



Aalto University  
School of Chemical  
Technology

# Cell Biology CHEM-E8120

Course overview

*Course based on the materials  
and course structure created  
by Prof. Alexander Frey.*

# In case of questions...

- If you have questions, please ask after lectures or send email ([sesilja.aranko@aalto.fi](mailto:sesilja.aranko@aalto.fi))
- Usually answering within a day (if not answering within couple of days, please remind!)
- For questions related to enrollment etc. practical issues, also learning services can help

# Prequestionary – who are you?

- Where are you from and what are you interested in?
- <https://presemo.aalto.fi/cellbpreq>



# Learning outcomes

## After the course you will be able to:

- Appreciate the different levels of biological organization, from molecules to cells
- Understand the biological processes critical for cellular functioning
- Can integrate the different processes into the proper cellular context
- Asses the function of regulatory pathways and networks at the cellular level
- Describe the general principles of gene organization and expression
- Critically analyze experimental data

*Focus on eukaryotes*

# Course content

**12 lectures, two assignments, and a final exam:**

- **Assignment I is a group assignment**, in which you will work jointly on **an essay**.
- **In assignment II**, you will be given a real example of research data from a scientific article.
- In the **final exam** you will apply the learnings from the course to **analyze scientific data** that is related to the course topics.

# Study materials

- Text book:
  - Molecular biology of the cell / Bruce Alberts, Alexander Johnson, Julian Lewis, David Morgan, Martin Raff, Keith Roberts, Peter Walter, 6th edition, Published: Garland Science, New York, 2014.
  - See slides for pages/chapters covered.
- Lecture notes made available via MyCourses pages
- Other material made available via MyCourses pages

# Alternative text book

- Molecular Cell Biology
  - Lodish, Berk, Kaiser, Krieger, Scott, Bretscher, Ploegh Matsudaira, published by Freeman and Company

# Lectures

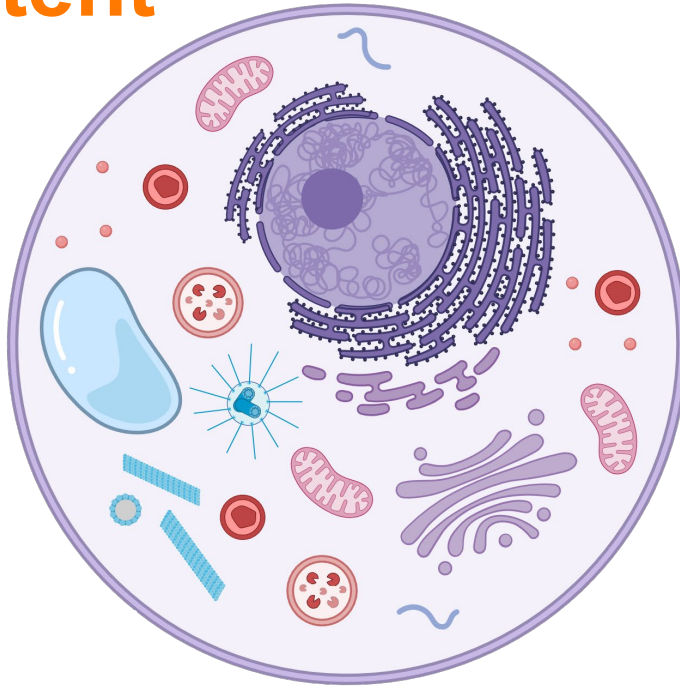
- Lecture materials are based on the textbook
  - They are used illustrate and discuss selected topics
  - You will need to also study the book in addition to lectures
  - Lectures will support your learning and the assignments



