection and reproduction for as long as they have existed, and that such alternations are a natural part of species evolution. It is only now in the modern era that humans possess the technology to influence genetic determinism in their own hands. Negatives would be wise to emphasize that other mechanisms exist besides complete bans. Regulations, guidelines, and limitations could all prevent unethical uses of germline genetic engineering on humans without preventing the technology from having use completely. Additionally, negatives should underscore the moral and ethical justifications for germline genetic engineering such as the elimination of heritable genetic diseases that make certain individuals (and their genomes) have harder lives and sometime slower quality due to medical conditions and diseases that limit their life expectancy and quality of life.

Debates on this resolution will likely not have much clash concerning definitions of words and phrases in the resolution. More likely, the debate will be around the substance of value and criteria and each team’s respective contentions. Weighing value and criteria and the world it justifies, and the impacts of your contentions, will be the way to win debates on this topic.

## Definitions

### Ought

#### Ought to means necessary or good

Cambridge Dictionary, 2021
“Ought to,” Cambridge Dictionary, <https://dictionary.cambridge.org/us/dictionary/english/ought-to> (accessed 7/7/21)

used to show when it is necessary or would be a good thing to perform the activity referred to by the following verb.

#### Ought implies reasons to do something

Patricia Greenspan, professor of philosophy at the University of Maryland, 2007
“Practical Reasons and Moral 'Ought',” In Russell Schafer-Landau (ed.), Oxford Studies in Metaethics, vol. II. Clarendon Press. pp. 172-194 (2007), <http://faculty.philosophy.umd.edu/PGreenspan/Res/ME.pdf> (accessed 7/7/21)

We can even think of moral requirements as amounting to particularly strong or stringent reasons, in an effort to demystify deontological views like Kant’s, with its insistence on inescapable or ‘binding’ moral requirements or ‘oughts.’1 When we say that someone morally ought not to harm others, perhaps all we are saying is that he has a certain kind of reason not to, one that wins out against any opposing reasons such as those touting benefits to him of ignoring others’ concerns.

The most common debate around the word “ought” is whether it constitutes an obligation: must the affirmative demonstrate that the US is required to ban germline genetic engineering on humans? Or merely that the US has the morally defensible option of doing so? The first definition views ought to mean necessary or good. The last one thinks that ought implies reasons to do something.

### Ban

#### Ban means to make illegal

Merriam-Webster, 2021
“ban,” <https://www.merriam-webster.com/dictionary/ban> (accessed 9/25/21)

: to prohibit especially by legal means

#### Ban means to forbid something officially

Cambridge English Dictionary, 2021
“ban,” <https://dictionary.cambridge.org/us/dictionary/english/ban> (accessed 9/25/21)

to forbid (= refuse to allow) something, especially officially

Ban is the action word of this topic. Both definitions provide that banning means to prevent something officially, or to outlaw it, so that it cannot be done.

### The Use Of

#### The use of means available to be used by

Merriam-Webster, 2021
“for the use of,” <https://www.merriam-webster.com/dictionary/for%20the%20use%20of> (accessed 9/25/21)

Definition of for the use of: available to be used by // The pool is for the use of hotel guests only.

#### Use means to do something with the purpose of achieving a result

Oxford Languages, 2021
“use,” Google’s English Dictionary powered by Oxford Languages (accessed 9/25/21)

verb 1. take, hold, or deploy (something) as a means of accomplishing a purpose or achieving a result; employ.

The phrase, “the use of,” or the word “use” will likely not be a very contested definition of the resolution. The first definition provides “the use of” implies availability, and the second definition explains that “use” means to do something with intention.

### Germline Genetic Engineering

#### Germline genetic engineering is changing the genes in human eggs, sperm, or embryos

Center for Genetics and Society, 2021
“Human Genetic Modification,” Center for Genetics and Society, <https://www.geneticsandsociety.org/topics/human-genetic-modification> (accessed 9/25/21)

Human genetic modification is the direct manipulation of the genome using molecular engineering techniques. Recently developed techniques for modifying genes are often called “gene editing.” Genetic modification can be applied in two very different ways: somatic genetic modification and germline genetic modification… Germline genetic modification would change the genes in eggs, sperm, or early embryos. Often referred to as “inheritable genetic modification” or “gene editing for reproduction,” these alterations would appear in every cell of the person who developed from that gamete or embryo, and also in all subsequent generations.

#### Germline genetic engineering is the direct manipulation of genes to alter characteristics in a particular way

Nishith Desai Associates, June 2019
“Are we ready for Designer Babies? Analysis of law, policy, and ethics surrounding germline genetic engineering,” <http://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research_Papers/Designer_Babies.pdf> (accessed 9/25/21)

Genetic engineering or gene editing, in simple terms, is the direct manipulation of an organism’s genes, to alter an organism’s characteristics in a particular way. While this technology has been known to scientists for a long time, it is the rapid development of this technology, through germ line gene editing, more specifically through the CRISPR-Cas9 technique, which has taken over the world by storm. With the capacity to alter the genes of a human embryo, potentially removing all the genetic defects and introducing new characteristics, germ line gene editing is ushering in a brave new world.

