



**USE GENE EDITING TO  
MAKE BETTER BABIES**

INTELLIGENCE SQUARED U.S. DEBATE  
BRIEFING BOOK

“Use Gene-Editing to Make Better Babies”

February 17, 2022

Use Gene Editing to Make Better Babies



# USE GENE EDITING TO MAKE BETTER BABIES

MODERATOR  
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DEBATERS

FOR THE MOTION

AMY WEBB, FUTURIST

GEORGE CHURCH, GENETICIST

AGAINST THE MOTION

MARCY DARNOVSKY, AUTHOR & POLICY ADVOCATE

FRANCOISE BAYLIS, BIOETHICIST

## DESCRIPTION

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A genetic disease runs in your family. Your doctor tells you that, should you wish to have a child, that child is likely to also carry the disease. But a new gene-editing technology could change your fate. It could ensure that your baby is — and remains — healthy. Even more, it could potentially make sure your grandchildren are also free of the disease. What do you do? Now, imagine it's not a rare genetic disorder, but general illness, or eye color, or cognitive ability, or athleticism. Do you opt into this new world of genetically edited humans? And what if it's not just you. What your friends, neighbors, and colleagues are also embracing this genetic revolution? Right now, science doesn't give you that choice. But huge advancements in CRISPR technology are making human gene editing a reality. In fact, in 2018, a Chinese scientist announced the first genetically modified babies; twin girls made to resist HIV, smallpox, and malaria. The promise of this technology is clear. But gene editing is not without its perils. Its critics say the technology is destined to exacerbate inequality, pressure all parents (and nations) into editing their children to stay competitive, and meddle with the most basic aspect of our humanity: our DNA. In this context, we ask the question: Should we use gene editing to make better babies?

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## FROM THE DEBATERS

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### FOR THE MOTION: Amy Webb

Amy Webb is a futurist who advises world leaders across fields. Founder of the Future Today Institute, a leading foresight and strategy firm that helps leaders and their organizations prepare for complex features, Amy pioneered a data-driven, technology-led foresight methodology that is now used within hundreds of organizations. She is a professor of strategic foresight at the NYU Stern School of Business, and is a member of the Council on Foreign Relations, Bretton Woods Committee, and the World Economic Forum. She is the author of several popular books, including “The Big Nine: How the Tech Titans and Their Thinking Machines Could Warp Humanity,” and “The Signals Are Talking: Why Today’s Fringe Is Tomorrow’s Mainstream.” Her latest book, “The Genesis Machine,” explore the futures of synthetic biology.

**ARTICLE:** [Crispr makes it clear: The US needs a biology strategy, and fast](#)

By Amy Webb | May 11, 2017 | Wired

*“Crispr, which allows scientists to edit precise positions on DNA using a bacterial enzyme, is already transforming cancer treatment, preventing the spread of disease, and solving global famine. Its trajectory necessarily involves government agencies and commissions, our elected officials, and the courts — and none of them are prepared for what’s coming.”*

**VIDEO:** [Amy Webb | Synthetic Biology](#)

By Amy Webb | April 7, 2021 | World Economic Forum

**ARTICLE:** [Crispr makes it clear: The US needs a biology strategy, and fast](#)

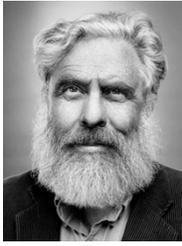
By Amy Webb | May 11, 2017 | Wired

*“We need to acknowledge the geopolitical advantages that some countries might try for by elevating their population’s intelligence and physical traits. But the thought of making pregnancy easier for people who really want to become parents is something we should be embracing.”*

**ARTICLE:** [Welcome to the \(Synthetic\) Meatspace](#)

By Amy Webb | December 1, 2021 | Wired

*“Biology is the most important technology of this century. However, unlike digital or inorganic physical technology, which tends to degrade or to seize up if not maintained, biology often self-sustains, even when we don’t want it to.”*



**FOR THE MOTION: George Church**

George Church leads Synthetic Biology at the Wyss Institute is professor of genetics at Harvard Medical School, and professor of health science and technology at Harvard and the Massachusetts Institute of Technology. George is widely recognized for his innovative contributions to genomic science and his many pioneering contributions to chemistry and biomedicine. He is director of the U.S. Department of Energy Technology Center and director of the National Institutes of Health Center of Excellence in Genomic Science.

