The Academic
International Journal of Multidisciplinary Research

An Online Peer Reviewed / Refereed Journal
Volume 3 | Issue 7 | July 2025
ISSN: 2583-973X (Online)
Website: www.theacademic.in

DNA, Dignity and Due Process: Constitutional Reflections on the Ethics of Genetic Engineering

Mr. Priyank Rawat

DOI : https://doi.org/10.5281/zenodo.16782211

ARTICLE DETAILS

Research Paper

Accepted: 16-07-2025

Published: 10-08-2025

Keywords:

Genetic engineering, biotechnology, dignity, due process

ABSTRACT

This article examines the ethical and constitutional implications of genetic engineering within the Indian legal framework. With the emergence of powerful tools like CRISPR-Cas9, the potential to modify human DNA raises serious concerns about individual dignity, bodily autonomy, privacy, and equality. Grounded in constitutional values enshrined in Articles 14, 19, and 21, the paper critically examines how unregulated gene-editing, particularly germline interventions, may violate due process and lead to genetic discrimination. It draws upon key Supreme Court decisions such as *Puttaswamy*, *Suchita Srivastava*, and *Navtej Johar* to advocate for a rights-based legal approach to biotechnology. The article recommends comprehensive legislative and institutional reforms, including the recognition of genetic data as sensitive information and the establishment of a National Bioethics Commission. Ultimately, it argues that while genetic science may alter DNA, only constitutional morality can safeguard human dignity in the genomic age

INTRODUCTION

The twenty-first century marks a transformative phase in human history, wherein biotechnology, particularly genetic engineering, has altered the boundaries of what is scientifically and ethically permissible. With tools like CRISPR-Cas9, scientists are now able to directly modify genes, correct genetic disorders, and even alter inheritable traits in embryos. These possibilities raise pressing

constitutional concerns, particularly in countries like India, where dignity, liberty, and equality form the bedrock of constitutional morality.

While scientific advancement is essential for societal progress, it must operate within a framework that respects fundamental human rights. The Indian Constitution, through Articles 14, 19, and 21, provides a dynamic legal framework that has evolved through judicial interpretation to include the right to privacy, bodily integrity, reproductive autonomy, and informational self-determination. As genetic engineering begins to influence life itself at the molecular level, it is vital to evaluate whether it aligns with constitutional values or undermines them.

This article explores the ethical and constitutional implications of genetic engineering in India. It focuses on three critical aspects: the right to human dignity, the requirement of due process in genetic interventions, and the potential impact on equality and genetic privacy.

2. GENETIC ENGINEERING AND ITS ETHICAL TRAJECTORY

Genetic engineering refers to the direct manipulation of DNA to alter the characteristics of an organism. From agricultural modification to human gene therapy, the applications are diverse. The most revolutionary among them is CRISPR-Cas9, a gene-editing tool that allows targeted modifications at precise locations in the genome. It has enabled scientists to correct mutations that cause diseases like sickle cell anaemia, cystic fibrosis, and certain types of cancer.

However, not all applications are therapeutic. The same tools can be used for germline editing, where changes made to an embryo's genome can be passed down to future generations. This raises complex ethical questions, especially regarding consent, autonomy, and intergenerational justice. Germline editing affects individuals who have no opportunity to consent to genetic changes made before their birth.

The 2018 case of Chinese scientist He Jiankui, who edited the genomes of twin girls to make them resistant to HIV, received global backlash for violating international ethical norms and informed consent protocols. It spurred the World Health Organization and UNESCO to demand global regulatory frameworks to prevent the misuse of gene-editing technologies.

3. HUMAN DIGNITY AND THE INDIAN CONSTITUTIONAL FRAMEWORK

In Indian constitutional jurisprudence, human dignity is a core value enshrined under Article 21, which guarantees the right to life and personal liberty. In *Francis Coralie Mullin v. Administrator, Union*

Territory of Delhi, The Supreme Court stated that the right to life includes the right to live with human dignity and all that goes along with it.

Later, in the landmark privacy judgment, *Justice K.S. Puttaswamy v. Union of India* The Court held that dignity lies at the heart of all fundamental rights, including privacy, autonomy, and bodily integrity. This includes the right of an individual to control their personal and biological information, including genetic data. Genetic engineering, especially when done without the knowledge or consent of the subject (as in germline editing), may infringe upon these rights and reduce individuals to objects of technological design.

This concern echoes the Kantian moral philosophy, which holds that every person should be treated as an end in themselves, not merely as a means to an end. If a child's genetic traits are selected or altered to suit parental preferences or market demands, the child may be deprived of the right to an open future.