#### Germline genetic engineering modifies nuclear DNA in chromosomes that can be passed on to future generations

Rosamund Scott and Stephen Wilkinson, 2017
“Germline Genetic Modification and Identity: the Mitochondrial and Nuclear Genomes,” Oxford Journal of Legal Studies, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5903588/> (accessed 9/25/21)

There is no universally agreed definition of ‘genetic modification’ in humans. … The working definition that we have adopted is that genetic modification involves the germ-line modification of nuclear DNA (in the chromosomes) that can be passed on to future generations.

The phrase, “germline genetic engineering,” is the substantive portion of the resolution. Though it may not be the most contested definitionally. Germline genetic engineering on humans implies from all the definitions above, the modification of human reproductive genes to alter characteristics of humans that can be passed down to future generations.

## Affirmative

### 1AC

#### The power to modify the genome of future offspring is the power to design one’s own baby. Because of this, I stand resolved that: The United States ought to ban the use of germline genetic engineering in humans.

#### Observation 1: Resolutional Analysis

#### Definitions

#### Ban means to forbid something officially

Cambridge English Dictionary, 2021
“ban,” <https://dictionary.cambridge.org/us/dictionary/english/ban> (accessed 9/25/21)

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Nishith Desai Associates, June 2019
“Are we ready for Designer Babies? Analysis of law, policy, and ethics surrounding germline genetic engineering,” <http://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research_Papers/Designer_Babies.pdf> (accessed 9/25/21)

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#### Value: Human Dignity. Germline genetic alternations violate human autonomy and personal dignity

Alta Charo, professor of law and bioethics at University of Wisconsin, 2018
“Germline Engineering and Human Rights,” Published online by Cambridge University Press: 10 December 2018, <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/germline-engineering-and-human-rights/E9C98F9BE3054B32BC590EDEA988502A> (accessed 9/27/21)

A different objection to germline editing goes directly to how the emerging potential to make targeted biological changes in our children and descendants might affect someone's sense of autonomy and personal dignity. As noted in the report by the UK Nuffield Council on Bioethics: Choosing someone else's genetic endowment (other than probabilistically, through the choice of a reproductive partner) might be analogous to a kind of enslavement, except that the limitations on their freedom take the form of a biological characteristic rather than a physical constraint or psychological oppression. On such a view, the intervention offends against the essential dignity and nature of the person as a free and independent human being.10 In essence, this argument rests on a claim that germline editing interferes with what Joel Feinberg coined as a child's “right to an open future.”11 The concern here is that a child might feel less unique or less free simply by knowing that some of his or her traits were chosen or deleted by someone else, regardless of whether it was effective or done with the child's welfare in mind. To the extent that human rights are founded on notions of autonomy and dignity, this could be seen as a violation of those rights. Dignity, in particular, is often used to question whether germline editing ought to be permitted.

#### Criteria: Medical Determinism. Altering future individuals genomes opens a Pandora’s Box of ethical concerns

US National Library of Medicine, 2021
“What are the ethical issues surrounding gene therapy?,” Medline Plus, page last updated 12 April 2021, <https://medlineplus.gov/genetics/understanding/therapy/ethics/> (accessed 9/25/21)

Because gene therapy involves making changes to the body’s set of basic instructions, it raises many unique ethical concerns. The ethical questions surrounding gene therapy include: How can “good” and “bad” uses of gene therapy be distinguished? Who decides which traits are normal and which constitute a disability or disorder? Will the high costs of gene therapy make it available only to the wealthy? Could the widespread use of gene therapy make society less accepting of people who are different? Should people be allowed to use gene therapy to enhance basic human traits such as height, intelligence, or athletic ability? Current gene therapy research has focused on treating individuals by targeting the therapy to body cells such as bone marrow or blood cells. This type of gene therapy cannot be passed to a person’s children. Gene therapy could be targeted to egg and sperm cells (germ cells), however, which would allow the inserted gene to be passed to future generations. This approach is known as germline gene therapy. The idea of germline gene therapy is controversial. While it could spare future generations in a family from having a particular genetic disorder, it might affect the development of a fetus in unexpected ways or have long-term side effects that are not yet known. Because people who would be affected by germline gene therapy are not yet born, they can’t choose whether to have the treatment. Because of these ethical concerns, the U.S. Government does not allow federal funds to be used for research on germline gene therapy in people.

#### Observation 2: Banning germline genetic engineering key to prevent medical determinism that harms future generation’s human dignity

#### Scientists are calling on bans for germline genetic engineering because the science isn’t established and is in an ethical gray area

Alice Park, staff writer at TIME, 2019
“Experts Are Calling for a Ban on Gene Editing of Human Embryos. Here's Why They're Worried,” TIME, 13 March 2019, <https://time.com/5550654/crispr-gene-editing-human-embryos-ban/> (accessed 9/25/21)

When applied to human eggs, sperm and embryos, gene-editing technologies, of which CRISPR is the most precise, can alter the genes that people pass on to the next generation, and therefore modify the gene pool of the human species. Now, in the journal Nature, a group of 18 scientists from seven countries (Canada, China, France, Germany, Italy, New Zealand and the U.S.) have called for a voluntary moratorium on all studies involving gene editing of human eggs, sperm or embryos — so-called germline cells. Scientists proposed a similar moratorium in 2015, a few years after CRISPR was first described. But in the newer version, the scientists go further, asking not just individual researchers to agree to stop work on gene editing human germline cells, but calling on nations to create explicit laws or regulations to prevent such studies for now, and to develop a framework for allowing the studies when they deem they are safe and acceptable.