**ARTICLE:** [A Harvard geneticist's goal: to protect humans from viruses, genetic diseases, and aging](#)  
By Scott Pelley | December 8, 2019 | CBS News

*"I completely agree that we need to be very cautious. And the more powerful, or the more rapidly-moving the technology, the more cautious we need to be, the bigger the conversation involving lots of different disciplines, religion, ethics, government, art, and so forth. And to see what it's unintended consequences might be."*

**VIDEO:** [George Church, Ph.D. speaks to the future of genetics and gene editing](#)  
By George Church | May 2, 2019 | Labroots

**ARTICLE:** [George Church has a wild idea to upend evolution. Here's your guide](#)  
By Sharon Begley | May 16, 2016 | Stat News

*"When the scientific consensus was moving against engineering the human germline...the idea sounded fine to him. After all, he noted, making such genetic tweaks could potentially cure entire families of devastating inherited illnesses, such as Huntington's once and for all."*

**VIDEO:** [George Church talks age reversal and woolly mammoth DNA](#)  
By Walter Isaacson | December 5, 2019 | PBS

**VIDEO:** [Our DNA: What's Next & How Far Should We Go?](#)  
By George Church | May 22, 2019 | Royal Canadian Institute for Science

AGAINST THE MOTION: Marcy Darnovsky



Marcy Darnovsky, PhD, speaks and writes widely on the politics of human biotechnology, focusing on their social justice and public interest implication. Her articles have appeared in The New York Times, Nature, The Guardian, Los Angeles Times, Wall Street Journal, Harvard Law and Policy Review, Democracy, New Scientist, and many others. She has appeared on dozens of television, radio, and online news shows and has been interviewed and cited in hundreds of news and magazine articles. She has worked as an organizer and advocate in a range of environmental and progressive political movements, and taught courses at Sonoma State University and at California State University East Bay. Her Ph.D. is from the History of Consciousness program at the University of California, Santa Cruz.

**VIDEO:** [Use Gene Editing to Treat Patients, Not DDesign Babies](#)

By Marcy Darnovsky | January 2020 | TED

**ARTICLE:** [The wrong way to make policy about heritable genome modification](#)

By Marcy Darnovsky | May 29, 2019 | The Hill

*“To be sure, slipping a provision into a massive budget bill without thorough debate is a decidedly suboptimal way to craft policy, especially about such a profoundly consequential matter. But so is precipitously removing or altering it. To do this now, after the ‘CRISPR babies,’ would greatly compound the problem.”*

**ARTICLE:** [Gene-edited babies: no one has the moral warrant to go it alone](#)

By Marcy Darnovsky & Katie Hasson | November 27, 2018 | The Guardian

*“The reckless actions of on scientist cannot and should not pre-empt the global public conversation over whether to proceed with reproductive germline editing, as the procedure is known.”*

**ARTICLE:** [Genetically modifying future children isn't just wrong. It would harm all of us](#)

By Marcy Darnovsky | July 17, 2018 | The Guardian

*“Sadly, the Nuffield Council on Bioethics has given its blessing to an unneeded and societally dangerous biotechnology, one that could be leveraged by privileged elites seeking purported genetic improvements to ensure that their children are treated as superior to the rest of us.”*

AGAINST THE MOTION: Françoise Baylis



Françoise Baylis is a philosopher whose innovative work in bioethics, at the intersection of policy and practice, has stretched the very boundaries of the field. Her current research focuses on heritable human genome modification, the body economy, assisted human reproduction, and research involving women. Baylis contributes to national policy-making via government research contracts, membership on national committees and public education. This work — all of which is informed by a strong commitment to the common good — focuses largely on issues of social justice. She is a university research professor, NTE Impact Ethics, faculty of medicine at Dalhousie University.

**ARTICLE:** [Equity and access need to be at the forefront of innovation in human genome editing](#)

By Françoise Baylis & Jantina de Vries | July 12, 2021 | The Conversation

*“As members of the WHO Expert Advisory, we appreciate the challenges in moving forward with human genome editing technology, given our commitment to ensure that this is not just personalized medicine for an elite few.”*

**ARTICLE:** [Scientific ethics and gene edited babies](#)

By Françoise Baylis | January 5, 2020 | Boston Globe

*“I call on scientists to carefully reflect on what kind of world we want to live in and if heritably human genome editing research can help us build that world. The pivotal ethical question we must address is not how but whether to embrace the project of genetically altering our descendants.”*

**ARTICLE:** [Bioethicist calls for moratorium on 'designer babies'](#)

By Nick Budnick | February 18, 2021 | Pamplin Media Group

*“The question of whether genetically engineering human beings should continue without restrictions or regulation is too important [Baylis] said, to be left to the scientists doing the work.”*

**ARTICLE:** [Before heritable genome editing, we need slow science and dialogue 'within and across nations'](#)

By Françoise Baylis | September 23, 2019 | Stat News

*“To this end, we need slow science. Science needs time to think and to digest. Time is also needed to promote ethics literacy and to facilitate broad societal consensus — where the goal is not unity, not unanimity. Decision-making by consensus is about engaged, respectful dialogue and deliberation...”*