4. CONSTITUTIONAL MORALITY AND SCIENTIFIC PROGRESS

The concept of constitutional morality was elaborated by the Supreme Court in *Navtej Singh Johar v. Union of India.*, where it held that State actions must conform to constitutional values, not societal prejudices or moral anxieties. Scientific innovation, therefore, cannot justify actions that violate dignity, liberty, or equality.

Genetic engineering must operate within the constitutional ethos of India. Any intervention in the genetic structure of individuals, particularly those affecting future generations, requires a legal framework that ensures informed consent, ethical oversight, and judicial review. The current absence of such a framework in India creates a regulatory vacuum, exposing individuals to possible violations of their fundamental rights.

5. DUE PROCESS AND THE CONSTITUTIONAL SAFEGUARDS AGAINST ARBITRARY GENETIC INTERVENTIONS

The Indian Constitution, under Article 21, not only guarantees the right to life and liberty but also mandates that no person shall be deprived of these rights except according to a procedure established by law. In *Maneka Gandhi v. Union of India*, the Supreme Court expanded the interpretation of this phrase to mean a procedure that is fair, just, and reasonable. Any interference with bodily autonomy or personal liberty, including genetic intervention, must therefore comply with this threshold.

Genetic engineering, especially when applied to humans, must not occur in an unregulated or arbitrary fashion. For example, gene-editing experiments conducted on embryos or adults without full regulatory oversight and informed consent would violate the principle of due process. Moreover, these interventions may have intergenerational effects, impacting not just the individual subject but future offspring, thus expanding the scope of constitutional scrutiny.

Currently, India does not have a comprehensive legal framework that regulates human genome editing. The Draft DNA Technology (Use and Application) Regulation Bill, 2019, which primarily focuses on forensic DNA profiling, fails to address the ethical and constitutional concerns surrounding therapeutic or enhancement-based genetic editing. The absence of dedicated legislation renders such technologies vulnerable to misuse and abuse, potentially infringing upon bodily integrity and reproductive rights.

In contrast, countries such as Germany, where human dignity is constitutionally protected under Article 1 of the Basic Law, strictly prohibit germline editing and cloning, recognizing the inherent risk of reviving eugenic ideologies. India, too, must proactively legislate to ensure that scientific advancement is tempered by constitutional values.

6. THE RIGHT TO PRIVACY AND GENETIC INFORMATION

Genetic engineering is intimately linked to genetic data, and genetic data is among the most sensitive and personal forms of information a person can possess. It contains details not only about the individual's identity, ancestry, and predispositions but also information about family members. Consequently, any unregulated access to or use of genetic data can lead to serious violations of informational privacy.

In the *Justice K.S. Puttaswamy v. Union of India* (2017) decision, the Supreme Court held that privacy is a fundamental right under Article 21 and that informational privacy must be given the highest level of protection, especially in the context of emerging technologies. The Court noted that bodily and mental autonomy are inextricably linked to the dignity of the individual, and this would include genetic autonomy as well.

Yet, in India, no law specifically governs the collection, storage, or use of genomic or biometric data for therapeutic or commercial purposes. The Digital Personal Data Protection Act, 2023, while a significant step toward data privacy, does not contain provisions explicitly regulating genetic data as a special category. In contrast, under the EU General Data Protection Regulation (GDPR), genetic data is

categorized as sensitive personal data, and its processing is allowed only under strict safeguards, including the necessity of explicit informed consent.

In a future where gene-editing may become common, individuals' genetic information may be used by employers, insurance companies, or even educational institutions to determine potential liabilities or talents. Without a legal barrier, this could lead to genetic discrimination, which fundamentally undermines the constitutional principle of equality.

7. AUTONOMY, CONSENT, AND REPRODUCTIVE RIGHTS

The right to make decisions about one's body has been repeatedly upheld by Indian courts as part of the right to personal liberty and dignity. In *Suchita Srivastava v. Chandigarh Administration* The Supreme Court affirmed that reproductive decisions lie at the heart of bodily autonomy and privacy. If this principle is extended logically, decisions regarding gene therapy or embryo editing also fall within the ambit of this right.

However, in the case of germline editing, the subjects' future children cannot consent to the alterations being made to their DNA. This raises profound ethical and legal concerns: Is it constitutionally permissible for parents or the State to decide the genetic future of a person who does not yet exist and cannot participate in the decision-making process?

Further, if gene-editing technologies are accessed disproportionately by wealthy or urban populations, they may become tools of socio-genetic stratification, enabling a new form of privilege rooted in biology. Such a development would directly conflict with the constitutional commitment to equality and social justice under Articles 14, 15, and 38.