#### Germline genetic engineering makes “designer babies” inevitable

Nishith Desai Associates, June 2019
“Are we ready for Designer Babies? Analysis of law, policy, and ethics surrounding germline genetic engineering,” <http://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research_Papers/Designer_Babies.pdf> (accessed 9/25/21)

The Oxford Dictionary defines “designer baby” as “a baby whose genetic makeup has been selected in order to eradicate a particular defect, or to ensure that a particular gene is present.” A designer baby could, in theory, be free from genetic diseases such as haemophilia, cystic fibrosis or muscular dystrophy and many such diseases. The designer baby could also have traits and characteristics considered as preferred traits, such as height, eye color, musicality, intelligence etc. While the idea of a designer baby has till now been a far-fetched dream, it appears that it could now become a reality. A scientist in China has reportedly already modified the germline of live fetuses to make them HIV-free by genetic design. The twin girls whose genes were modified have already taken birth and a third such baby is on the way. A designer baby, therefore, may be a reality soon, made possible by human germline editing in India as well. However, the definition of “designer baby” does not fully indicate the consequences of creating a designer baby and hence they need to be discussed and understood. Germline editing, used in the creation of designer babies, is a form of genetic modification that involves changing genes in eggs, sperm, or very early embryos. This type of genome modification is heritable, meaning that the modified genes could appear not only in the offspring that result from the procedure, but also in the subsequent generations.

#### Germline genetic engineering is modern day eugenics that reifies inequality

Alta Charo, professor of law and bioethics at University of Wisconsin, 2018
“Germline Engineering and Human Rights,” Published online by Cambridge University Press: 10 December 2018, <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/germline-engineering-and-human-rights/E9C98F9BE3054B32BC590EDEA988502A> (accessed 9/27/21)

The feared consequences of using germline editing also includes a more profound version of stigmatization of disability, coupled with a fear of creating whole classes of superior and inferior people. It reflects a distrust in human action on a population-wide scale, borne of the tragic experiences with eugenics in the United States, Germany, Japan, and elsewhere. “The ultimate fear is of intentional modification of the human genome so as to produce individuals or entire groups endowed with particular characteristics and required qualities,” says the Explanatory Note to the Oviedo Convention. But if this fear is about exacerbating inequities or creeping toward biological caste systems, population biology mathematics quickly demonstrates that any change made in a limited number of cases now will have little effect on the global frequencies and every edit would be subject over the course of generations to the same forces that cause all traits to change over time, due to mutation and genetic recombination.

#### Germline genetic engineering would further entrench social inequality

Girard Kelly, MA in Applied Ethics and JD candidate, 2013
“Choosing the Genetics of Our Children: Options for Framing Public Policy,” Santa Clara High Technology Law Journal, Vol 30, January 2013, <https://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1581&context=chtlj> (accessed 9/27/21)

If the proliferation of RGBs [reproductive genetic biotechnologies] is only available to a select few who can afford them, the consequences will likely divide society and create two related problems: social inequality and unfairness.166 The division will likely further perpetuate social inequality and further entrench socio-economic stratification, because RGBs will initially only be available to those who can afford the elective procedures involved… Furthermore, because society will not be able to provide everyone with access to the same genetic enhancements the wealthy can purchase, there would continue to be an inherent inequality.174 Employers and educators are an example of a constituency that will likely face new challenges in determining fairness and equitability in regulating standards for enhanced versus unenhanced individuals.175 For example, studies show that people who are tall and physically attractive are more likely to be hired and promoted than people who are short or unattractive.176 Genetically enhanced individuals could have an unfair advantage in competition for scarce societal and economic resources such as aptitude-based employment, or academic acceptance, because genetic enhancement could improve characteristics that are arguably suited for success and well-being.177 Some commenters have even proposed futuristic scenarios in which unequal access to RGBs “eventually create[s] a political system dominated by a genetic aristocracy, or ‘genobility,’ that possesses a lock on wealth, privilege, and power.”

### Extensions – Value/Criteria

#### Multiple categories of ethical challenges to germline genetic engineering

Jing-Bao Nie and Alexander T.M. Cheung, bioethics researchers at the Hastings Center, 2019
“He Jiankui’s Genetic Misadventure, Part 3: What Are the Major Ethical Issues?,” The Hastings Center, 10 January 2019, <https://www.thehastingscenter.org/jiankuis-genetic-misadventure-part-3-major-ethical-issues/> (accessed 9/27/21)

In their single-minded venture of “producing” (shengchan, in their own word) the world’s first gene-edited babies, He Jiankui and his associates have posed numerous and daunting ethical challenges to China and the world. They can be mapped or identified through these four categories: typical problems related to research ethics; broader political, socio-cultural, and transcultural issues; fundamental ethical questions on the use of gene editing in human reproduction itself; and even more fundamental matters on the moral goals of science and technology. Different levels of ethical issues should be explored in an interconnected and interdisciplinary approach, but it is important to note that ethical soundness on one dimension does not mean moral justification on any other level or dimension.

