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A Legal Analysis of Human Gene Editing

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ABSTRACT

Technology surrounds us; from waking up in the morning to the end of the day, Technology has wrapped human beings in its massive arms and has inflicted the human race to surrender to its command. Its growth has manifested a world where almost everything is possible. A world that earlier existed merely in the mind of science fiction writers today is possible. Super soldiers and the stories of science fiction have more often than not been a topic of discussion in scientific circles, their viability and possibility have alluded the community, but its actualization through biotechnology is the ultimate win. Gene editing is that ultimate future, the Technology to mutate genes and engineer specific gene outcomes is the roadmap to a fictional future. Its history predicates its use in agriculture, but with new technology, which targets a single specific gene, the doors to an enormous new application have opened up. CRISPR can target specific gene outcomes, and it allows scientists to "cut" and "paste" genes into DNA. Imagine a world where engineering specific gene outcomes to benefit humans in their worldly acts is so close to playing the "god syndrome" that it is dangerous and can yield catastrophic outcomes.

Furthermore, the invention of new technology asks various questions on who uses this technology, on what is it used? Is it monopolized in the hands of a few powerful? What are the legal ramifications and ethical arguments for the use of this technology? Is this the future of our world? Is it possible to use this technology on human beings in armed conflict?

This paper will deal with the legal and regulatory outlook to using this Technology, ethical arguments, and its specific use for humans in armed conflicts, with limited scope of the science behind the technology.

Keywords: *Gene-editing, Biotechnology, Regulatory Framework, Ethical, Armed Conflict*

I. INTRODUCTION

Gene editing or genome editing can make specific changes in the DNA sequence of a living organism, essentially customizing its genetic makeup.[2]. The Technology to alter genes to a

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[2] Judith L. Fridovich-Keil, "Gene editing," (last modified Jun 04, 2019), available from https://www.britannica.com/science/gene-editing.

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specific culmination and use this ability to customize mutated genes is the desired outcome. The regulation of biotechnology and its various intricacies have allowed room for a debate, a debate on who has intellectual rights to this technology, how we regulate it, and the ethical arguments surrounding the use of this technology.

The simple truth is that a syndrome where human beings start 'playing god' is not only dangerous but results in absolute catastrophe. As the speed with which our machines can learn has raised the prospect of the so-called singularity, the moment artificial intelligence has bolted past the human race, we have become a part of a world where we are no longer the masters. We have discovered a tool that bypasses natural selection, giving us direct control over the levers of evolution, ultimately challenging us.

To construe the legal hurdles to use of this Technology involves steps such as intellectual property right, which range from patent policy to international trade laws, which are highly dependent on the flow of this Technology across borders, and acceptance of this tech beyond stigma or cultural differences,

Consumer demand plays a paramount role in the actualization as the need for governments to advertise this technology grows tenfold to accustom the populous to its conditions and development.

The regulatory framework will affect how the technology moves from the labs to development to actual marketed products.

Last of course, but certainly not least, are areas of public research and investment. These together will combine into a vision of how a particular country moves or does not move biotechnology.[3]

(A) Research Methodology

1. Objectives:

The research objectives of this study are as follows:

a) To study gene editing and application to human beings.

b) To overview the regulatory frameworks that exist for biotechnology.

c) To examine the hurdles for manifesting this fictional reality.

d) To answer the viability of use of this technology in today's time

[3] R. Alta Charo, "The Legal and Regulatory Context for Human Gene Editing," VOL. XXXVII, NO. 3, SPRING 2016, available from https://issues.org/the-legal-and-regulatory-context-for-human-gene-editing/.

2. Research Questions:

a) What is the legal outlook towards human gene-editing?

b) What are the relevant provisions and interpretations in international law for regulating biotechnology?

c) Whether there exists any possibility of using new technology in armed conflict? And the legal ownership of the technology?

3. Scope & Limitations:

The Scope of this project is to analyze human gene editing and the international regulatory frameworks, the use of new biotechnology in armed conflicts or soldier research, the ethical and social hurdles of using this technology, India's specific outlook to using this technology. The approach was by examining and analyzing the existing regulatory framework, approach of individual nation-states, and development of technology around the world. The Scope of the topic is limited to the legal outlook of human gene editing and does not maneuver the science behind it in detail.

