

Molecular and Cellular Biology

Course No: **BIO3035**

Credits: **3.00**

Wednesday: **13:00pm – 14:30pm; Ro-# H305–208 (ITBT)**

Thursday: **14:30pm – 16:00pm; Ro-# H305–208 (ITBT)**

- Real-time live online lectures via HYU Blackboard system

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3

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Online access to lecture notes via:

----> <http://itbe.hanyang.ac.kr>

-----> go to Teaching -----> Autumn / Fall Term – Klaus Heese
-----> Undergraduate -----> Cell Mol Biol BIO3035

This file will be re-uploaded next week after closing of course registration. Because the student excel sheet No may change.

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4

Name: Prof. Dr. HEESE, Klaus (Germany)
Office: Graduate School of Biomedical Science & Engineering,
FTC, 12th floor, Room-No: 1209-15
Teaching: General Biology, Cellular and Molecular Biology,
Biochemistry,
Research: Neuroimmunology
Office hours: Consultation: upon request via e-mail-
appointment and/or after class
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Web: <http://itbe.hanyang.ac.kr>

5

BIO3035 Molecular and Cellular Biology

Structure of Course:

Lectures: about 9 subtopics over 16 weeks

Homework Assignment: Individual Homework plus Oral Presentation

Oral Presentation: about your homework, instead of Mid-Term exam

Quiz: at the end of the semester - for exam preparation & active attendance!!

Q & As: at the end of the semester - for exam preparation

Exam: (written)

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6

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Evaluation methods:

Scoring system: absolute grading

A+ : 95 – 100 %
A : 90 – 94 %
B+ : 85 – 89 %
B : 80 – 84 %
C+ : 75 – 79 %
C : 70 – 74 %
D+ : 65 – 69 %
D : 60 – 64 %
F : < 60

- 1) 10 % regular attendance
- 2) 15 % pro-active attendance during class (debate) (including Quiz and Q & A as for extra points)
- 3) 45 % Individual home work + English Oral Presentation (submission of presentation as print and ppt-file; topic to be decided later)
- 4) 30 % exam (written)

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7

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Recommended **textbook:**

Text book: Molecular Biology of The Cell, 4th edition, 2002
(also online at 'NCBI')
Authors: Bruce Alberts, Alexander Johnson, Julian Lewis,
Martin Raff, Keith Roberts, and Peter Walter.
Paperback: 1616 pages
Publisher: New York: Garland Science;
Language: English
ISBN: ISBN-10: 0815340729; ISBN-13: 978-0815340720

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8

Below are some basic text books which you may check later if any book is of interest for you e.g. during/after year 3.

Cell Biology text books

Text book: Molecular Biology of The Cell, (also online at 'NCBI')
Authors: Bruce Alberts, et al.

Text Book: Molecular Cell Biology, (also online at 'NCBI')
Authors: Lodish et al.

Text book: Campbell Biology
Authors: Jane B. Reece, et al.

Biochemistry text books

Text Book: Biochemistry
Authors: L. Stryer

Text Book: Biochemistry
Authors: D. Voet and J. Voet

Neuroscience text books

Text Book: Principles of neural science
Authors: Eric R. Kandel, James H. Schwartz, Thomas M. Jessell.

Text Book: Fundamental Neuroscience
Authors: Larry R. Squire, Fundamental Neuroscience.

Text Book: Neuroscience
Authors: Dale Purves.

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9

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Syllabus: ~ 7 subtopics, key words

1. General Introduction to the cell
2. Biomolecules, amino acids and proteins, 1 & 2
3. RNA, DNA, Chromosomes, Genomes (including basic control of gene expression etc; including applied molecular and cellular technologies), 1 & 2
4. Proteins and Enzymes (including structure, function, purification etc; including applied technologies), 1, 2 & 3
5. Cell Biomembrane
6. Cell Signalling, (basic signalling pathways I-IV, cell cycle, apoptosis, cancer, pain, neuroimmunology, brain cells & signalling, vision, pain) 1-8
7. Practical biomedical molecular and cellular engineering applications (including methods such as manipulating mammalian cell functions), 1 & 2

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10

BIO3035 Molecular and Cellular Biology

Syllabus: ~ subtopics by lecture notes provided during the semester:

1. General Introduction to the Cell
2. Bio-Chemical Foundations & Key Molecules of a Cell : Biomolecules, amino acids, proteins, RNA, DNA
3. The Cell – From Genes to Proteins: key processes
4. Proteins: Proteins: Structure and Function
5. Basic Molecular Genetic Techniques; Visualizing, Fractionating, Isolation of Cells, Gene Sequencing, Chemical DNA Synthesis
6. Cell Bio-Cell-membrane: Structure and Function
7. Brain Cells
8. Cell Energy (ATP, glucose metabolism)
9. Cell Signalling, - G-protein signalling, Receptor Kinases, Neurotransmitters & Receptors, Neuro-Immune-signalling
10. Plants, Photosynthesis, etc
11. Optional: Molecular and Cellular Signalling in Vision
12. Optional: Molecular and Cellular Signalling in Pain
13. Practical biomedical engineering applications: homework