### Extensions – Safety

#### Germline genetic engineering should be banned – mutations are irreversible and could affect future generations

Shuang Liu, researcher at the European Law Research Center, 2020
“Legal reflections on the case of genome-edited babies,” *Global Health Research and Policy* volume 5, Article number: 24 (2020), <https://ghrp.biomedcentral.com/articles/10.1186/s41256-020-00153-4> (accessed 9/25/21)

Human genome-editing is banned by guidelines, laws and regulations in most countries. However, the first criminal case on genome-edited babies was sentenced in China in 2019. In this commentary we discuss our legal reflections on this case. Genome-editing on healthy embryos of human may lead to irreversible mutations and serious consequences on the heredity of future generations, while its long-term safety is unpredictable. A full set of laws, regulations along with the guidelines should be formulated to penalize genome-editing behaviors and prevent similar negative events in the future. More effective and binding mechanisms should be constructed and implemented among different countries. A collaborative network should be strengthened for better global registry and surveillance of human genome-editing technologies and research.

#### Germline genetic engineering technologies are dangerous and prone to errors

Jennifer Gumer, bioethics researcher for the Hastings Center, 2019
“Why Human Germline Editing Might Never Be Legal in the U.S.,” The Hastings Center, <https://www.thehastingscenter.org/why-human-germline-editing-might-never-be-legal-in-the-u-s/> (accessed 9/27/21)

First, CRISPR research has revealed relatively high frequencies of off-target edits (meaning that an untargeted gene is edited) and mosaicism (not all cells of an embryo are successfully edited) with the potential for significant deleterious effects. Risk of such inaccuracies cannot be completely ruled out in any embryo intended for implantation. Because a cell must be removed from an embryo in order to be sequenced, only a subset of an embryo’s cells can be tested for off-target edits and mosaicism. It is therefore practically impossible to confirm that a child produced from germline editing will be free from the more than minimal risks associated with these inaccuracies. Furthermore, given the nascence of CRISPR gene-editing combined with our relative lack of understanding of the complexities of the human genome, there may be other, yet-undiscovered, greater-than-minimal risks associated with germline editing. It’s unclear how animal and lab testing could successfully identify all such risks before human trials are initiated.

### Extensions – Not Banned Now

#### Germline genetic engineering isn’t officially banned in the US

Jocelyn Kaiser, staff writer for Science magazine, 2019
“Update: House spending panel restores U.S. ban on gene-edited babies,” Science Magazine, 4 June 2019, <https://www.science.org/news/2019/06/update-house-spending-panel-restores-us-ban-gene-edited-babies> (accessed 9/25/21)

A Democrat-led spending panel in the U.S. House of Representatives has dropped a provision that banned embryo editing with the intention of creating a baby. The draft bill is still moving through the legislative process, however, and Republicans will likely push to restore the language. The ban was first added to the law that funded the U.S. government in 2016. It bars the Food and Drug Administration (FDA) from considering any clinical trial application "in which a human embryo is intentionally created or modified to include a heritable genetic modification." Although a different "rider" bars the National Institutes of Health from funding human germline editing—or the genetic modification of sperm, eggs, or embryos—such work is permissible with private funding. However, researchers would need FDA approval for a clinical trial. A 2020 draft spending bill approved on 23 May by the House appropriations subcommittee that funds FDA does not contain the rider, as CQ first reported yesterday. A Democratic aide speaking on background told ScienceInsider: "The provision was dropped because it was inserted in private 3 years ago and has never been subject to public debate. We believe this provision could limit important scientific research and, if Congress chooses to prohibit such research, that should be done in the light of day." The rider has served as a de facto U.S. ban on germline editing to create a baby, which is explicitly barred in some countries.

### A2 – Genetic Diseases

#### Other options for genetic diseases

Jennifer Gumer, bioethics researcher for the Hastings Center, 2019
“Why Human Germline Editing Might Never Be Legal in the U.S.,” The Hastings Center, <https://www.thehastingscenter.org/why-human-germline-editing-might-never-be-legal-in-the-u-s/> (accessed 9/27/21)

For example, the vast majority of couples affected by genetic disease can produce and selectively implant some amount of healthy embryos using IVF and preimplantation genetic diagnosis. The relatively few couples who cannot produce healthy embryos, however, still have other options. Specifically, they can 1) use gamete donation to create a healthy child that is their partial genetic relation; 2) adopt a child; 3) or choose not to become parents. The unique benefit of germline editing over these existing options is to provide such a couple with the ability to have a genetically related child they likely otherwise would not have had. This benefit accrues to the parents, not the child-to-be. The more than minimal risk that germline editing presents to the child-to-be is not outweighed by a direct benefit as required by relevant law. Therefore, even putting aside the many other ethical concerns associated with germline editing, it’s unclear that it could proceed in the U.S. under current law—a fact conspicuously absent from the CRISPR debates.

