Topic 1: Ethical Guidelines for Human Augmentation and Genetic Engineering

United Nations General Assembly

I. Introduction

Human augmentation and genetic engineering refer to the uses of biotechnology and advanced techniques to enhance human physical or mental capacities. While human augmentation includes techniques that make the mind or body stronger or better, genetic engineering involves directly altering an organism's genes to prevent disease or enhance certain traits. These technologies raise deep ethical and moral questions about human identity, equality, safety and the future of humanity.

As techniques like CRISPR advance and develop, the global relevance of this issue is only increased. Prosthetics, neural implants, pharmaceutical implants - what were once theories are now practical applications, with the birth of 'designer babies' in China in 2018 demonstrating the urgent need for international consensus on the boundaries and ethical regulatory frameworks.

UNESCO's Universal Declaration on the Human Genome and Human Rights (1997) specifically addresses genetic modification and states that the 'human genome underlies the fundamental unity of all members of the human family and recognition of their inherent dignity and diversity'. As technological advancements outpace regulations and frameworks, the risk of unethical experimentation, genetic discrimination and heightened global inequalities demands immediate discussion of the issue.

II. Key Terms

Human Augmentation: Technological enhancement of human abilities (physical or cognitive) beyond natural capacities. For example prosthetic limbs, exoskeletons, or brain implants.

Genetic Engineering: The deliberate modification of genetic material (DNA) in living organisms, including humans, in order to alter biological characteristics or functions.

CRISPR-Cas9: Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR), is a revolutionary gene editing technology that allows scientists to precisely target and modify DNA sequences in living cells.

Germline Editing: Genetic modifications that are made to reproductive cells (sperm, eggs, or embryos) that can lead to heritable changes passed to offspring.

Somatic Gene Editing: Genetic modifications made to non-reproductive cells that only affect the individual patient.

Eugenics: The controversial study of genetic engineering where reproduction within a human population is arranged in order to increase the occurrence of heritable characteristics regarded as desirable. This practice raises concerns about 'ableism' and is increasingly discredited as unscientific.

Transhumanism: The belief that human beings should use technology to modify, enhance and improve human cognition and bodily functions to expand capacities beyond current biological constraints.

III. Past International Actions

- *UNESCO Universal Declaration on the Human Genome and Human Rights (1997):* This declaration proclaimed that the human genome is the "heritage of humanity", and provides an ethical framework for genome research, emphasizing how it must respect human rights and dignity, as well as forbidding discrimination on genetic characteristics. It also explicitly bans "reproductive cloning of human beings", considered a practice "contrary to human dignity"

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- Oviedo Convention (1997): The first legally binding European treaty to establish a framework that protects human dignity and identity in biomedicine. It forbids human cloning and emphasizes the informed consent of patients.

- Universal Declaration on Bioethics and Human Rights (2005): Guides States and individuals on principles like informed consent, social justice, and respect for human rights in the face of rapidly advancing life sciences and technologies. It expands on ethical principles for medicine and life sciences.

Aside from many declarations submitted and revised by the UN, individual countries have moved at different paces. For example in 20115 and 2018, scientists held international summits on human gene editing, such as the International Summit on Gene Editing in Washington. These summits managed to bring together leading countries in research (like the US and China), to discuss and agree that clinical germline editing should maintain strict oversight. While these discussions are not legally binding, they have influenced policy debates and regulations.

IV. Timeline of Key Events

1975	Asilomar Conference: establishment of the first global guidelines for recombinant DNA (rDNA) research, which fostered public trust and safety

1997	Dolly the sheep: first cloned mammal sparks global debate on cloning humans.
1997	Oviedo Convention adopted
2003	Human Genome Project completes
2005	UN Declaration on Human Cloning
2012	CRISPR breakthrough: gene editing application of CRISPR-Cas9 developed by Jennifer Doudna and colleagues
2018	First gene-edited babies: He Jianjui announces birth of twins with CRISPR.edited genomes, followed by global outcry
2023	Third international summit (London): stressing the need for international norms and equitable access to therapies and inclusive public engagement

V. Current Situation

The current landscape of human augmentation and genetic engineering presents both unprecedented opportunities and significant challenges. With the human augmentation sector booming, from 341 billion USD in 2024 to an expected 1.1 trillion by 2032, gene therapy treatments for inherited diseases have shown remarkable success, with over 20 approved therapies worldwide. CRISPR-based treatments for sickle cell disease and beta-thalassemia represent major breakthroughs in genetic medicine.