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11

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Goals:

1. Getting an excellent Grade ☺
2. Getting to know the fundamental knowledge about the cellular bio-molecules, their basic structure and functions in a cell
3. Getting insight into the basic cellular signal transduction pathways, metabolic processes of proteins and genes in a cell
4. Understanding the basic molecular and cellular technologies and the potential biomedical applications of molecular and cell biology.
5. Practical biomed. engineering applications – Homework: Getting an opportunity to familiarize yourself with cellular and molecular biology, a key component of Biomedical Engineering, and getting first experience to convey such acquired expertise to other scientists (classmates) outside such fields.

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12

Understanding and following the instructions
on the next slides is the key in order to be
able to secure a B or A.

Individual Homework / English Oral Presentation

Please prepare 2 students per 1 group !

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13

45 % Individual Homework / English Oral Presentation

(submission of presentation as ppt-file and printed version!)
(instead of midterm exam); please prepare 2 students per 1 group !
(each student submits a ppt file (plus a printed file !!!))

Topic: Biology, Life, Cell, Molecule, Bio-Med-Engineering,
Application of your selected topic in e.g. medicine.

Prepare also at the end a final 1 summary slide with 1 figure/illustration that tells about a link between your oral presentation (containing about 10 slides) and a bio (medical) engineering application such as: BioMaterial, Bio Tissue Engineering, Biomedical technology devices, Bio-Energy, ..., Bio-Food, Bio-Cosmetics, ...; Write at home for yourself 1 page (figure plus text) what is described in this 1 slide. You do not need to submit this 1 page to me - but it is important for you to do it.

Final File-name: e.g.: No-8-ID-20170123456-Jxxx Yzzz KYY.pptx

slides: ~ 10; on top of first slide: **on top of the slide/page-1: e.g.**

No 8: Jxxx Yzzz KYY, **ID:** 20170123456; **email:** kyy1234@gmail.com

Project Title:

Time: ~ 10 - 15 min. (incl. discussion / Q & A)

Date: end of semester, before exam

Language: English – but not evaluated !

Important: to do it (experience) !!

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14

Individual Homework / English Oral Presentation

Slide-1

BIO3035 Molecular and Cellular Biology

No 8: Jxxx Yzzz KYY, ID: 20170123456; email: kyy1234@gmail.com

(please write here below also your group partner:

e.g.: No 11: Aaaa Bbbb CCC, ID: 201707891011; email: abc1234@gmail.com

Project Title: ...

Summary Abstract: ~ 100 words, +/- 1 figure

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15

Individual Homework / English Oral Presentation

Slide-1 group partner

BIO3035 Molecular and Cellular Biology

No 11: Aaaa Bbbb CCC, ID: 201707891011; email: abc1234@gmail.com

(please write here below also your group partner:

e.g.: No 8: Jxxx Yzzz KYY, ID: 20170123456; email: kyy1234@gmail.com

Project Title: ...

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16

Online access to lecture notes via:

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17

Lecture notes are ready for download about 12 – 24 hours before the next lecture.

----> <http://itbe.hanyang.ac.kr>

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18

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Tentative schedule: ----> <http://itbe.hanyang.ac.kr>

(may slightly change, depending on lecture progress)

Oct 19 – 23: mid term exam week: normal real-time live lectures;

Oct 26 – 30: time for home-work: normal real-time live lectures;

Oct 30: ppt-file of oral presentation submission to: Ms Solpa LEE: solpalee@naver.com

Oct 30 - Nov 02: Ms Solpa LEE submits all ppt files in 1 email to Prof Klaus Heese;

Nov 04: ~~A, B, C, C, C~~ submits all ~~printed~~ documents in order (No of excel file) to Prof. (online teaching -- no offline presentation, printed files not required)

Dec 09, 10, 16, & 17 (Wed/Thu): 13:00 – 14:30 / 14:30 – 16:00;

oral presentations (~ 6 persons/groups per day/ session, depending on progress);

Dec 23 (Wed): 13:00 – 14:30 : Quiz, Qs & As (pro-active attendance!!)
(1 ½ h; Ro-# H305–208 (ITBT));

Dec 24 (Thu): 14:30 – 16:00 : Exam (1 ½ h; Ro-# H305–208 (ITBT));

oral presentation: e.g.:

Slide-1 page: on top of the page

No 8: Jxxx Yzzz KYY, ID: 20170123456; email: kyy1234@gmail.com

Project Title:

Summary Abstract: ~ 100 words, +/- 1 figure

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20

출석부									
과목명	세공분자생물학	학수번호	B10035	수강인원	1500	학생	성	성	성
담당교수명	Klaus Heese (인)			실용평가기준	SRAS (회고인정중)	—	KLW (회고인정중)	—	
일	월	일	시간	이름	출석	비고	1	2	3
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21

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22