8. JUDICIAL OVERSIGHT AND NEED FOR LEGISLATIVE CLARITY

In the absence of clear laws, the judiciary will inevitably be called upon to determine the constitutional permissibility of various forms of genetic intervention. However, courts are not ideally suited to create comprehensive regulatory policies for complex biotechnological questions. What is required is a robust legislative framework, informed by bioethics, constitutional law, and public health principles.

A potential model could be drawn from the UK Human Fertilisation and Embryology Authority (HFEA), a statutory body that regulates assisted reproductive technology and embryo research under strict ethical guidelines. India could similarly establish a National Bioethics and Genomic Integrity Commission,

tasked with reviewing applications for human genome editing, ensuring compliance with constitutional standards, and overseeing public education on bioethical issues.

The principles of accountability, transparency, and participatory law-making must govern the regulation of genetic engineering. Until such legislation is enacted, the precautionary principle as enshrined in Indian environmental jurisprudence should guide policy decisions, erring on the side of protecting fundamental rights over scientific enthusiasm.

9. GENETIC DISCRIMINATION AND THE RIGHT TO EQUALITY

Genetic engineering has the potential not only to cure disease but also to create new forms of inequality. As gene-editing technologies advance, access to these innovations is likely to be stratified by class, caste, geography, and education. Without adequate safeguards, we risk entering a world where genetic "enhancement" becomes available only to the wealthy and elite, thereby creating a biologically privileged class.

Under Article 14 of the Indian Constitution, the State is required to ensure equality before the law and equal protection under law. Similarly, Article 15 prohibits discrimination on grounds including race, caste, sex, or place of birth. However, genetic discrimination using a person's DNA to exclude them from opportunities in employment, insurance, or education may soon emerge as a new axis of exclusion.

Although India has yet to experience formal cases of genetic discrimination, global experiences provide a cautionary tale. In the United States, despite the Genetic Information Nondiscrimination Act (GINA), 2008, complaints have been raised about employers seeking access to genetic test results to screen employees for potential future medical costs. Without similar safeguards in India, such practices could violate not only individual dignity but also constitutional equality.

Moreover, given India's already existing socio-economic disparities, unregulated genetic enhancement could deepen divisions. Imagine a future where genetically modified children are deemed more intelligent, disease-resistant, or socially desirable. In such a context, existing structures of privilege, caste, class, and gender may align with genomic privilege, resulting in intersecting forms of disadvantage for already marginalized communities.

As observed in *State of West Bengal v. Anwar Ali Sarkar*, equality is not merely formal but substantive, requiring laws to prevent unfair classifications. A just legal order must preclude technologies that produce irreversible inequalities among future generations.

10. ACCESSIBILITY, JUSTICE, AND PUBLIC HEALTH

The ethical concern is not limited to discrimination alone; it extends to the right to access beneficial technologies. If genome therapy becomes the future of medicine, its availability must be treated as a component of the right to health, an aspect already recognized under Article 21 by Indian courts. The right to health includes not just access to treatment, but also affordability, availability, and non-discriminatory distribution.

International conventions like the International Covenant on Economic, Social and Cultural Rights (ICESCR) impose obligations on States to ensure the "highest attainable standard of physical and mental health". Article 12 of the ICESCR explicitly requires measures to prevent, treat, and control epidemics and hereditary diseases, an area where genome therapy may become pivotal. India, being a signatory, has a positive obligation to make these services universally accessible.

Thus, legal regulation must ensure that genomic advancements do not become exclusive commodities for the elite but are integrated into public health infrastructure for equitable access. Without this, genetic engineering would violate not only Articles 14 and 21 but also India's international human rights obligations.

11. POLICY RECOMMENDATIONS: TOWARDS A CONSTITUTIONAL BIOETHICS

To avoid the dystopian consequences of unchecked genetic engineering, India must adopt a rights-based legal framework rooted in constitutional ethics. The following recommendations aim to guide the development of such a regime:

a) Enact a Human Genome Ethics and Regulation Act

India needs a comprehensive legislation that regulates all aspects of human genetic engineering from research and development to clinical application and public use. This law should:

- Ban non-therapeutic germline editing and cloning.
- Mandate licensing and approval for any genetic intervention.

- Establish ethical guidelines and review boards across institutions.
- Define criminal and civil penalties for violations.

Such legislation must be grounded in Articles 14, 19, and 21, ensuring that all applications are non-discriminatory, consensual, and rights-based.

b) Establish a National Commission on Bioethics and Genomic Justice

Like the UK's Human Fertilisation and Embryology Authority, India should create an autonomous body that functions as:

- A regulatory authority for gene-editing research and therapy.
- An ethical review board for experimental approvals.
- A public engagement platform for transparent discourse.