# Evaluation and Grading of course

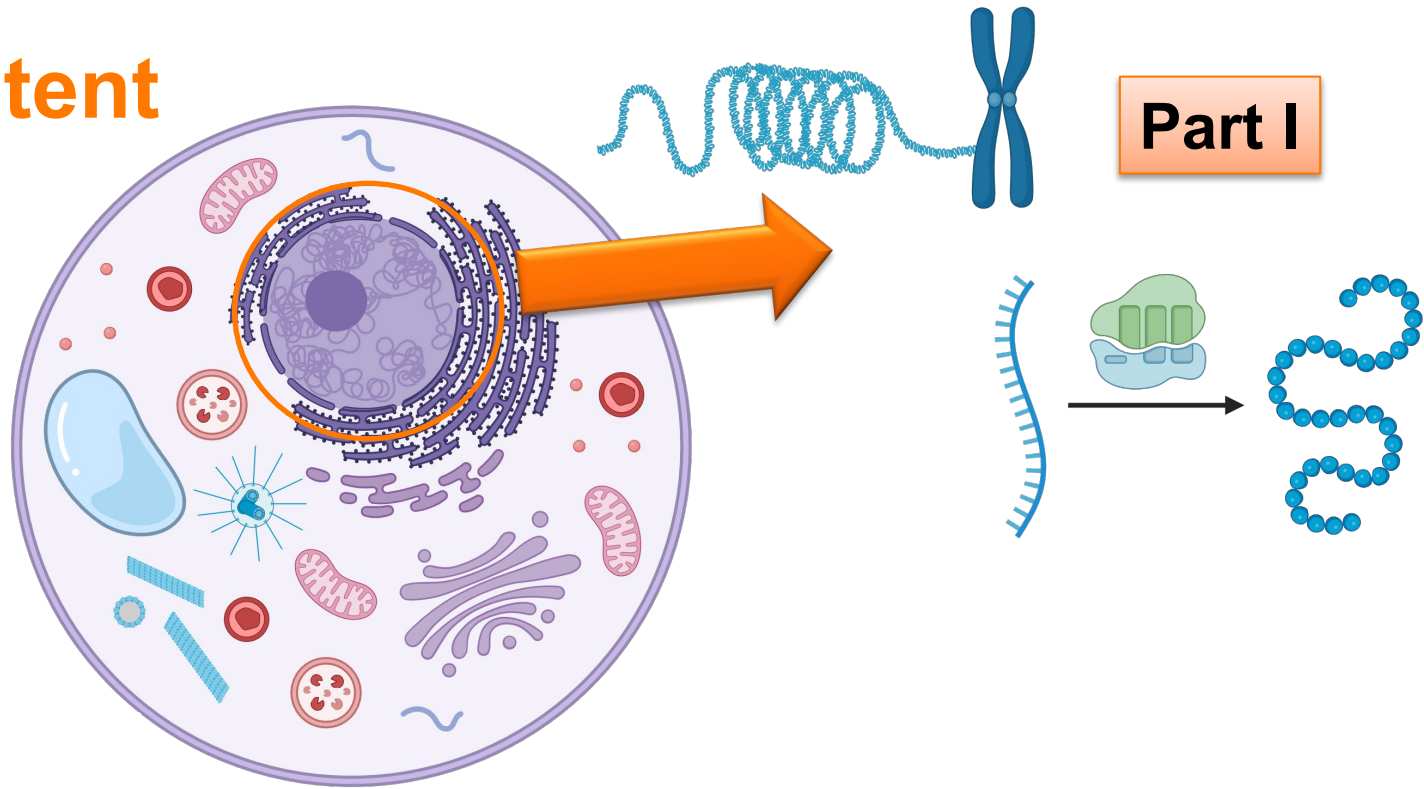
- **Grading is based on:**
  - **Examination (50%)**
  - **Assignments (50%)**
    - **Assignment I (Essay) (30%)**
    - **Assignment II (Research paper) (20%)**
  - **Grading:** Fail, 1 – 5;
  - **Instructions for assignments and evaluation criteria are provided on the course homepage**