However, the field remains marked by significant ethical and regulatory gaps. Different countries maintain different approaches to genetic research, creating a patchwork of regulations that may enable "regulatory arbitrage" where researchers seek places with more permissive rules. The absence of universal standards poses risks of unsafe experimentation and exploitation of vulnerable populations. Technological advancement continues to outpace regulatory frameworks. Base editing and prime editing technologies offer more precise genetic modifications, while artificial intelligence accelerates the identification of genetic targets. While technology develops at a rapid pace, regulatory talks and summits struggle to keep up the pace.

VI. Major Parties Involved

United States: The United States is a world leader in biotechnology research and development, driving both its innovation and policy in genetic engineering. Legally, the USA has no specific federal law permitting germline editing, however the FDA's funding for embryo editing and research has been barred by Congress, and the NIH forbids funding human germline modifications. Despite some restrictions, the country permits extensive genetic research, and its decentralized regulatory approach and commercial focus raise concerns about the country's consistency and ethical oversight.

China: Following significant government investment and research in biotechnology, China has emerged as a major player in the field. The He Jianjui controversy of the 'designer babies' exposed gaps in Chinese regulatory oversight, leading to the strengthening of laws and penalties. By 2019, China's health regulators drafted strict rules, and in 2020 laws were explicitly amended to ban human genome editing and cloning, punishable by up imprisonment. China advocates for broad consensus-led governance and often emphasizes that developing countries must also benefit from genetic technologies.

European Union: The EU and the member states have a more precautionary and ethics-centered approach, as well as following principles similar to the Oviedo Convention which forbids human cloning.

The EU's restrictive approach, while protecting data and mantainigne ethical frameworks may also limit research opportunities or medical developments. The United Kingdom (former EU member) only allows genome editing for research purposes and still prohibits implementing these edited embryos. Overall the EU supports research yet maintains a very strict stance on their applications and the risk involved.

Russia: Russia has no explicit regulations directly addressing the germline gene editing of embryos for research or clinical purposes, but supports the WHO position against making changes to the human germline. Despite laws prohibiting the creation of human embryos for biomedical products, there was huge uproar in 2019 when Denis Rebrikov (a scientists in Russia's largest fertility clinic) announced intentions of using CRISPR techniques on human embryos. Public discourse on human generic enhancement is limited, and Russia emphasizes national sovereignty over its research, while simultaneously seeking partnerships, for example with China, for biotech products.

Japan: Japan's germline gene editing regulations are looser than in most of the world, but still restricted. Draft guidelines issued in 2018 allow for gene editing of human embryos for research to treat genetic diseases. The guidelines restrict germline gene editing for reproductive purposes and clinical testing but violations are not punishable by law. The guidelines also do not regulate doctors at private hospitals who might use gene editing for treatment; they only regulate researchers. The country's ageing population is a driver for the interest in genetic therapies for age-related diseases, and their technological capabilities and international partnerships contribute to global genetic research efforts.

VII. Key topics to Debate

For an effective debate and resolution of this tropic, the following points of debate are highly recommended to be considered:

- Should germline editing be permitted under any circumstances, and if so, what safeguards are necessary to prevent abuse and ensure safety?

- What measures are needed to ensure equitable access to genetic therapies and prevent genetic technologies from increasing global health disparities? How should the international community address the commercialization of genetic research and potential conflicts between profit and patient welfare?
- Should an international body have the authority to sanction unethical experiments? What mechanisms could ensure compliance across sovereign states?
- Where do we draw the line between acceptable medical therapy and unacceptable enhancement? For example, is editing out a disease gene ethically different from boosting intelligence? How should policies distinguish these cases?
- Do advanced enhancements threaten human dignity or widen social divides? Should there be a ban on "designing" babies with selected traits? How do we protect the privacy and equality of individuals with respect to their genomic data?
- How might genetic enhancement intersect with other concerns (e.g. bioterrorism, gene drives affecting ecosystems) and should genetic engineering of humans be treated alongside international biosecurity measures?
- How can the international community ensure that benefits of genetic technologies (like cures) are shared globally, not just among wealthy countries or people? Does the principle that the genome is "heritage of humanity" imply a duty to share therapies or restrict applications?

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