#### Germline genetic engineering not necessary medically

Jing-Bao Nie and Alexander T.M. Cheung, bioethics researchers at the Hastings Center, 2019
“He Jiankui’s Genetic Misadventure, Part 3: What Are the Major Ethical Issues?,” The Hastings Center, 10 January 2019, <https://www.thehastingscenter.org/jiankuis-genetic-misadventure-part-3-major-ethical-issues/> (accessed 9/27/21)

It is not hard to see how scientific integrity has been tarnished. As Chinese people have quickly realized, the primary goals of He’s genetic experiments, conducted in secrecy and purposefully announced via YouTube on the eve of the Second International Summit on Human Genome Editing are not so much to advance science and relieve patients’ suffering, but to maximize sentimentalism, win fame, and, even worse, consolidate and expand his gene commodification. Against what He himself has claimed, the aim of his experiments was not to treat any serious genetic disease. Rather, He sought to use the gene-editing tool CRISPR-Cas9 to create a 32-base pair deletion in the CCR5 gene, a genetic variant that confers increased resistance to HIV infection. However, the transmission of HIV to a child can be effectively prevented by other safer measures, such as washing the infected father’s sperm before in vitro fertilization—a step He’s team had in fact performed, which essentially eliminated any supposed “medical necessity” of the experiment at the outset. In addition, the truncated CCR5 variant may increase one’s susceptibility to other pathogens such as West Nile Virus. He’s “gene surgery” has therefore only posed a number of foreseeable and unforeseeable risks, to the babies themselves and their future progeny, without providing any obvious medical benefit. He’s genetic misadventure also holds little scientific merit and reflects poorly designed experimentation.

### A2 – Parental/Reproductive Freedom

#### Socio-bioethics must go beyond individualistic framing

Jing-Bao Nie and Alexander T.M. Cheung, bioethics researchers at the Hastings Center, 2019
“He Jiankui’s Genetic Misadventure, Part 3: What Are the Major Ethical Issues?,” The Hastings Center, 10 January 2019, <https://www.thehastingscenter.org/jiankuis-genetic-misadventure-part-3-major-ethical-issues/> (accessed 9/27/21)

He’s historic genetic misadventure constitutes a historic violation of scientific integrity and morality. The unethicalness is absolutely not just about “the paperwork.” Rather, one should marvel at He’s ethical, if not scientific, “genius.” For He and his associates have given the world a perfect paradigm case to demonstrate in most lively ways on how a scientific project can breach almost every ethical norm of biomedical research. Moreover, the epic scientific misconduct prompts studies of the complicated political and sociocultural context of gene-editing technologies and urges the examination of the fundamental moral matters regarding the application of science and technology in general. To address the challenges of human gene editing, it is imperative not only to reinforce established bioethical norms but also to advance a “new socio-bioethics” by moving beyond the mainstream largely individualistic modes of bioethical inquiries.

#### Germline genetic engineering can’t enhance human traits, just change basic features which is eugenics

Girard Kelly, MA in Applied Ethics and JD candidate, 2013
“Choosing the Genetics of Our Children: Options for Framing Public Policy,” Santa Clara High Technology Law Journal, Vol 30, January 2013, <https://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1581&context=chtlj> (accessed 9/27/21)

Finally, opponents question the post-human agenda on biological and safety grounds. In order for genetic engineering to be done, “one would first need to identify all (or enough) of the specific variants of genes whose presence (or absence) correlates with certain desired traits: higher intelligence, better memory, perfect pitch, calmer temperament, sunnier disposition, greater ambitiousness, etc.”153 These socially normative “desired traits” of parents for their unborn children, even if they were discovered, are genetic traits heavily influenced by the external environment, which “are most certainly polygenic, that is, traits (or phenotypes) that depend on specific genes or their variants at several, perhaps many, distinct loci.”154 The complexity of these polygenic and epigenetic gene interactions would essentially prevent parents from choosing desired traits beyond simple single gene interactions such as height, eye, or hair color.155 Furthermore, because many of the genes involved in the expression of normal traits are “pleiotropic—that is, they influence many traits, not just one—even a properly inserted gene introduced to enhance a particular trait would often have multiple effects, not all of them for the better.”156 For these reasons, opponents conclude that any attempt to genetically modify or enhance normal “healthy” gametes or embryos would be unsafe, infeasible, and ethically suspect.

## Negative

### 1NC

#### Scientific advancements in medicine are made to improve the health of future generations. Because of this, I oppose the proposition that: The United States ought to ban the use of germline genetic engineering in humans.

#### Observation 1: Resolutional Analysis

#### Definitions:

#### Ban means to make illegal

Merriam-Webster, 2021
“ban,” <https://www.merriam-webster.com/dictionary/ban> (accessed 9/25/21)

: to prohibit especially by legal means

#### Value: Liberalism. Reproductive choices are a necessary freedom in a liberal, rights-based society

Girard Kelly, MA in Applied Ethics and JD candidate, 2013
“Choosing the Genetics of Our Children: Options for Framing Public Policy,” Santa Clara High Technology Law Journal, Vol 30, January 2013, <https://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1581&context=chtlj> (accessed 9/27/21)

Some proponents of RGBs [reproductive genetic biotechnologies] argue that parents should be free to choose the genetic disposition of their children. John Robertson, who takes a moderate perspective on genetic engineering,98 classifies procreative liberty proponents of RGBs as either radical libertarians or modern traditionalists.99 Modern traditionalists hold “reproductive choice in a liberal, rights-based society is a basic freedom, including the use of genetic and reproductive technologies that are helpful in having healthy, biologically related offspring.”100 Radical libertarians would arguably support any form of genetic modification regardless of its purpose,101 based on the fundamental principles of individual liberty, autonomy, and freedom, whereas modern traditionalists’ “acceptance of reproductive and genetic technologies . . . exists only insofar as they aid the task of successful reproduction, and do not directly harm offspring, families, women, society, or others.”102 This perspective balances the benefits of non-medical genetic selection against the perceived costs and safety risks involved in such a selection. Therefore, justification for positive genetic modification of our children’s genes, from a modern traditionalist perspective, would depend on the parent’s reasons and whether it occurs as a result of therapeutic alteration or non-therapeutic alteration.