This body must include experts in law, medicine, ethics, public health, sociology, and technology, ensuring a pluralist constitutional approach to genetic ethics.

c) Recognize Genetic Data as Sensitive Personal Information

The Digital Personal Data Protection Act, 2023, should be amended to expressly recognize genetic information as a separate category of sensitive personal data, subject to heightened safeguards such as:

- Mandatory consent for collection and sharing.
- Restrictions on access by employers, insurers, and third parties.
- Rights to withdraw consent and demand data erasure.

This would fulfil the obligations laid out in *Justice K.S. Puttaswamy v. Union of India*, ensuring the right to informational privacy in its deepest biological form.

d) Ban Genetic Discrimination in Employment and Insurance

India should proactively draft an anti-discrimination statute, inspired by the U.S. **GINA**, which:

- Prohibits genetic testing as a condition for employment or insurance.
- Bans premium variation based on predicted diseases.
- Provides remedies for victims of genetic bias.

This aligns with the equality code of Articles 14, 15, and 16, ensuring that biology is not used to reproduce or justify social inequalities.

e) Promote Public Awareness and Ethical Literacy

Finally, no law can succeed without an informed public. The State must engage in:

- Curriculum reforms to introduce bioethics in law and science education.
- Public consultations on proposed laws and policies.
- Accessible forums where citizens can express bioethical concerns.

As held in *A.K. Gopalan v. State of Madras*, liberty must be protected not only from executive arbitrariness but also from uninformed choices that undermine dignity. Citizens must be aware of their genomic rights to meaningfully exercise them.

12. CONCLUSION: GUARDING THE GENOME THROUGH THE CONSTITUTION

The emerging frontier of genetic engineering compels constitutional democracies to re-examine the meaning of rights, liberty, and justice in an era when the very blueprint of life can be edited, altered, and redesigned. In India, where constitutional jurisprudence has continually evolved to include technological and bioethical concerns, the regulation of genetic engineering must be guided not just by scientific utility but by constitutional morality.

The promise of genetic science is undeniable. It offers solutions to incurable diseases, revolutionizes medicine, and could potentially enhance the quality of life for future generations. But history warns us that when science operates without ethical checks, it can lead to dystopian realities, from coercive sterilizations to genocidal eugenics. Thus, any engagement with genetic engineering must be anchored in human dignity, a non-negotiable constitutional value.

The Constitution of India, particularly through Articles 14, 19, and 21, offers a rich framework to address the ethical complexities of biotechnology. Article 21's protection of life and personal liberty, interpreted

to include bodily integrity, reproductive freedom, privacy, and dignity, directly applies to the realm of genome editing. Similarly, Articles 14 and 15, which mandate equality and non-discrimination, can serve as constitutional shields against the rise of genetic classism or genomic elitism.

Yet, the existing legal infrastructure in India is woefully inadequate to meet these challenges. The Draft DNA Technology Bill is narrowly focused, and broader regulations regarding germline editing, consent, and gene data privacy remain absent. In the absence of statutory safeguards, individuals are vulnerable to both private exploitation and State overreach, leading to potential violations of fundamental rights.

Comparative legal analysis reveals that other democracies have responded more decisively. For instance, Germany's Basic Law prohibits germline editing entirely., while the United Kingdom has established a statutory regulatory authority to oversee embryo research. India, despite its progressive constitutional jurisprudence, lags in legislative readiness.

Moving forward, India must adopt a constitutional bioethics framework that balances scientific progress with ethical restraint. This includes enacting a comprehensive Human Genome Regulation Act, creating a National Bioethics Commission, recognizing genetic information as sensitive data, and enforcing genetic non-discrimination laws in employment and insurance. These steps will ensure that the fruits of biotechnology are distributed equitably and ethically, and that individual rights are preserved in the face of biological disruption.

The jurisprudence developed in landmark cases such as *Puttaswamy*, *Suchita Srivastava*, *Navtej Johar*, and *Maneka Gandhi* all point toward a common principle: scientific or State action cannot override fundamental rights unless it satisfies the tests of legality, necessity, and proportionality. This principle must serve as the constitutional litmus test for any gene-editing initiative.

At a broader level, the genomic revolution raises existential questions for legal philosophy itself: What does it mean to be human when humanity can be engineered? Who decides the boundaries of permissible alteration? Can dignity survive in a world where bodies are optimized for performance, intelligence, or beauty?

To these questions, the Indian Constitution offers an answer rooted in inclusion, equality, and restraint. It mandates that no matter how powerful science becomes, it must serve human values, not replace them. Dignity, not design, must be the guiding principle of future biological policies.

In this genomic age, where the double helix may be editable but dignity must remain inviolable, constitutionalism must evolve not merely to accommodate science but to guide it. The genome may belong to biology, but its meaning belongs to the law. And in a democracy governed by rights, that law must always begin and end with the Constitution.