# Content

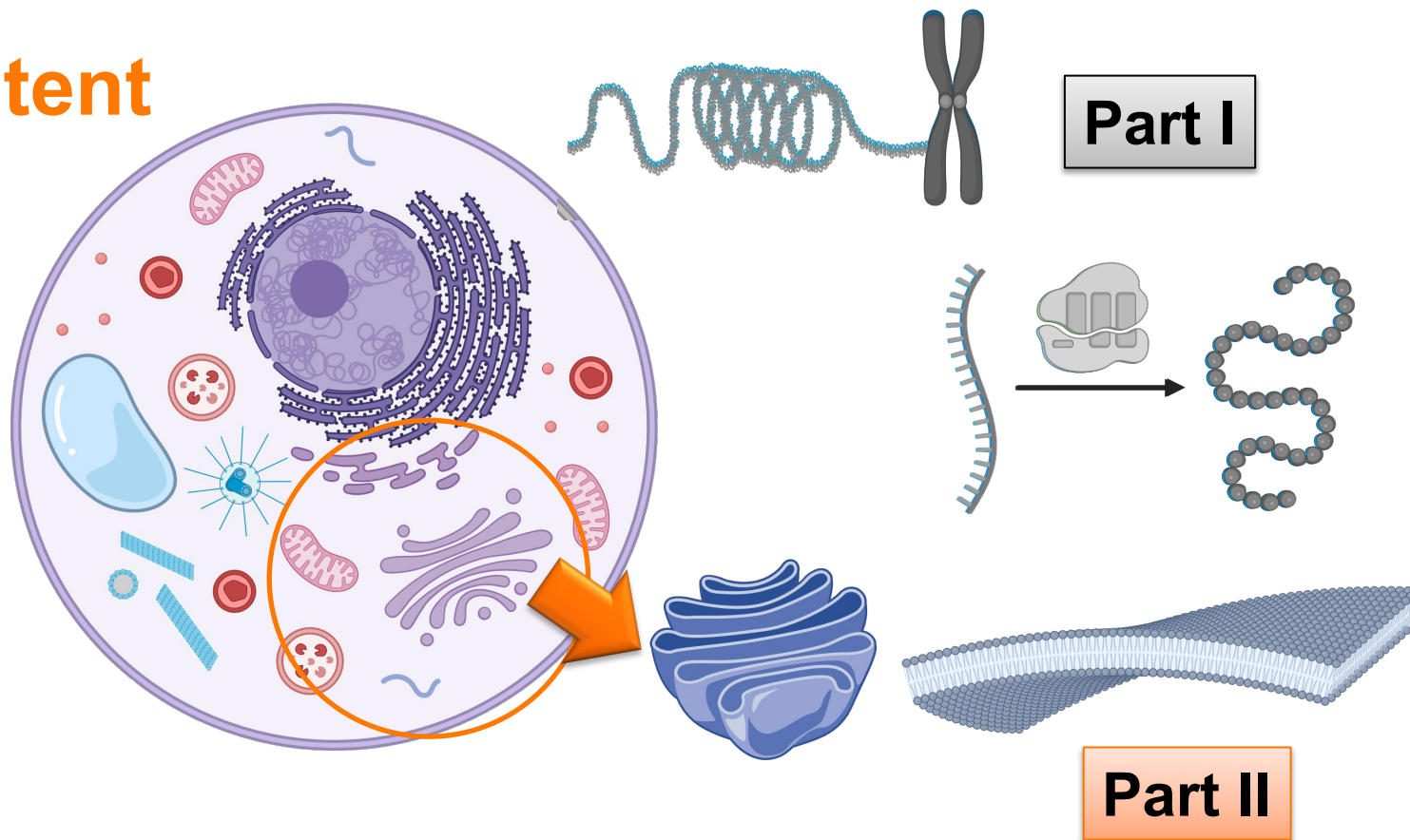


## *The Cell*

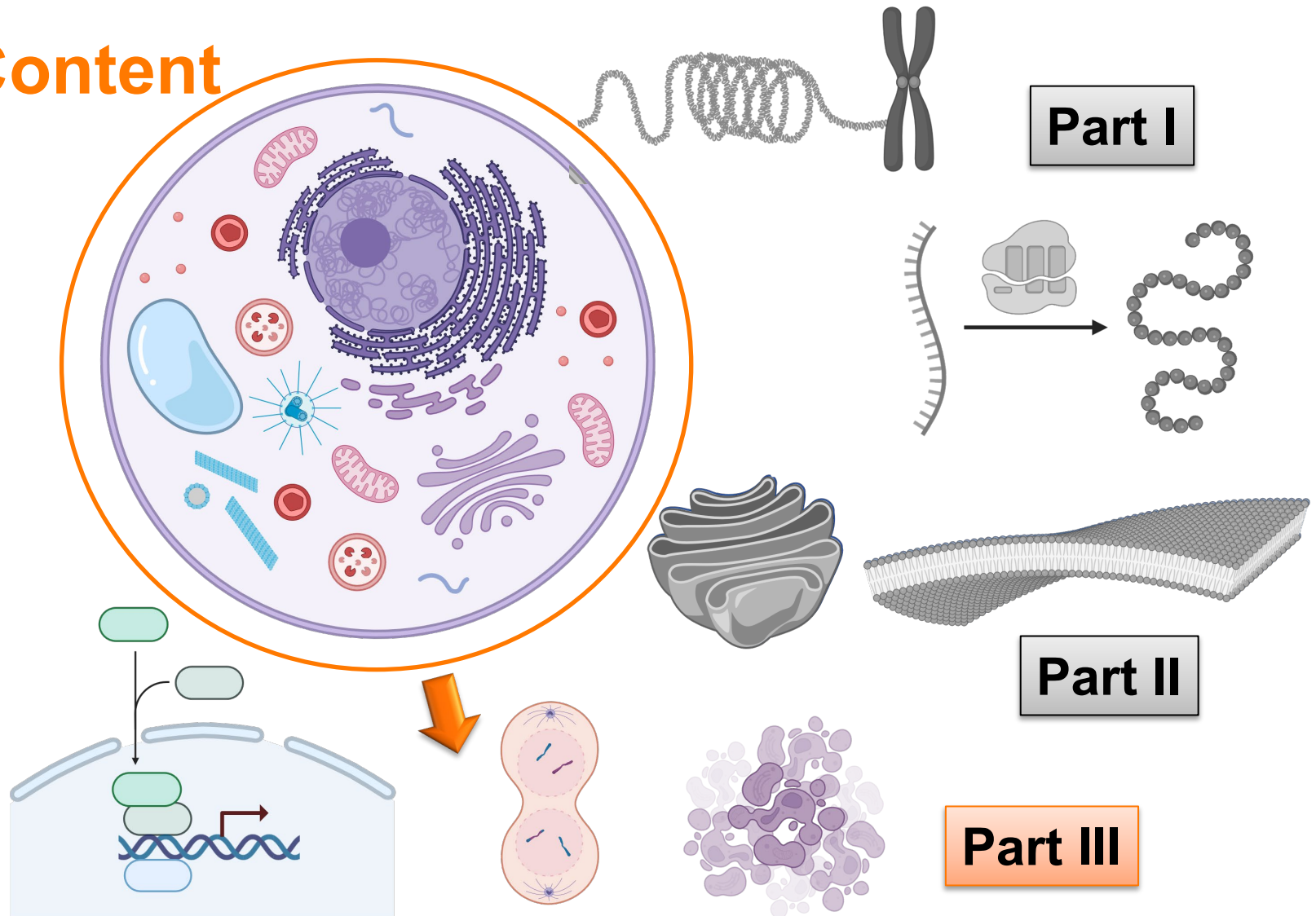
# Content



# Content



# Content



# Course overview – Tentative schedule

Date	Lecture		Chapters & Topics	Assignments
25.10.	1	Part 1	<i>Course overview</i> , DNA, Chromosomes, Genome, Ch. 4	
27.10.	2 -G		Replication, Repair, Recombination, Ch. 5	
1.11.	3		From DNA to protein, Ch. 6	
3.11.	4		Control of gene expression, Ch. 7	
8.11.	5	Part 2	Membrane structures, Ch. 10	<b>Assignment I (Essay) Draft I (8.11.)</b>
10.11.	6 -G		Membrane transport, Ch. 11	
15.11.	7		Intracellular compartments and protein sorting, Ch. 12	<b>Assignment II – Draft I (15.11.)</b>
17.11.	8		Membrane Traffic, Ch. 13	<i>+iGEM intro</i>
22.11.	9	Part 3	Cell signalling, Ch. 15	<b>Assignment II – Peer review (22.11.)</b>
24.11.	10 -G		Cell signalling, Ch. 15	<b>Assignment I (Essay) Draft II (24.11.)</b>
29.11.	11		Cell cycle, Ch. 17	
1.12.	12		Apoptosis, Ch. 18	<b>Assignment II – final version (1.12.)</b>
7.12.	EXAM		December 7th	
8.12.	Final version essay		December 8th	<b>Assignment I (Essay) Final version (8.12.)</b> Aim at finishing before exam date. Use last days for polishing.



# Examinations

- Examinations are scheduled for:
  - 07.12.2022, 14:00 to 18:00 Ke1
  - 19.02.2023, 09:00 to 13:00 Ke1
- Exam consists of problem-solving questions

# Home assignments

- Essay writing (in groups):
  - Goal: Connect the topics covered in the course into a bigger entity
    - Drafts and final versions need to be submitted
