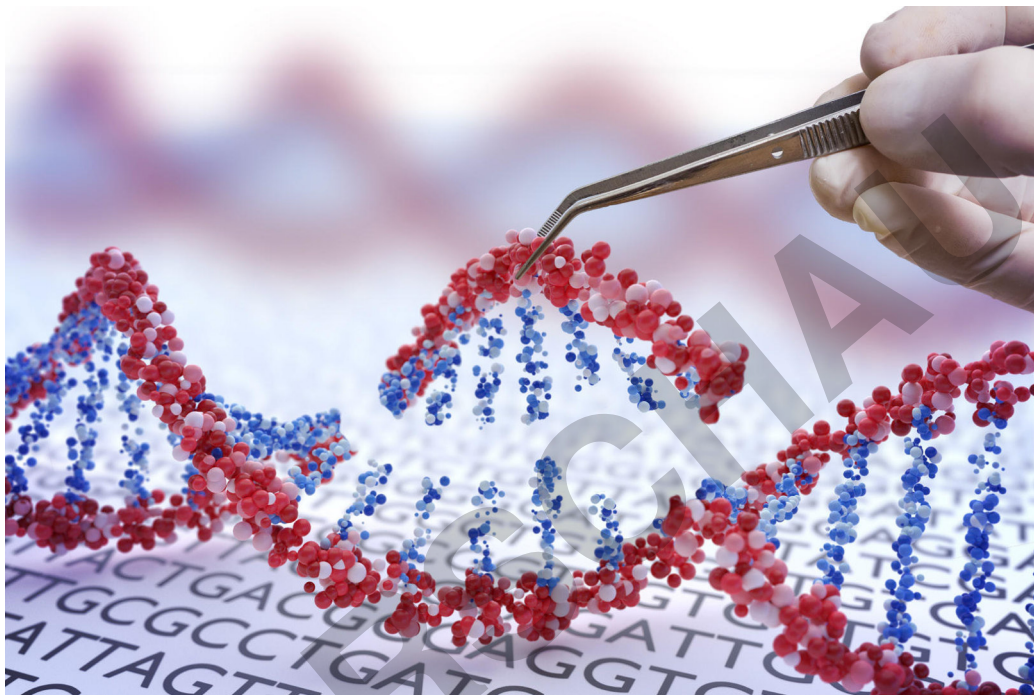


## B.VII.24

### Advanced skills – Case studies

# Positive and negative aspects of biotechnology – Discussing a controversial issue

Nach einer Idee von Rainer Jacob



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Die aktuellen Fortschritte in Biotechnologie, Gentechnik und Genterapie werfen viele Fragen auf: Können wir in Zukunft unheilbare Krankheiten heilen und Gendefekte reparieren? Dürfen wir Gene verändern, die Charaktereigenschaften und äußere Erscheinung von Embryonen im Labor vorherbestimmen, „Designerbabys“ erschaffen und das Leben verlängern? In dieser Einheit lernen die Schülerinnen und Schüler Errungenschaften und Anwendungsgebiete der Biotechnologie, insbesondere im medizinischen Bereich, kennen. Sie diskutieren positive und negative Aspekte der neuesten Entwicklungen, erkennen Grenzbereiche und setzen sich mit ethischen Fragen auseinander.

#### KOMPETENZPROFIL

<b>Niveau:</b>	B1
<b>Dauer:</b>	12 Unterrichtsstunden
<b>Kompetenzen:</b>	1. Leseverstehen: Zeitungsartikel und Sachtexte verstehen und auswerten; 2. Hör-Seh-Verstehen: Informationen aus Videos entnehmen und mit Filmen arbeiten; 3. Schreiben: <i>comments</i> verfassen; 4. Medienkompetenz: Internetrecherchen durchführen
<b>Thematische Bereiche:</b>	<i>visions of the future, biotechnology, genetic engineering</i>



## Auf einen Blick

### 1./2. Stunde

**Thema:** An introduction to biotechnology

**M 1** **The application areas of biotechnology** / Lesen eines Informationstextes (EA); Vervollständigen einer Mindmap (PA); Durchführen einer Internetrecherche (EA); Schreiben eines *comment* (EA)

**Benötigt:**  digitale Endgeräte und Internetzugang

### 3.–6. Stunde

**Thema:** Genetic engineering

**M 2** **Worksheet – Gene therapy** / Zuordnen von Begriffen und Definitionen (PA); Anschauen eines Videos (EA); Bearbeiten von Hör-Seh-Verstehensaufgaben (EA); Durchführen einer Internetrecherche (EA)

**M 3** **Gene therapy in real life – Curing blindness** / Anschauen und Auswerten eines Videos (UG); Lesen eines Zeitungsartikels (EA); Bearbeiten einer *true-false*-Aufgabe (EA); Erläutern englischer *phrases* (EA); Auswerten des Artikels (PA); Durchführen einer Internetrecherche (GA); Ziehen eines Fazits (UG)

**Benötigt:**  digitale Endgeräte und Internetzugang

### 7.–10. Stunde

**Thema:** Gene editing

**M 4** **Gene editing – The future of medicine?** / Lesen eines Informationstextes (EA); Beantworten von Leseverstehensaufgaben und Auswerten des Textes (EA); Sammeln von Pro- und Kontra-Argumenten (GA); Beschreiben und Kommentieren eines Cartoons (EA); Schreiben einer Rede (EA)