#### Criteria: Reproductive-parental freedom. Germline genetic engineering access is a parental and procreative right that should be free from government interference

Tandice Ossareh, J.D. candidate at Columbia Law School, 2017
“WOULD YOU LIKE BLUE EYES WITH THAT? A FUNDAMENTAL RIGHT TO GENETIC MODIFICATION OF EMBRYOS,” Columbia Law Review, Vol 117, No 3, <https://columbialawreview.org/content/would-you-like-blue-eyes-with-that-a-fundamental-right-to-genetic-modification-of-embryos/> (accessed 9/28/21)

The Constitution has long protected the rights of individuals to procreate and parent, free from government intrusion. But as new technologies stretch the boundaries of what it means to create a family, the scope of these rights have come into question. Specifically, modern advances in genetic modification will soon allow parents to make direct modifications to particular embryos. The possibility of such advances gives rise to questions about how to regulate the making of “designer babies.” This Note argues the right to access genetic modification technology falls squarely within the framework established by the existing line of cases extending to individuals the right to build their families in a meaningful way, on their own terms, without government interference. Anticipating state regulation limiting access to these new technologies, this Note finds the Supreme Court would likely have to strike down such regulations as violating the Due Process Clause. As such, parents should have a protected right to make at least therapeutic modifications to restore the health of an embryo, if not enhancement modifications to enhance particular traits of the future child. Resting at the salient intersection of parental and procreative autonomy, this Note seeks to delineate the exact parameters of a cognizable right to genetic modification.

#### Observation 2: Banning germline genetic engineering in humans violates the liberal right to reproductive-parental freedom

#### Experts believe genome editing can be one of the most promising scientific advancements of humankind

UNESCO, no date
“UNESCO panel of experts calls for ban on “editing” of human DNA to avoid unethical tampering with hereditary traits,” UNESCO, <https://en.unesco.org/news/unesco-panel-experts-calls-ban-editing-human-dna-avoid-unethical-tampering-hereditary-traits> (accessed 9/25/21)

At the close of a meeting at UNESCO in Paris, independent experts of the Organization’s International Bioethics Committee (IBC) published a report “Updating its Reflection on the Human Genome and Human Rights.” In it, the experts argue that “gene therapy could be a watershed in the history of medicine and genome editing is unquestionably one of the most promising undertakings of science for the sake of all humankind.” But the IBC report cautions that “this development seems to require particular precautions and raises serious concerns, especially if the editing of the human genome should be applied to the germline and therefore introduce hereditary modifications, which could be transmitted to future generations” The IBC therefore called for a moratorium on this specific procedure, at its meeting, on the human genome and human rights. Recent advances have opened the door to genetic screening and testing for inherited diseases, gene therapy, the use of embryonic stem cells in medical research and the possibility of cloning and genetic “editing” for both medical and non-medical ends. “Interventions on the human genome should be admitted only for preventive, diagnostic or therapeutic reasons and without enacting modifications for descendants,” says the IBC, arguing that the alternative would “jeopardize the inherent and therefore equal dignity of all human beings and renew eugenics.”

#### The science works and is a breakthrough in preventing genetic disease and research in stem cell regenerative medicine

Girard Kelly, MA in Applied Ethics and JD candidate, 2013
“Choosing the Genetics of Our Children: Options for Framing Public Policy,” Santa Clara High Technology Law Journal, Vol 30, January 2013, <https://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1581&context=chtlj> (accessed 9/27/21)

Although the science and technology required to enable parents to choose the genetic traits and characteristics of their children continues to remain speculative, researchers involved in recent genetic modification studies of mice and primates believe scientific breakthroughs are inevitably pushing us closer to germline modification in humans. Recent experimental breakthroughs demonstrating the technological feasibility of germline modification in mice have shown researchers can use sperm and eggs grown from Induced Pluripotent Stem Cells (iPSCs) for reproduction—a breakthrough theorized by some scientists involved in the project that could be applied not just to mice, but in other mammals as well, including humans. In a second recent scientific breakthrough in germline modification, a new generation of genetically modified mice were developed using Haploid Embryonic Stem Cells (haESCs); a technique that researchers speculated could be used in the future to correct genetic diseases in germ cells not just of mice, but of humans, too. Finally, biologists have recently succeeded in cloning human stem cells by reprogramming somatic cells into pluripotent embryonic stem cells (ESCs) through somatic cell nuclear transfer (SCNT). This groundbreaking technique produces human stem cells without the ethical implications that accompany the creation and destruction of human embryos—which could have significant implications for research of pluripotent stem cell regenerative medicines. These scientific breakthroughs illustrate proponents’ arguments that IGM is not only scientifically feasible, but could also be used to allow couples to avoid passing on serious genetic diseases, and have healthy offspring that is genetically related to both parents.