II. REGULATION OF BIOTECHNOLOGY

Regulation of biotechnology has no internationally agreed-upon laws. Its development and use depend on individual countries' spectrum of least enforceable to most enforceable rules. The range has public consultation on one extreme to legislation on the other end, and legal recourse has also seen two different approaches to regulation from self-regulation by the scientific community in terms of the Asilomar Conference on Recombinant DNA to the Council for International Organisations of Medical Sciences [CIOMS] as an international, non-governmental, non-profit organization established jointly by WHO and UNESCO[4] The organization represents the world's biomedical community through its members, who share the responsibility of ethics and regulation of such Technology through international borders. The spectrum is discussed in brief from least enforceable to most, hereafter: -

- Public consultation- Various examples worldwide cite this method, wherein a consensus persuades the government to decide on technology development.

- For example, The National Environmental Policy Act of the United States follows an unconventional procedure concerning other natural laws in the state.

[4] CIOMS, available from https://cioms.ch/.

- It is opposed to mentioning to people or organizations what they should or should not do, essentially stipulating that when the public authority settles on a specific choice, exposing to a more significant public examination level than standard. [5]The maxim for this methodology is that "daylight is the best disinfectant."

By joining public remark, it makes political weight that can drive choices somehow, and it takes into consideration some transaction between government ability and general discussion. We see other examples of it in the approval process for engineered salmon, which required several public hearings.

When it looked at assisted reproduction, Canada framed a royal commission on new reproductive innovations technology that held hearings on the following theme throughout the nation.

In the European Union (E.U.), genetically engineered foods, or GMOs as they usually are alluded to, are of particular concern. There is an E.U. order requiring that there be a level of free data at whatever point an item possibly influences biodiversity or other ecological components.

The Public council views it as an option in contrast to a suitable mandate type of administration. One makes the circumstance where general society can, through its decentralized cycles, apply tension on government or industry and modify the bearing or the speed of biotechnology advancement.

- Voluntary self-regulation- Next in this hierarchy of enforceability comes voluntary self-regulation. The 1975 Asilomar conference on recombinant DNA technology is one of the significant examples of voluntary self-regulation. The exploration network deliberately forced on itself moratoria on specific applications and executed a progression of preventive measures with containment of potentially hazardous materials.

The Asilomar Conference on Recombinant DNA was an influential conference organized by Paul Berg discussing the potential biohazards and biotechnology regulation held in February 1975 at a conference center Asilomar State Beach.[6].

A group of around 140 professionals (primarily biologists, including lawyers and physicians) participated in the conference to draw up voluntary guidelines to ensure the safety of

[5] R. Alta Charo, “The Legal and Regulatory Context for Human Gene Editing," VOL. XXXVII, NO. 3, SPRING 2016, available from https://issues.org/the-legal-and-regulatory-context-for-human-gene-editing/.
[6] Paul Berg, David Baltimore, Sydney Brenner, Richard O. Roblin III, and Maxine F. Singer. "Summary Statement of the Asilomar Conference on Recombinant DNA Molecules." Proc. Nat. Acad. Sci. Vol. 72, No. 6, pp. 1981-1984, (June 1975): 1981

recombinant DNA technology. The meeting also placed scientific research into the public domain and applied a version of the precautionary principle.[7]

During the conference, The panel established the principles guiding the recommendations for conducting experiments using this Technology safely. The first principle for dealing with potential risks was that the investigations should make containment an essential consideration in the experimental design. A second principle was that the effectiveness of the containment should match the estimated risk as closely as possible.[8].

A long time after the conference, individuals credited much criticalness to it. Paul Berg and Maxine F. Vocalist in 1995, the forum denoted the start of an exceptional time for both science and the public discussion of science strategy. The rules conceived by the conference empowered researchers to conduct explores different avenues regarding recombinant DNA technology, which by 1995 ruled natural exploration. This exploration, thus, expanded information about principal life measures, for example, the cell cycle.