    - Writing should accompany the lectures and motivate to work with lecture materials and textbook
    - Total length 4000-5000 words (10-12 pages)
    - **Instructions given + made available at MyCourses after the 2nd lecture**
    - Assignment to groups before that, list will be posted in MyCourses (if late enrollments, may be updated till 30th)
- Analysis of a research paper (individually):
  - Goal: Learn to analyze scientific data and understand the approaches and methods that are used to create the data.
    - Two rounds of submissions + a peer-review
    - **Instructions given on the 3rd lecture (+available online afterwards)**



# Assignments - deadlines

- Overall, there are 6 deadlines for submitting the assignments:
- Assignment I, Essay:
  - Draft I, November 8th, 23:00
  - Draft II, November 24th, 23:00
  - Final version, December 8th, 23:00
- Assignment II, Research paper:
  - Draft I, November 12th, 23:00
  - Peer-review, November 22nd, 23:00
  - Draft II, December 1st, 23:00

# Using AI tools for assignments

- You can utilize to polish the language, as a dictionary etc.. But do not write the essay or any other text with ChatGPT.
- First of all, you will not learn anything, if doing that.
- Second, the quality is not high in scientific texts – part of the text produced may be completely nonsense.
- Aalto guidelines:  
<https://www.aalto.fi/en/services/guidance-for-the-use-of-artificial-intelligence-in-teaching-and-learning-at-aalto-university>

# Questions, comments?