## GENERAL RESEARCH

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### BACKGROUND & HISTORY

**ARTICLE:** [CRISPR babies: when will the world be ready?](#)

By Heidi Ledford | June 19, 2019 | Nature

*“Public opinion on gene editing to prevent disease is largely positive. But Carroll’s reticence is common among scientists.”*

**ARTICLE:** [Curing cancer, designer babies, supersoldiers: how will gene-editing change us?](#)

By Sherryn Gorch | July 4, 2021 | The Sydney Morning Herald

*“Still, the technology comes with significant ethical implication, including ensuring it does not have unintended negative consequences, that it is used equitably, and that a consensus is reached on where to draw the line in the technology’s use.”*

**ARTICLE:** [The future of CRISPR is now](#)

By Bridget Balch | December 2, 2021 | Association of American Medical Colleges

*“Still, the technology comes with significant ethical implication, including ensuring it does not have unintended negative consequences, that it is used equitably, and that a consensus is reached on where to draw the line in the technology’s use.”*

### FOR

**ARTICLE:** [What gene editing can do for humankind](#)

By Walter Isaacson | February 19, 2021 | Wall Street Journal

*“But the advances in CRISPR technology, combined with the havoc wrought by the Covid-19 pandemic, have pushed me to be more open to gene editing. I now see the promise of CRISPR more clearly than the peril.”*

**ARTICLE:** [Be it resolved: Let's engineer a better human being](#)

Munk Debates

*“But the advances in CRISPR technology, combined with the havoc wrought by the Covid-19 pandemic, have pushed me to be more open to gene editing. I now see the promise of CRISPR more clearly than the peril.”*

## Use Gene Editing to Make Better Babies

**ARTICLE:** [Editing the DNA of human embryos could protect us from future pandemics](#)

By Yusef Paolo Rabiah | December 7, 2020 | The Conversation

*“But with the COVID-19 pandemic showing just how vulnerable human beings are to disease, is it time to consider moving ahead with [germline genome editing] more quickly?”*

## AGAINST

**ARTICLE:** [CRISPR gene editing can cause unwanted changes in human embryos, study finds](#)

By Katherine J. Wu | October 31, 2020 | The New York Times

*“A powerful gene-editing tool called Crispr-Cas9, which this month nabbed the Nobel Prize in Chemistry for two female scientists, can cause serious side effects in the cells of human embryos, prompting them to discard large chunks of their genetic material, a new study has found.”*

**ARTICLE:** [New technologies may have already introduced genetic errors to the human gene pool. how long will they last? And how could they affect?](#)

By Zaria Gorvett | April 12, 2021 | Future

*“In fact, there have been no shortage of surprises in the field. From the rabbits altered to be leaner that inexplicably ended up with much longer tongues to the cattle tweaked to lack horns that were inadvertently endowed with a long stretch of bacterial DNA in their genomes... its past is riddled with errors and misunderstandings.”*

**ARTICLE:** [The Dark Side of CRISPR](#)

By Sandy Sufian & Rosemarie Garland-Thomson | February 16, 2021 | Scientific American

*“As disability studies scholars and women with genetic differences who are experts in thinking about the consequences this technology will have for actual human beings, we have grave worries that the use of these ‘genetic scissors’ will, in the future, cut people like us out of existence without others even noticing.”*

## TECHNOLOGY OF GENE-EDITING

**ARTICLE:** [What are genome editing and CRISPR-Cas9?](#)

National Library of Medicine at the National Institutes for Health

*“Genome editing (also called gene editing) is a group of technologies that give scientists the ability to change an organism’s DNA. These technologies allow genetic material to be added, removed, or altered at particular locations in the genome.”*

**ARTICLE:** [The future of gene editing](#)

January 3, 2020 | Columbia University Irving Medical Center

*“In 2012, scientists demonstrated that CRISPR could be reprogrammed to modify the DNA of eukaryotes. Think precision scalpel, gene silencer, gene amplifier, and—like the modern-day Swiss Army knife—an expanding inventory of additional tools.”*

## REGULATION & POLICY

**ARTICLE:** [Why the panic over 'designer babies' is the wrong worry](#)

By Hank Greely | October 30, 2017 | Leaps.org

*“We care much less about mosquito babies than human ones and our legal structures are not built for wise and nuanced regulation of this kind of genome editing. Those issues demand our urgent attention — if we can tear ourselves away from dramatic but less important visions of ‘designer babes.’”*