Additionally, the conference and public discussions on recombinant DNA expanded public interest in biomedical exploration and atomic hereditary qualities. Therefore, by 1995, hereditary qualities and their jargon had become a piece of the day-by-day press and television news. Another colossal result of the conference was the point of reference it set about responding to changes in logical information. As indicated by the meeting, the correct response to new analytical information was to create rules that administered how to direct it.[9]

This conference played a significant role in denoting responsibility on the scientific community of all the risks involved in using Technology on human beings, which opened dialogue on the ethical hurdles for using this Technology and set up the future of this world. It was a success in many ways that it forestalled what might have been arduous government action at the state or federal levels. It demonstrated that self-regulation could be flexible and nuanced without sacrificing reliability. 'gain and function research' also used the self-regulatory approach, which is the euphemism for biological research to increase the virulence and lethality of pathogens and viruses.[10] Interestingly, these kinds of voluntary self-regulatory activities often lead directly into some government adoption by proxy of much of

[7] Binary, a summary of the Asilomar conference on recombinant DNA, available at https://www.bionity.com/en/encyclopedia/Asilomar_Conference_on_Recombinant_DNA.html.
[8] Paul Berg, David Baltimore, Sydney Brenner, Richard O. Roblin III, and Maxine F. Singer. "Summary Statement of the Asilomar Conference on Recombinant DNA Molecules." Proc. Nat. Acad. Sci. Vol. 72, No. 6, pp. 1981-1984, (June 1975)
[9] Berg, P. and Singer, M., 1995. The Recombinant DNA Controversy: Twenty Years Later. Bio/Technology, 13(10), p.9012.
[10] Alliance for human research protection, “What is Gain-of-Function Research & Who is at High Risk?”, May 19, 2020, available from https://ahrp.org/what-is-gain-of-function-research-who-is-at-high-risk/.

the content of the self-imposed rules. For example, in the gain of function area, some of the self-imposed regulations led to a National Academies report, which then led, in turn, to the creation of the National Scientific Advisory Board for Biosecurity.

- Council for International Organizations of Medical Sciences - At the international level, the Council for International Organizations of Medical Sciences (CIOMS) is extremely powerful in making worldwide principles for research on human subjects. It refers explicitly to the Nuremberg protocols and can be more prohibitive than a specific national set of rules.

Which does not mean that national laws will necessarily follow, but it establishes a norm from which nations feel free to deviate only when they can justify that it is necessary to achieve some public benefit. Therefore, the CIOMS becomes exceptionally influential, even if not enforceable.[11]

- Legislation: At the far end of the spectrum, there is regulation and legislation; each nation-state has its particular laws. It makes sets the ideal situation for the research and development of such tech and its use.

For reference, currently, no internationally agreed-upon legislation exists for the use of CRISPR, and each nation can individually act on its development, where states have principal issues with the help of this tech, where nations such as Canada, the USA, and the U.K. completely prohibit modifying the germline, countries such as France and Argentina are not regulated so strictly,

Indian protocols, on the other hand. [12]prohibit human germline editing and reproductive cloning, as detailed in the National Guidelines for Stem Cell Research by the Indian Council of Medical Research. However, the concern is that these guidelines have not yet been converted into specific laws[13].

The effect of the legislation is that it makes the development and use of Technology more credible; it allows room for political correctness, which empowers a nation-state to do more research and regulate it to its benefit and political philosophy. However, on the flip side, when legislation is in place, there is hardly ever room for a grey area to exist. It sets the rules to be followed in the mortar and finalizes the process entirely, leading to less development

[11] R. Alta Charo, "The Legal and Regulatory Context for Human Gene Editing," VOL. XXXVII, NO. 3, SPRING 2016, available from https://issues.org/the-legal-and-regulatory-context-for-human-gene-editing/.
[12] Jayaraman KS. India bans commercial use of stem cells for therapy. Nature India. 2017 Oct 15 [cited Mar 31]. Available from:www.natureasia.com/en/nindia/article/10.1038/nindia.2017.130
[13] Indian Council of Medical Research. National Ethical Guidelines for Biomedical Research Involving, Human Participants. New Delhi: ICMR; 2017 Oct[cited 2019 Mar 29]. Available from: http://icmr.nic.in/sites/default/files/guidelines/ICMR_Ethical_Guidelines_2017.pdf.

and corrupt political practices.