### Extensions – Scientific Advancement

#### Germline genetic engineering can radically address human health issues like genetic diseases

National Academy of Science, 2017
“With Stringent Oversight, Heritable Human Genome Editing Could Be Allowed for Serious Conditions,” The National Academies of Science, Engineering, and Medicine, 14 February 2017, <https://www.nationalacademies.org/news/2017/02/with-stringent-oversight-heritable-human-genome-editing-could-be-allowed-for-serious-conditions> (accessed 9/27/21)

Genome editing is not new. But new powerful, precise, and less costly genome editing tools, such as CRISPR/Cas9, have led to an explosion of new research opportunities and potential clinical applications, both heritable and non-heritable, to address a wide range of human health issues. Recognizing the promise and the concerns related to this technology, NAS and NAM appointed a study committee of international experts to examine the scientific, ethical, and governance issues surrounding human genome editing. Human genome editing is already widely used in basic research and is in the early stages of development and trials for clinical applications that involve non-heritable (somatic) cells. These therapies affect only the patient, not any offspring, and should continue for treatment and prevention of disease and disability, using the existing ethical norms and regulatory framework for development of gene therapy. Oversight authorities should evaluate safety and efficacy of proposed somatic applications in the context of the risks and benefits of intended use. However, there is significant public concern about the prospect of using these same techniques for so-called “enhancement” of human traits and capacities such as physical strength, or even for uses that are not possible, such as improving intelligence. The report recommends that genome editing for enhancement should not be allowed at this time, and that broad public input and discussion should be solicited before allowing clinical trials for somatic genome editing for any purpose other than treating or preventing disease or disability. “Human genome editing holds tremendous promise for understanding, treating, or preventing many devastating genetic diseases, and for improving treatment of many other illnesses,” said Alta Charo, co-chair of the study committee and Sheldon B. Lubar Distinguished Chair and Warren P. Knowles Professor of Law and Bioethics, University of Wisconsin-Madison.

#### A US ban on germline genetic engineering only cedes this scientific innovation to other nations

Alex Pearlman, news reporter for Vice, 2016
“Scientists Argue the US Ban on Human Gene Editing Will Leave It Behind,” Vice News, 4 August 2016, <https://www.vice.com/en/article/nz7dp8/scientists-argue-the-us-ban-on-human-gene-editing-will-leave-it-behind> (accessed 9/25/21)

As the biotech revolution accelerates globally, the US could be getting left behind on key technological advances: namely, human genetic modification. A Congressional ban on human germline modification has "drawn new lines in the sand" on gene editing legislation, argues a paper published today in Science by Harvard law and bioethics professor I. Glenn Cohen and leading biologist Eli Adashi of Brown University. They say that without a course correction, "the United States is ceding its leadership in this arena to other nations." Germline gene modification is the act of making heritable changes to early stage human embryos or sex cells that can be passed down to the next generation, and it will be banned in the US. This is different from somatic gene editing, which is editing cells of humans that have already been born. The ban, added by the House of Representatives as a rider to the fiscal year 2016 budget, could have far-reaching implications if it continues to be annually renewed, according to the authors. It "undermines ongoing conversations on the possibility of human germline modification" and also affects "ongoing efforts by the FDA [Food and Drug Administration] to review the prevention of mitochondrial DNA diseases," including some kinds of hearing and vision impairments, among other serious illnesses that tend to develop in young children.

### Extensions – GGE Inevitable and Good

#### Germline genetic engineering is inevitable, and medically and morally valuable

H. Tristram Engelhardt Jr., professor of philosophy at Rice University, 2002
“Germline engineering: The moral challenges,” American Journal of Medical Genetics, 13 February 2002, <https://onlinelibrary.wiley.com/doi/10.1002/ajmg.10214> (accessed 9/27/21)

Not only is the use of germline genetic engineering likely in the long run to be inevitable, there are also no convincing secular moral grounds to forbid this technology in principle. Instead, the general secular moral constraints on the use of germline genetic engineering are either procedural or without predetermined content. Nor can one develop a coherent distinction between eliminating disease and enhancing human abilities. At best, in secular morality one can establish the principle to proceed with care, though the invocation of the precautionary principle argues as much in favor of the development of germline genetic engineering as against its use. Because germline genetic engineering, by eliminating certain genetic defects, offers the prospect of decreasing human suffering and decreasing the use of prenatal diagnosis and abortion, there is an obligation, all else being equal, to change the human genome. In a post-modern world, humans face the challenge of directing their own evolution, although they share no common understanding of human destiny and purpose. Such understandings, though available within religious contexts, are not available to secular bioethics

#### Germline genetic engineering inevitable, only a question of how to make it the most ethical

Ignacio Macpherson et al, professors from universities in Spain, 2019
“Ethical Challenges of Germline Genetic Enhancement,” Frontiers in Genetics, 3 September 2019, <https://www.frontiersin.org/articles/10.3389/fgene.2019.00767/full> (accessed 9/28/21)

It is probable that the desire for specific human enhancement will become a reality and, consequently, some agents will implement the germline’s genetic enhancement in society. For this reason, we consider essential to create effective expert panels and committees with society’s feedback (Kaebnick, 2017) that could elaborate global normative documents, rooted and established on universal ethical principles (Ishii, 2014; Lyon, 2017; De Wert et al., 2018). The information about the creation of enhanced twins in China (Regalado, 2018) reinforces our conviction about the need to put forward the underlying reasons that support future legislation aimed at prohibiting or allowing enhancements. Otherwise, if the different reasons are circumstantial without a deep foundation, the laws will be ineffective. We propose the precautionary principle as a means to navigate ethics’ uncertainties and as the point of departure to assess moral enhancement. Certainly, an abusive application of the precautionary principle would lead to its ineffectiveness. Conversely, that precautionary attitude may improve the objectives and the means regardless whether it is directed to protect the autonomy of adults, the global human welfare or the dignity of the individual. We think that these concepts may structure and configure any advance in germline genetic enhancement technologies.