**ARTICLE:** [Legal reflections on the case of genome-edited babies](#)

By Shuang Liu | May 14, 2020 | Biomed Central

*“We care much less about mosquito babies than human ones and our legal structures are not built for wise and nuanced regulation of this kind of genome editing. Those issues demand our urgent attention — if we can tear ourselves away from dramatic but less important visions of ‘designer babes.’”*

**ARTICLE:** [Commission charts narrow path for editing human embryos](#)

By Jon Cohen | September 3, 2020 | Science

*“The group, which today released one of the most in-depth reports on the topic yet, spells out in great detail genetic situations that [heritable human genome editing] could address and the strict oversight that clinicians in the future must meet before again creating humans with modified DNA that they can pass on to offspring.”*

## THE CRISPR-BABY SCANDAL

**ARTICLE:** [Why are scientists so upset about the first CRISPR babies?](#)

By Gina Kolata & Pam Belluck | December 5, 2018 | The New York Times

## Use Gene Editing to Make Better Babies

*“Although gene editing holds promise to potentially correct dangerous disease-causing mutations and treat some medical conditions, there are many safety and ethical concerns about editing human embryos.”*

**ARTICLE:** [A Reckless and Needless Use of Gene Editing on Human Embryos](#)

By Ed Young | November 26, 2018 | The Atlantic

*“Whether the experiment was successful or not, it’s intensely controversial.”*

**ARTICLE:** [The CRISPR-baby scandal: what's next for human gene-editing](#)

By David Cyranoski | February 26, 2019 | Nature

*“By engineering mutations into human embryos, which were then used to produce babies, He leapt capriciously into an era in which science could rewrite the gene pool of future generations by altering the human germ line. He also flouted established norms for safety and human protections along the way.”*

**ARTICLE:** [What CRISPR-baby prison sentences mean for research](#)

By David Cyranoski | January 3, 2020 | Nature

*“The trio’s prison sentences, combined with the research-funding ban, send a powerful message to other researchers doing any type of gene-editing work in clinical trials in China...”*

## INTERNATIONAL CONSIDERATIONS

**ARTICLE:** [Playing with genes: The good, the bad and the ugly](#)

By Kristinn Helgason, Marcelo LaFleur, and Hamid Rashid | May 2019 | Frontier Technology Quarterly

*“An effective global governance framework is an imperative for ensuring safe and sound application of genetic technologies and making them accessible to all.”*

**ARTICLE:** [China is at the forefront of manipulating DNA to create a new class of superhumans](#)

By G. Owen Schaefer | November 17, 2016 | Quartz

*“It’s reasonable to believe that any seismic shift toward genetic enhancement will not be centered in Western countries like the US or the UK, where many modern technologies are pioneered. Instead, genetic enhancement is more likely to emerge out of China.”*

**ARTICLE:** [China's military biotech frontierL CRISPR, military-civil fusion, and the new revolution in military affairs](#)

By Elsa Kania, Wilson VornDick | October 8, 2019 | The Jamestown Foundation

*“Although CRISPR has numerous exciting, clearly beneficial applications, particularly in medicine and agriculture, other aspects of Chinese research in CRISPR raise ethical or security concerns.”*

## PUBLIC OPINION

**ARTICLE:** [Biotechnology research viewed with caution globally, but most support gene editing for babies to treat disease](#)

By Cary Funk, Alec Tyson, Brian Kennedy, & Courtney Johnson | December 10, 2020 | Pew Research Center

*“Global publics take a cautious stance toward scientific research on gene editing, according to an international survey... Yet most adult publics draw distinctions when it comes to specific applications of human gene editing, including showing wide support for therapeutic uses.”*

**ARTICLE:** [Public views of gene editing for babies depend on how it would be used](#)

By Cary Funk & Meg Hefferon | July 26, 2018 | Pew Research Center

*“A majority of Americans support the idea of using gene editing with the goal of delivering direct health benefits for babies, but at the same time, a majority considers the use of such techniques to boost a baby’s intelligence something that takes technology ‘too far.’”*

**ARTICLE:** [People back editing genes to treat disease, but are wary of inheritable changes](#)

By Courtney Columbus | August 10, 2017 | NPR

*“Another report, published this week by the Pew Research Center, also showed that people are more concerned about germline editing, which changes can be passed down, than they are about gene editing done in somatic cells, which can’t be inherited by future children. Parents of minor children were more concerned.”*

**ARTICLE:** [U.S. public opinion on the future use of gene editing](#)

By Cary Funk, Brian Kennedy, & Elizabeth Podrebarac Sciupac | July 26, 2016 | Pew Research Center

*“While many Americans say they would want to use such a technology for their own children, there is also considerable wariness when it comes to gene editing, especially among parents of minor children.”*