III. WORLD'S OUTLOOK TOWARDS THIS TECHNOLOGY

To direct the use of Technology in a particular field, the government regulating such Technology has to create clear, unambiguous guidelines and execute control and development by itself. However, the ideology of a nation-state is critical. Do they perceive biotechnology as an end or a means to an end? Which makes all the difference

- There is a crucial separation in the world about managing biotechnology that goes past promotional, permissive, or prohibitive classifications. We consider biotechnology a thing unto itself or believe it basically as one more instrument that makes different items.

- If one directs the innovation, one ultimately manages everything about the invention. A model is the EU's, where people group procedure, which adopts a worldwide strategy to the innovation that makes it simpler for the general population to comprehend the purported "laws on biotechnology." One can zero in on critical parts of the science that make fundamental inquiries regarding the impacts of a specific development. It makes it conceivable to have steady and general ways to deal with investigations of extraordinary philosophical noteworthiness, for example, what we mean when we state "human pride" or "hereditary legacy of humankind."

- Like the case in the United States, It also requires more explicit enactment to zero in on individual items. As is noted in a differentiating framework where you control the thing and not the innovation, the innovation itself is neither characteristically perilous nor safe. It is hazardous in certain unique situations and protected in others. In certain items, it is simpler to anticipate their belongings. In different things, it is significantly less likely. A few items may have ecological effects, and for other people, a solitary individual or a solitary creature limits the outcome.

- Directing side-effect gives one the upside of being considerably more explicit about the level of danger that is dreaded or foreseen. The level of alert required, just as having the option to exploit skill levels in the administrative pathways suitable for medications, nourishments, pesticides, and the master individuals who have been actualizing those pathways for quite a long time.

- The difficulty is that it very well may be befuddling to the general population. If somebody asks: what is the "law on biotechnology," the available answer is that there are 19 different laws that cover drugs, gadgets, rural items, animals, and more such paradigms. To

numerous individuals, this seems as though the nation is not managing biotechnology, and it makes the opportunities for unintended or even unnoticed holes among these laws or clashes among them.

- When a climber plant is growing, it is vital to give it external support to grow vertically and be strong, similarly with Technology and its development.

- Nevertheless, the external support also needs to analyze whether or not the sapling is healthy and will yield a vigorous plant or it is going to die soon.

- After discussing biotechnology regulation and how we can intertwine Technology with the politico-legal sphere of a nation, it is essential to confer it from an ethical POV.

- What are the problems that stand in its way other than the scientific discovery, for example- social issues, cultural issues, economic issues, which are all singular to each nation-state? I will discuss this in detail with India's reference, and in conclusion, can this Technology be restricted to use in only one particular direction.

IV. ETHICAL PROBLEMS- INDIA

Technology and its growth have manifested much quicker than India's ability to reach a moral consensus on its use and development; this has created a legal vacuum. The lack of legislation and scope for unfair and corrupt practices has overtaken the field. Based on the management of scientific Technology in the past, it is uncertain whether or not the current regulatory landscape in India would enforce the regulation of such a compelling technology safely and ethically.

- Past developments in genetic Technology have been mishandled, demonstrating India's regulatory organizations' capacity (or lack thereof). For example, take the action of genetically modified crops. For instance, as the ongoing debate in parliament on the regulations' permissibility was underway, they were illegally and prematurely sown in Gujarat in spades because of their perceived profitability.[14].

- Such illegal acts are largely a result of corrupt practices in Indian regulatory agencies. In the medical field, India has even gone so far as to ban the clinical use of stem cell therapy because of "rampant malpractice" and the inability to regulate its commercial use[15]. Corruption within such organizations is so rampant that India's medical administration is said

[14] Padma T.V. It is time India has a conversation about the ethics of gene editing. Hindustan Times. 2017 Dec 18[cited 2019 Apr 2]. Available from: https://www.hindustantimes.com/opinion/it-s-time-india-has-a-conversation-about-ethics-of-gene-editing/story-ihB3o3DbZEvLeXVGdcYZYN.html

[15] Jayaraman KS. India bans commercial use of stem cells for therapy. Nature India. 2017 Oct 15 [cited Mar 31]. Available from:www.natureasia.com/en/nindia/article/10.1038/nindia.2017.130

to be one of the most corrupt in the world, with physicians, medical regulatory bodies, and even the government playing a part[16]

- The Medical Council of India (MCI) and the Indian Medical Association (IMA) have confronted various scandals concerning bribes for the foundation of establishments and even whole institutions. Endeavors to consider them responsible through the available sets of laws have been invalid and void in light of the accumulation of cases. Only a tiny fraction of prosecutions have brought about legal consequences. [17]Therefore, there is little demoralization of the abuse and manipulation of clinical Technology for personal or business gain.

