

Symposium on Natural and Applied Sciences
Hosted Online from London, United Kingdom
Date: 5th November, 2026
Website: https://econferencia.com

PATENTS IN BIOTECHNOLOGY: ETHICAL PROBLEMS AND LEGAL LIMITATIONS

Sardor Shukhratovich Mamanazarov
PhD, Associate Professor, Head of the Department of English Law and European Union Law, Tashkent State University of Law
sardormamanazarov@gmail.com,
s.mamanazarov@tsul.uz,
+998 90 062 90 01
ORCID: 0009-0004-5855-6498

Abstract
This article offers a comprehensive analysis of the ethical and legal aspects of patenting living organisms and genetic material in biotechnology. Its main aim is to assess, from both an ethical and a legal standpoint, the problems raised by establishing property rights over life, to analyse international experience, and to develop practical recommendations for Uzbekistan. The study uses comparative legal analysis, ethical analysis, and socio-cultural and systemic approaches.
The article examines Vandana Shiva's theory of biopiracy, Leon Kass's concerns about human dignity, Jeremy Rifkin's "playing God" argument, the UNESCO bioethics declarations, and the attitudes of various religious traditions towards biotechnology patents. The main findings are as follows: patents on living organisms are perceived differently across religious and cultural traditions; ethics committees and institutional oversight are necessary; compulsory licensing is an effective mechanism; and public order exceptions are important for ethically questionable inventions such as "Terminator Seed" technology.



Symposium on Natural and Applied Sciences
Hosted Online from London, United Kingdom
Date: 5th November, 2026
Website: https://econferencia.com

The article also notes that ethics committees have not yet been established in Uzbekistan, describes the shortcomings this caused during the COVID-19 pandemic, and discusses educational initiatives and raising public awareness. The results can be used to reform biotechnology legislation, to build a system of ethical oversight, and to develop a balanced bioethics policy for Uzbekistan. The conclusion stresses the need to balance ethical principles, legal limitations and the needs of innovative development in the area of life patents.

Keywords: life patents, bioethics, genetic material, ethics committees, compulsory licensing, religious views, human genome, living organisms, legal limitations, biotechnology legislation.

With the rapid development of biotechnology, the patenting of living organisms and their parts has become one of the most pressing problems of modern law and ethics. Establishing property rights over genetic material, commercialising living organisms and patenting the code of life raise not only legal questions but also profound ethical and cultural ones.

As modern biotechnological innovation reaches the most fundamental layers of life, DNA sequences, genes and genetic material, traditional concepts of patent law have been forced to change. The idea of "property rights over life" is received differently in different cultures and religions, which makes it difficult to find a single solution at the international level.

The main aim of this article is to assess, ethically and legally, the problems of establishing property rights over life, to analyse international experience, and to develop practical recommendations for Uzbekistan. The central question it addresses is how to strike a balance between ethical principles and legal limitations in biotechnology.



For a developing country such as Uzbekistan, this question is of strategic importance. A well-designed biotechnology patent policy can strengthen the national innovation system, foster international cooperation and help achieve progress in healthcare.

The study applies comparative legal analysis, ethical analysis, and socio-cultural and systemic approaches.

In biotechnology patents, the question of property rights over life is central to drawing ethical boundaries. Shiva (1997) highlights the ethical dimension of owning life: “Patenting life is the final stage in the commercialisation of nature.” This creates a tension between scientific research and the social responsibility of patent policy.

As the international bioethics survey conducted by Darryl Macer (1994) showed, public attitudes towards biotechnology patents are complex and depend on cultural context. Concerns about human dignity and the ethical impact of patents on genetic material are among the key issues. As Kass (2002) points out, “patenting genetic material may be contrary to human dignity.”

Ethical debates on biotechnological innovation are closely tied to the “playing God” argument. As Rifkin (1998) wrote in The Biotech Century: “When we rewrite the code of life, we take on the role of God.”

This argument points to the risk that biotechnological innovation interferes with the natural order and alters the basic principles of life. Genetic modification, the creation of artificial life and deep intervention in biological processes are matters of concern for many religious and philosophical systems.

Concerns about the commercialisation of life, and about applying market-based approaches to genetic resources, are also major ethical issues. Ethically, can anyone hold property rights over a product of their own mind, a product of nature, the product of an engineered process, a discovery, or even an invention? This

question is central to applying Locke's labour theory to biotechnology, because it allows us to assess the ethical limits of controlling living and scientific resources through patents and intellectual property.