**M 5** **The controversy of gene editing** / Lesen eines Zeitungsartikels (EA); Beantworten von Leseverstehensaufgaben (EA); Zuordnen von Begriffen und Definitionen (EA); Auswerten des Artikels (PA); Schreiben eines *comment* (PA)

## 11./12. Stunde

**Thema:** Human cloning in film

**M 6** **Human cloning – Working with different films** / Anschauen eines Films und Durchführen einer Recherche (GA); Präsentieren des Films, dessen Themen und der eigenen Kritik (GA)

**Benötigt:**

- digitale Endgeräte und Internetzugang
- Zugriff auf die Filme *Gattaca*, *Never Let Me Go* und *My Sister's Keeper* sowie ggf. weitere Filme

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### Minimalplan

Sie haben nur drei Doppelstunden zur Verfügung? So können Sie die wichtigsten Inhalte erarbeiten:

1./2. Stunde: An introduction to biotechnology M 1  
3./4. Stunde: Genetic engineering M 2  
5./6. Stunde: Gene editing M 4

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### Zusatzmaterial im Online-Archiv bzw. in der ZIP-Datei

ZM1\_Vocabulary list Vokabelliste



VORSCHAU

## Worksheet – Gene therapy

M 2

### Tasks

1. Matching exercise: Before watching the video, try to match the terms and definitions.



<b>1 enzyme</b>	a) any of a large group of submicroscopic agents that reproduce only in living cells and are disease-producing in humans, animals, and plants.
<b>2 protein</b>	b) the central, essential, or highly concentrated part around which other parts are grouped; stores genetic information
<b>3 immune system</b>	c) a substance made up of nitrogen, carbon, oxygen, hydrogen, and possibly other elements – found in all living things and a necessary part of life processes
<b>4 DNA</b>	d) the act or process of changing
<b>5 mutation</b>	e) the smallest particle that possesses all the characteristic physical and chemical properties of an element or compound
<b>6 molecule</b>	f) the organs and processes of the body that provide resistance to infection and toxins
<b>7 virus</b>	g) a protein that helps a chemical reaction take place within a living organism
<b>8 nucleus</b>	h) any of several acids present in nearly all living organisms; carrier of genetic information

2. Watch the video *Gene Therapy Basics* on YouTube:  
[https://raabe.click/um\\_en\\_gene\\_therapy\\_basics](https://raabe.click/um_en_gene_therapy_basics) [last access: 18/11/2022].

Tick the correct answer.

- a) The video is about ...
- the latest genetic research.
  - gene therapy.
  - designer babies.
  - in vitro fertilisation.
- b) Dr Michele Calos talks about ...
- her research at the university.
  - the misuse of genetic engineering.
  - gene mutation.
  - reservations against gene therapy.
- c) Dr Calos says that gene mutations ...
- are not inherited.
  - can cause disease.
  - can be prevented.
  - depend on people's way of living.



7. Describe the cartoon and comment on its message. If you need help, use the TIP box below.



'THIS DESIGNER BABY IS  
NO LONGER FASHIONABLE'

© CartoonStock

#### Tips for describing and commenting on a cartoon

To deal with this assignment properly, you have to give a description of the cartoon and interpret the hidden meaning. Be careful to work out both parts of the task evenly and do not underestimate the importance of a precise description of the drawing. You must mention the most important graphic elements. Do not merely „talk about“ the cartoon. In your explanation of what the artist wants to say, you should always refer to the cartoon.

8. “We must not stop gene editing research just because some people argue we are heading towards a society of designer babies.” Write a speech on this statement. If you need help, use the TIP box below.

#### Tips for writing a speech

When writing a speech, put yourself into the position of a speaker who addresses a larger audience. Include formal elements such as “Ladies and Gentlemen” to begin with or “Thank you very much” at the end of your speech. It would be a good idea to organise your speech into three parts:

1. introduction (presenting the problem, theme, subject)
2. argumentation (supporting your own view)
3. conclusion (summary)

## M 6

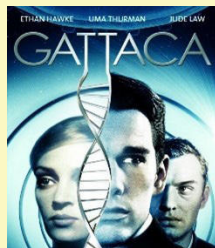
## Human cloning – Working with different films



## Task

Choose one of the following films. In groups, design either a poster or a digital presentation which contains general information on the chosen work, its contents and themes. Present your results and give reasons for your appreciation/criticism of the film.

If you know other films which fit the topic, you may also choose one of those!



## Option A

Film: *Gattaca* (1997)

© *Gattaca* (1997) Jersey Films/Columbia Pictures



## Option B

Film: *Never Let Me Go* (2010)

**TIP:** The film is based on a novel by Kazuo Ishiguro. Explain why the novel is set in the "late 1990s" – before the publication of the novel in 2005.

© *Never let me go* (2010) DNA Films/Film4 Productions/Fox Searchlight Pictures



## Option C

Film: *My Sister's Keeper* (2009)

© *My sister's keeper* (2009) New Line Cinema/Curmudgeon Films/Warner Bros. Pictures



## Useful tips for your presentation

- Present the basic facts of the film: title, year, director, main actors, whether it is based on a novel, short summary of the plot.
- What are the major themes of the film? Which (controversial) issues does it touch upon? How does it connect to the things you have learned in this unit?
- Give a short overview of the general reception of the film. Which aspects of the film were received positively by the audience? Which aspects were criticised?
- Do you like/dislike the film? Why?