- The overall development of illicit businesses for human organs and fake medication in India is the best demonstration of this assertion. India's black market for organs is one of the biggest on the planet. Emergency clinic chairpersons, specialists, and even law implementation authorities routinely got for the acquirement and offer of black-market organs. This state portrays regulation for clinical administrations in India and raises a few concerns while considering profitable gene-editing technology regulation.[18]

- Translating these discussions into public discourse is urgent, as advances in quality altering technology have just started to gather force. Privately owned businesses have just tried to investigate the business capability of such Technology in India, and they will doubtlessly walk forward in due time.

- On a surer note, Indian researchers have been making exceptional headways in examination utilizing quality altering technology, which includes controlling substantial cell tests from patients with blood issues like sickle-cell anemia. [19]The vital question is whether examination will continue in a protected and moral way. The situation appears to be dicey without lawfully enforceable rules and a successful administrative and legitimate foundation.

- The potential for abuse in an Indian context is driven by various sociocultural components characteristic of the subcontinent. For instance, take the general natural inclination for light complexion in Indian culture. The inescapability of widespread concern

[16] Mahajan V. White coated corruption. Indian J Med Ethics. 2010 Jan-Mar; 7(1):18-20. Available from: https://ijme.in/articles/white-coated-corruption/?galley=html.
[17] Mahajan V. White coated corruption. Indian J Med Ethics. 2010 Jan-Mar; 7(1):18-20. Available from: https://ijme.in/articles/white-coated-corruption/?galley=html
[18] Ahuja SK. It is not the first time for Dr. Amit. Hindustantimes.com. 2008 Feb 5 [cited 2019 Mar31]. Available from: https://www.hindustantimes.com/india/not-first-time-for-dr-amit/story-ya0pe7IX1hq0g9nIY3riSI.html
[19] Priyadarshini S. Armed with CRISPR scissors, Indian scientists look at curing the incurable. Nature India. 2018 Aug 7[cited 2019 Mar 31]. Available from: https://www.natureasia.com/en/nindia/article/10.1038/nindia.2018.100

over a fairer skin tone in consumer markets, with the Indian population having spent over $500 million on "fairness" products in 2014[20].

- This sociocultural obsession converts into discrimination against darker skin tones in the professional circle. In 2012, nearly 70% of the reviewed population favored partners of a more attractive complexion. Numerous businesses, including film, hospitality, and aviation ventures, are damaged by instances of dynamic discrimination against candidates with more obscure faces. [21]How much will these inclinations take structure in medical care markets if consumers can control such qualities? The interest in these characteristics certainly exists, and it would not be unreasonable to be concerned over the expected future abuse of advances like CRISPR to satisfy such a need.

- Maybe the sociocultural component that justifies the consideration of the merits is one that the Indian clinical profession has been wrestling with for quite a long time. The inclination for a male child is behind probably the most severe moral crimes in the clinical career. Indeed, genuinely ongoing innovative advances have been appeared to engage such inclinations, contributing to the inconceivably slanted sex ratios observed in numerous Indian states.[22].

- The typical sex proportion noticed for children is 952 girls for every 1000 boys. However, in states like Haryana, it stays as low as 830:1000, and conditions like Punjab, Delhi, Bihar, Gujarat, Andhra Pradesh, and Madhya Pradesh all miss the mark regarding the ordinary. [23]As per general wellbeing researchers, the expanded accessibility of ultrasound machines in country zones combined with poor to no regulation of sex determination laws is one of the driving variables behind these slanted proportions.[24].

