

Ethics in Biotechnology Quiz Questions and Answers PDF

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What are the ethical challenges associated with ensuring equitable access to biotechnology advancements?

The ethical challenges include ensuring fair distribution of biotechnological benefits, preventing exploitation of marginalized communities, and addressing disparities in access to healthcare and resources.

Which of the following are ethical principles in biotechnology?

- Autonomy** ✓
- Justice** ✓
- Sustainability
- Beneficence** ✓

Ethical principles in biotechnology include respect for autonomy, beneficence, non-maleficence, and justice. These principles guide the responsible use of biotechnological advancements to ensure they benefit society while minimizing harm.

Discuss the potential ethical implications of using CRISPR technology in human gene editing.

The use of CRISPR technology in human gene editing raises significant ethical concerns, such as the risk of unintended genetic changes, the moral implications of altering human embryos, issues of consent, and the potential for exacerbating social inequalities through unequal access to genetic enhancements.

What is a major ethical concern in personalized medicine?

- Cost
- Efficacy
- Accessibility
- Privacy ✓

A major ethical concern in personalized medicine is the potential for genetic discrimination, where individuals may face unfair treatment based on their genetic information. This raises issues of privacy, consent, and equity in healthcare access.

How do cultural beliefs influence public perception of biotechnology? Provide examples.

Cultural beliefs influence public perception of biotechnology by shaping attitudes towards its applications, such as genetic modification and environmental impact. For instance, in cultures that emphasize traditional agricultural practices, there may be resistance to GMOs, whereas cultures that prioritize innovation may support biotechnological solutions.

What are some ethical concerns associated with genetic modification?

- Environmental impact ✓

- Economic inequality** ✓
- Increased crop yield
- Privacy of genetic data** ✓

Genetic modification raises ethical concerns such as potential harm to biodiversity, the risk of unintended consequences, issues of consent, and the moral implications of 'playing God' with living organisms.

Which ethical issues are associated with the use of GMOs?

- Food safety** ✓
- Environmental impact** ✓
- Improved nutrition
- Economic inequality** ✓

The use of GMOs raises ethical concerns regarding environmental impact, food safety, corporate control over seeds, and potential health risks to consumers.

What is the ethical concern related to the confidentiality of genetic information?

- Environmental impact
- Cost
- Accessibility
- Privacy** ✓

The ethical concern related to the confidentiality of genetic information primarily revolves around the potential for discrimination and privacy violations, as individuals may face risks of stigmatization or exclusion based on their genetic predispositions.

What are some challenges in regulating biotechnology?

- Rapid technological advancement** ✓
- High cost of research
- Public opposition** ✓
- Lack of international consensus** ✓

Regulating biotechnology faces challenges such as rapid technological advancements, ethical concerns, and varying international standards, which complicate the establishment of consistent policies.

Which technology is most associated with ethical debates around genetic modification?

- CRISPR** ✓

- Ultrasound
- X-ray
- MRI

CRISPR technology is at the forefront of ethical debates surrounding genetic modification due to its ability to edit genes with high precision, raising concerns about potential misuse and long-term impacts on human genetics.

In your opinion, what future ethical challenges might arise with the development of synthetic biology? Explain your reasoning.

Future ethical challenges in synthetic biology may include concerns about biosecurity, the potential for unintended ecological consequences, and the moral implications of creating and manipulating living organisms.

Which of the following is a key ethical issue in stem cell research?

- Energy consumption
- Water pollution
- Noise pollution
- Use of embryonic cells ✓**

A key ethical issue in stem cell research is the moral status of embryos, particularly whether it is ethical to use human embryos for research purposes. This debate often centers around differing beliefs about when life begins and the rights of embryos versus the potential benefits of stem cell therapies.

Which historical event is often cited in discussions about cloning ethics?

- Human Genome Project
- CRISPR development
- Discovery of DNA
- Dolly the sheep ✓**

The cloning of Dolly the sheep in 1996 is often cited in discussions about cloning ethics, as it raised significant questions about the implications of cloning technology on identity, individuality, and the moral

status of cloned beings.

Explain the ethical principle of autonomy and its relevance in biotechnology.

The ethical principle of autonomy refers to the right of individuals to make their own choices and decisions regarding their personal health and body, which is crucial in biotechnology for ensuring informed consent and respect for individual preferences in genetic and medical interventions.

What are the potential benefits of biotechnology in medicine?

- Personalized treatment ✓**
- Reduced healthcare costs ✓**
- Increased privacy risks
- Faster drug development ✓**

Biotechnology in medicine offers numerous benefits, including the development of targeted therapies, improved diagnostics, and personalized medicine, which enhance treatment efficacy and patient outcomes.

Describe a real-world case where biotechnology raised significant ethical concerns and explain the outcomes.

The He Jiankui case, where CRISPR was used to create genetically edited twins, raised ethical concerns about consent and safety, leading to global condemnation and legal actions.

What is the term for the fair distribution of biotechnology benefits and risks?

- Autonomy
- Beneficence
- Non-Maleficence
- Justice ✓**

The term for the fair distribution of biotechnology benefits and risks is 'biotechnology equity.' This concept emphasizes the need for equitable access to biotechnological advancements and the fair sharing of associated risks among different populations.

Which international protocol focuses on the safe handling of living modified organisms?

- Kyoto Protocol
- Montreal Protocol
- Paris Agreement
- Cartagena Protocol ✓**

The Cartagena Protocol on Biosafety is the international agreement that focuses on the safe handling, transport, and use of living modified organisms (LMOs). It aims to protect biological diversity from the potential risks posed by LMOs resulting from modern biotechnology.

Which technologies are involved in ethical debates about biotechnology?

- CRISPR ✓**
- MRI
- Cloning ✓**
- Stem cell research ✓**

Ethical debates about biotechnology often involve technologies such as genetic engineering, CRISPR, cloning, synthetic biology, and biopharmaceuticals.

What is the primary ethical principle that ensures biotechnology advancements do more good than harm?

- Autonomy
- Beneficence ✓**
- Non-Maleficence
- Justice

The primary ethical principle that guides biotechnology advancements is the principle of beneficence, which emphasizes the obligation to maximize benefits and minimize harm to individuals and society.