

DEI - INFORMED DIALOGIC LESSON PLAN

Class: Foundations and Applications of Synthetic Biology (Undergraduate Class)

Week # and Title: 5 - Ethical implications of synthetic human genomes

Lesson Focus and Goals:

- Exploring the ethical implications of designing, manipulating and editing human genomes through synthetic biology.
- Students will understand the scientific foundations and ethical debates surrounding synthetic biology applications in human genetics.
- Student will develop critical analysis skills to evaluate the benefits and risks of human genome editing and synthesis technologies.

Materials Needed:

- Pre-class readings: Articles on genome editing and synthesis technologies

Learning Objectives:

- Critical analysis of the ethical issues surrounding synthetic human genomes
- Application of ethical frameworks to evaluate the potential consequences of human genome technologies on society.

Structure/ Activity:

1- Warm-up activity:

Students will discuss in pairs this question: *What are your initial thoughts on editing the human genome? What ethical issues do you think should be addressed?*

2- Mini-lecture:

Introduction to genome editing technologies and related ethical controversies.

3- Open-ended Dialogic Discussion:

Discuss potential risks and benefits of human genome editing technologies.

Designer babies as a case study: Should we allow the editing of human embryos to eliminate genetic diseases, and what ethical boundaries should exist?

4- Problem-solving activity:

Students will work in groups to propose a policy for regulating human genome editing considering potential benefits and risks.

5- Reflection activity:

Students will share their personal reflection with regard to this question: *How does the ethical debate around synthetic human genomes challenge your understanding of scientific progress?*

Assessment:

Formative Assessment:

- **Participation:** Active involvement in discussions and problem-solving activities.
- **Group Project:** Assessment of the policy proposal based on feasibility, inclusivity, and ethics.
- **Reflection:** Thoughtfulness in analyzing the ethical implications of synthetic human genomes.