### A2 – GGE Harms Human Dignity/Rights

#### Germline genetic engineering doesn’t diminish human dignity or rights

Alta Charo, professor of law and bioethics at University of Wisconsin, 2018
“Germline Engineering and Human Rights,” Published online by Cambridge University Press: 10 December 2018, <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/germline-engineering-and-human-rights/E9C98F9BE3054B32BC590EDEA988502A> (accessed 9/27/21)

The preamble to the Oviedo Convention speaks of the need to “respect the human being both as an individual and as a member of the human species” and to recognize “the importance of ensuring the dignity of the human being.” Prohibiting germline editing is not necessary to respond to these goals. While attention must be paid to protect the well-being and open future of the child and of future generations, germline editing may offer yet another way to be responsible midwives to those who come next. Understanding that homo sapiens is a species with blurry boundaries, and that we carry within us genetic traits that trace back to Neanderthals and even far more primitive life forms, should make us question whether germline editing in any way undermines the basis for according human rights, and indeed, whether being human is essential to human rights at all.

#### Germline genetic engineering would not end life as we know it, but usher in evolutionary post-humanism

Girard Kelly, MA in Applied Ethics and JD candidate, 2013
“Choosing the Genetics of Our Children: Options for Framing Public Policy,” Santa Clara High Technology Law Journal, Vol 30, January 2013, <https://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1581&context=chtlj> (accessed 9/27/21)

Many proponents of genetic engineering suggest if humankind were to adopt genetic engineering technologies that enable parents to choose the genetic characteristics of their children, and were to take the science a step further—to choose desirable genetic enhancements and abilities, such as sharper eyesight, better hearing, stronger immune systems, or greater intelligence—would the child still be considered human?114 When framing humankind’s existence and identity in this continually evolving context, one must accept that due to constantly changing somatic and germ-line mutations, the genetic composition of who we are today, is not who we were yesterday. This reconceptualization of existence is necessary to understand the post-humanist movement’s principles as humankind looks to new frameworks to define life. Ray Kurzweil attempts to answer the question of identity in that, “I am rather like the pattern that water makes in a stream as it rushes past the rocks in its path. The actual molecules of water change every millisecond, but the pattern persists for hours or even years.”115 This poignant example forces us to re- examine the importance of our ideological belief that we define our existence not by the atoms or particles that make our bodies, but rather the pattern of our life form that existentially creates the essence of our being.

### A2 – GGE Unsafe

#### The National Academy of Science supports the use of germline genetic engineering within ethical scientific conditions

Nishith Desai Associates, June 2019
“Are we ready for Designer Babies? Analysis of law, policy, and ethics surrounding germline genetic engineering,” <http://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research_Papers/Designer_Babies.pdf> (accessed 9/25/21)

In 2017 however, the National Academy of Science (“NAS”), a private not-for-profit organization which provides advice to the US Government on matters of science and technology, published a report titled, “Human Genome Editing Science, Ethics and Governance” (“Report”) which states that given both the technical and societal concerns, there is a need for caution in any move towards germ line editing. However, that caution does not mean prohibition. The Report gave a cautious green light to germ-line editing under certain conditions which include: i. absence of reasonable alternatives; ii. restriction to preventing a serious disease or condition; iii. restriction to editing genes that have been convincingly demonstrated to cause or strongly predispose to that disease or condition; iv. restriction to converting such genes to versions that are prevalent in the population and are known to be associated with ordinary health with little or no evidence of adverse effects; v. availability of credible pre-clinical and/or clinical data on risks and potential health benefits of the procedures; vi. during the trial, ongoing, rigorous oversight of the effects of the procedure on the health and safety of the research participants; vii. comprehensive plans for long-term multigenerational follow-up that still respect personal autonomy; viii. maximum transparency consistent with patient privacy; ix. continued reassessment of both health and societal benefits and risks, with broad, ongoing participation and input from the public; and x. reliable oversight mechanisms to prevent extension to uses other than preventing a serious disease or condition.

#### Germline genetic engineering could be safe and beneficial with US approval

Jennifer Gumer, bioethics researcher for the Hastings Center, 2019
“Why Human Germline Editing Might Never Be Legal in the U.S.,” The Hastings Center, <https://www.thehastingscenter.org/why-human-germline-editing-might-never-be-legal-in-the-u-s/> (accessed 9/27/21)

Even the signatories of the moratorium, however, suggest that CRISPR might one day be safe enough for ethical, clinical use on the germline. What would it take for the first case of germline editing to proceed under applicable U.S. law and ethical standards? Germline editing would be regulated as a gene therapy by the Food and Drug Administration. To comply with the relevant regulations, germline editing must undergo clinical testing to demonstrate safety and efficacy and win FDA approval before coming to market. Currently, federal law prevents the FDA from reviewing or approving any application involving manipulated human embryos. However, if and when this ban is lifted, the first case of germline editing would take place in the context of a clinical trial and therefore would be subject to the laws and ethical standards applicable to research.