Ethics committees play an important role in overseeing the patenting of living organisms and their parts and in ensuring that biotechnology research within institutions complies with ethical standards. They are sometimes also called independent ethics committees, ethical review boards or research ethics boards.

As Mohamadi, Asghari and Rashidian (2014) note, the main purpose of ethics committees is to ensure that research participants are not harmed or, where some harm is unavoidable, that it is minimal and outweighed by the benefits of the research. These boards have formal authority to approve or reject, monitor and review research, and in some countries they are a legal requirement.

In the United States, the Good Clinical Practice (GCP) standards set by the FDA make the role of ethics committees in biotechnology research even more important. National bioethics commissions, and the ethical foundations of their biotechnology policy recommendations, are of great significance in defining the legal and moral aspects of research. For example, the US National Bioethics Advisory Commission (1997–2001) and the President's Council on Bioethics (2001–2009) produced recommendations on biotechnology patents.

The way biotechnology patents are received in different religious traditions is also an important issue. Islamic, Christian, Hindu and other religious views differ in their attitudes towards biotechnology patents.

A study by Ted Peters (2007) analysed the attitudes of various religious traditions towards biotechnology patents. In the Christian tradition the dominant view is that life is a gift from the Creator, while in the Islamic tradition there is a view that human beings, through the reason given to them by Allah, have the right to make use of natural resources.





The Universal Declaration on the Human Genome and Human Rights, adopted by UNESCO in 1997, is one of the international instruments that seeks to balance these approaches. Adopted at the 29th session of UNESCO's General Conference, it recognises the human genome as "the heritage of humanity". The Declaration:

- recognises the sanctity of genetic material;
- prohibits using the human genome in its natural state to obtain financial gain (Article 4);
- requires that genome-related research be carried out with respect for human rights, fundamental freedoms and human dignity.

Compulsory licensing is an effective way to address problems of access and patent monopolies in biotechnology. It is a mechanism by which the state grants third parties the right to use a patented invention without the patent holder's consent, but in return for fair compensation.

The mechanism is set out in Article 31 of the TRIPS Agreement and may be applied in cases of national emergency, public need or anti-competitive practices (Correa, 2007).

The main advantages of compulsory licensing in biotechnology are that it:

- preserves the patent holder's incentive, because fair compensation is paid;
- secures society's access to biotechnological advances, especially life-saving medicines;
- can be an effective tool for solving the "anticommons" problem (Reichman, 2009).

International experience also shows that compulsory licensing works. For example, Brazil, India and Thailand successfully applied compulsory licences to HIV/AIDS medicines (Beall and Kuhn, 2012). According to the World Health Organization (2006), these measures cut drug prices by up to 80–90% and made it possible to save many patients' lives.

Many developed countries apply public order or ethical limitation rules in their patent laws. Article 53(a) of the European Patent Convention (2020) provides that patents shall not be granted for inventions contrary to public order ("ordre public") or morality. This approach is especially important in biotechnology, because inventions involving living organisms and genetic material often raise ethical questions.

The United States has no formal public order exception, but there is a precedent in Lowell v. Lewis (1817). In that case Justice Story stated that a patent should not be granted if the invention is "frivolous or injurious to the well-being, good policy, or sound morals of society."

A striking example of why a public order exception is needed in biotechnology is "Terminator Seed" technology. This technology makes seeds sterile and threatens to destroy farming practices that are thousands of years old. Patented by Monsanto, it provoked strong protest worldwide (RAFI, 1999). "Terminator seeds", or Terminator technology (also known as Genetic Use Restriction Technology, GURT), are crops genetically modified to produce seeds that are sterile or will not germinate after the first harvest.

Educational initiatives are essential if the public is to understand and evaluate the biotechnology patent system properly. Research by the US National Science Foundation (2020) shows that people with higher levels of education tend to have more positive and more scientifically grounded attitudes towards biotechnology patents.

Education improves public scientific knowledge and understanding of the patent system, which in turn enables effective public participation in bioethics, intellectual property and innovation policy.

In the course of our research we found that ethics committees in the field of biotechnology have not yet been established in Uzbekistan. In particular,

interviews with practitioners in the field confirmed that the absence of an ethical review mechanism caused problems when patents were sought for biological COVID-19 preparations during the pandemic.

Therefore, taking into account the specific and sensitive nature of biotechnology, it is important for Uzbekistan first to establish ethics committees on a sound organisational and legal footing and to put them into practice. This would not only strengthen the national innovation system but also enable biotechnology research to be conducted in line with international standards.

In conclusion, the following measures are recommended to address intellectual property problems in biotechnology in Uzbekistan.