- This patriarchal outlook is a troubling pattern that outcomes in antagonistic impacts to the Indian population. From an economic viewpoint, as per a report by McKinsey and Co, India's GDP could be 60% higher in 2025 if ladies assumed a similar part in the labor force as

[20] Ahuja A. Fair chance: How Indian voters use skin color to choose candidates. Huffington Post India. 2017 Jul 28[cited 2019 Mar 30]. Available from: https://www.huffingtonpost.in/amit-ahuja/fair-chance-how-indian-voters-use-skin-color-to-choose-candidat_a_23053514/

[21] Dasgupta P. Discrimination based on skin color at the workplace. SHEROES. 2016 Dec 29 [cited 2019 Feb 1]. Available from:https://sheroes.com/articles

[22] Mackenzie D. Technology driving rise in abortions of girls in India. New Scientist. 2015 Feb 4 [cited 2019 Mar 31]. Available from:https://www.newscientist.com/article/mg22530074-400-technology-driving-rise-in-abortions-of-girls-in-india/

[23] Seven brothers. Economist. 2011 Apr 9 [cited 2019 Mar 31]. Available from:https://www.economist.com/asia/2011/04/07/seven-brothers.

[24] Tripathi A. Sex determination in India: Doctors tell their side of the story." Scroll.in, 2016 Apr 13[cited 2019 Mar 30]. Available from: https://scroll.in/article/805064/sex-determination-in-india-doctors-tell-their-side-of-the-story.

men. [25]While there is no uncertainty that other components (sexism in the labor force, fundamental male-centric society, and similar patriarchal conventions) likewise contribute to an inconsistent labor force, slanted sex proportions are not an irrelevant driving variable.

- From a social stance, detailed investigations have additionally connected slanted sex proportions to the expansion in rough sexual violations, explicitly illegal exploitation, and sexual maltreatment. Therefore, we see that we have a reasonable and economic basis to protect these proportions and forestall unlawful sex selection.

- The latest things anticipate the potential for future abuse and misapplication and how abuse on clinical Technology in the past can fill in as significant lessons. On the off chance that abuse on history and existing clinical advancements have due to these driving sociocultural variables, it gives us reason to accept that this could be the situation with quality-altering technology. Therefore, the moral and robust regulation of CRISPR technology must contemplate these components.

V. FUTURISTIC APPROACH TO USE OF THIS TECHNOLOGY

The incredible discoveries that are a part of fiction, or where a layman's thought cannot reach, are today a near reality. This scientific approach has broken all ethical, social constructs and created a realm where one is forced to look in awe and contemplate where our world has reached.

Have we humans advanced so much that we are capable of playing god? Taking into foresight the approach by The Défense Advanced Research Projects Agency (DARPA), an ambitious U.S. government project, which develops cutting-edge Technology for the military.

It is funding a team of researchers to develop a temporary, reversible radiation countermeasure that uses the gene-editing tool CRISPR to use in the defense. Akin to a vaccine, scientists are trying to produce a genetic medicine that can ramp up the body's natural defenses before and after a person is exposed to radiation.

Read that again, and read it with conviction that in today's world, we have advanced to a position where we can think and fund a project that can temporarily alter or genetically engineer a soldier's body to be averse from radiation make them not human.

The researchers plan to use a modified form of CRISPR that can turn genes on and off without changing the DNA code itself. These fluctuations are known as gene expression,

[25] Iwamoto K. Asia's gender imbalance Is bad news for growth. Nikkei Asian Review. 2017 Apr 13 [cited 2019 Mar 32]. Available from: https://asia.nikkei.com/Economy/Asia-s-gender-imbalance-is-bad-news-for-growth.

where no permanent modification of the DNA has occurred. However, does this end at fluctuations, or is there more to it? Now, this seems too good to be true, so what are the pitfalls? What are the problems associated with the use of this tech?