1. Create a hierarchical system of norms. This system should include three levels:

a) things that cannot be the object of property rights at all (for example, human genome sequences);

b) things that may be the object of property rights but cannot be patented (for example, basic research tools);

c) inventions that are patentable in principle but for which patents are refused on moral grounds (for example, human cloning technologies).

2. Establish biotechnology ethics committees and regulate their work by law. These committees should oversee the ethical aspects of biotechnology research and patenting and issue recommendations consistent with national values.

3. Introduce compulsory licensing into national legislation and ensure access to vital biotechnology products. The mechanism could be applied especially to biotechnological inventions in medicine.

4. Set clear ethical limits in national patent law. The public order exception is of particular importance for Uzbekistan, as the country has a rich agricultural culture and an interest in preserving traditional knowledge.

5. Develop international cooperation and facilitate technology transfer in biotechnology. This is necessary to build Uzbekistan's biotechnology capacity and to attract foreign investment.

6. Raise public awareness and develop the education system to spread information on biotechnology patent issues. A comprehensive educational strategy on these issues should be developed for Uzbekistan.

In the context of modern biotechnological development, Uzbekistan should, taking into account its unique geographical and cultural characteristics, shape a patent policy that reconciles innovative development with ethical principles. This would not only open up new opportunities for the national economy but also strengthen Uzbekistan's reputation in the international biotechnology community. The findings of this study show that balancing ethical principles, legal limitations and the needs of innovative development in the area of life patents is of strategic importance for Uzbekistan. The ethical and legal aspects of patenting living organisms are not merely a technological matter: they are a strategic issue bound up with the future of society and the common interests of humanity.

References

1. Beall, R., Kuhn, R. (2012). Trends in Compulsory Licensing of Pharmaceuticals Since the Doha Declaration: A Database Analysis. PLOS Medicine, 9(1), e1001154. https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001154
2. Correa, C.M. (2007). Trade Related Aspects of Intellectual Property Rights: A Commentary on the TRIPS Agreement. Oxford University Press.
3. European Patent Convention. (2020). Article 53. European Patent Office. Available at: https://www.epo.org/en/legal/epc

4. Kass, L. (2002). Life, Liberty and the Defense of Dignity. Free Press.
5. Lowell v. Lewis, 15 F.Cas. 1018 (C.C.D.Mass. 1817). Available at: https://unctad.org/ippcaselaw/sites/default/files/ippcaselaw/2020-12/Lowell%20v.%20Lewis%2C%20United%20States%20%281817%29.pdf
6. Macer, D. (1994). Bioethics for the People by the People. Eubios Ethics Institute.
7. Mohamadi, A., Asghari, F., Rashidian, A. (2014). Continuing review of ethics in clinical trials: a surveillance study in Iran. Journal of Medical Ethics and History of Medicine, 7, 22. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4648212
8. National Bioethics Advisory Commission. (1997). Cloning Human Beings: Report and Recommendations. NBAC. Available at: https://bioethicsarchive.georgetown.edu/nbac/pubs/cloning1/cloning.pdf
9. National Science Board. (2020). Science and Technology: Public Attitudes, Knowledge, and Interest. NSF. https://files.eric.ed.gov/fulltext/ED612113.pdf
10. Peters, T. (2007). Playing God?: Genetic Determinism and Human Freedom. Routledge.
11. RAFI. (1999). The Gene Giants: Masters of the Universe? RAFI Communiqué. https://www.etcgroup.org/sites/www.etcgroup.org/files/publication/pdf_file/RAFIcom62GeneGiants.pdf
12. Reichman, J.H. (2009). Compulsory Licensing of Patented Pharmaceutical Inventions. Journal of International Economic Law, 12(2), 357–426. Available at: https://ssrn.com/abstract=1589526

13. Rifkin, J. (1998). The Biotech Century: Harnessing the Gene and Remaking the World. Jeremy P. Tarcher/Putnam.
14. Shiva, V. (1997). Biopiracy: The Plunder of Nature and Knowledge. South End Press.
15. UNESCO. (1997). Universal Declaration on the Human Genome and Human Rights. UNESCO.
16. UNESCO. (2005). Universal Declaration on Bioethics and Human Rights. https://www.unesco.org/en/ethics-science-technology/bioethics-and-human-rights
17. WHO. (2006). Public Health, Innovation and Intellectual Property Rights: Report of the Commission on Intellectual Property Rights, Innovation and Public Health. WHO. Available at: https://www.who.int/publications/i/item/9241563230
18. WIPO. (2004). WIPO Intellectual Property Handbook: Policy, Law and Use. WIPO.

ss