- Firstly, to use this Technology on soldiers requires a foolproof process, which is universal to all and safe to administer, and sound, obedient men are not used as guinea pigs.
- Secondly, the funding process needs to be transparent and free from corrupt practices and political agendas, not forcing one wing's ideology on the other.
- Thirdly, an armed conflict to take place and an arena where people are exposed to radiation,
- All these conditions need to pre-exist for this Technology to bear any fruit. What a sad world to be a part of, were scientists, lawyers, and futuristic people are hoping for a disaster to take place, to test the perimeter of their Technology.
- Also, a significant point is the consent to use this Technology; soldiers are intertwined to be obedient. Their programming is that they do not have an option to disobey orders, so how do we teach free consent to administer such technology? Free consent is a question which loops many people.
- To also point out that the discovery of technologies is for a good cause, the intention is "not to harm." Still, does this principle apply universally, or can this Technology not be used for all the wrong reasons and move into the hands of dictators and yield mass disaster in the world.
- It is important to note that the United Nations treaties control the use of nuclear bombs, the Non-Proliferation treaties. Still, the actual result of countries dumping their ammunition is not prevalent. So, how do we assume that in the world that we are a part of, where extremist opinions swing world leaders, we are not inviting our death?
- The pros are shiny, but the general population can understand *that we are not ready for such a technology when the world seeks reality.*

VI. APPLYING THIS TECHNOLOGY IN TODAY'S WORLD

It is important to note that this research is a preliminary understanding of whether or not we can use this technology in today's paradigm in a directed version. Nevertheless, with the time

we live in, especially after the breakout of the Covid-19 virus, it is pertinent to note that even to question new Technology to alter genes is vociferous during the pandemic.

The science community now must use CRISPR to develop a solution that does not target the Covid-19 strain. To contemplate the allocation of funds by the Indian science community is uncalled for; during this pandemic, the sole focus is the Covid- 19 virus, and it is after effects. Moreover, maybe this is the reason why the research has stalled to this great extent. Not only has the pandemic destroyed our economy, but it has also shackled the great R&D process of scientific discovery.

VII. CONCLUSION

In conclusion, we can state that gene editing is a fictional reality where we cannot attain results. Its understanding has improved with time, but there is a restriction in application to many regulation circles. Its legal analysis states that the spectrum of regulation that pre-exists is not only as effective but for such a drastic change in biotechnology, insufficient and practically setting new standards for a new legal framework to be curated.

The simplistic understanding that every nation-state has succumbed to its individualistic ideology for creating legal frameworks to regulate biotechnology; is this spectrum with no curated international laws or initiative for this biotechnology field.

Also, the grave ethical problems before the application of this Technology have overtaken the entire process and shunned the discovery in a bad light. When we localize this technology to India, we conclude that both management and reasoning behind the management of said technology are challenging to achieve but ransacked with many ethical problems.

In conclusion, the entire purpose of researching the legal point of view of human gene editing was to curate a solution: whether or not in today's time, we can use this technology on humans and actively edit or engineer their DNA.

After my research, I can safely conclude that such a process is impossible in today's time due to various reasons all enumerated through my research.

The lack of regulation measures, the use of this technology as an end instead of a means to an end, the ethical problems attached to its undirected use, lack of procedure in directed service, and finally, the pandemic disallowing research and development of said Technology all direct the impossibility of this task.

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VIII. BIBLIOGRAPHY

1. https://geneticeducation.co.in/what-is-genetic-engineering-definition-types-process-and-application/
2. https://www.britannica.com/science/gene-editing
3. https://guides.libraries.uc.edu/c.php?g=222758&p=1473415#:~:text=The%2020th%20Edition%20of%20The%20Bluebook%20Rule%2018.2.1,brackets%E2%80%9D%20%E2%80%93%20the%20rule%20includes%20the%20following%20example%3A
4. https://ijme.in/articles/starting-the-conversation-crisprs-role-in-india/?galley=print
5. routledge.com/Gene-Editing-Law-and-the-Environment-Life-Beyond-the-Human/Braverman/p/book/9780367138462
6. https://issues.org/the-legal-and-regulatory-context-for-human-gene-editing/
7. https://issues.org/why-we-need-a-summit-on-human-gene-editing/
8. https://www.bionity.com/en/encyclopedia/Asilomar_Conference_on_Recombinant_DNA.html
9. https://cioms.ch/
10. https://ahrp.org/what-is-gain-of-function-research-who-is-at-high-risk/
11. https://onezero.medium.com/the-government-aims-to-use-crispr-to-make-soldiers-radiation-proof-3e18b00c9553

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