

3-year course evaluation

Course: MOL210

Name used up until 2022: **Lipid Biochemistry: From Chemistry to Diseases**

Name change in 2023 to: **LIPIDS: molecular, cellular and biochemical properties in health and diseases**

Semester and year for completed course evaluation: Autumn 2023

Name of course coordinator(s): Aurélia E. Lewis

Guest lecturer: Øyvind Halskau

Describe and justify pedagogical choices in the course, reflect on the students' learning as a result of these choices.

Course description

This [course](#) was developed by Aurélia E. Lewis (AEL) with the help of Øyvind Halskau (ØH) and started in 2012 (autumn semester). It has run every year except in 2016 when AEL was on sabbatical. It is followed by bachelor and master students from UiB from our molecular biology program, as well as from other program from UiB or from abroad (biology, pharmacy, human nutrition, microbiology, chemistry, biotechnology...).

Course objective and content:

The course aims to deepen the knowledge acquired in basic lipid biochemistry covered in MOL100 and MOL200, and to further understand the properties of lipids at the chemical, molecular and biological levels that contribute to cellular function in health and diseases.

The course covers the following main areas: properties and function of membrane and intracellular lipids, the biochemical and biological significance of lipid-protein interactions, advanced lipid methodology and lipid-related diseases.

Learning Outcomes

On completion of the course the student should have the following learning outcomes defined in terms of knowledge, skills and general competence:

Knowledge

The student

- can explain phospholipid biosynthetic and catabolic pathways
- can explain methods of lipid analysis
- can describe and understand how lipid assemble into membranes and accommodate for trans-membrane proteins
- can explain lipid-protein interactions at membranes and their functions
- can describe lipid modification of proteins chemically and functionally
- can explain lipid-mediated signaling and its role in cellular processes
- can describe different lipid-mediated diseases at the molecular level

Skills

The student

- is able to apply new knowledge and principles to understand molecular mechanisms of normal cellular processes and lipid-related diseases
- to evaluate, summarize and refer to the scientific literature within the field of lipid biochemistry

General competence

The student can demonstrate advanced knowledge in lipid biochemistry and is able to apply it in a wider biochemical and biological context and in line with current research.

Course structure

The course consists of:

- 1 course info meeting, 11 lectures and 1 question time (spørretime, Q&A), 3 tutorials and 2 workshops on info on the semester assignment info, each lasting 2x 45 min. None are mandatory except for the course info meeting. **All were given in person in class by AEL except for 2 lectures given by Ø Halskau.**

In 2023, 2x Q&A with 1 week apart were provided which allowed division of the course in two, to allow for more efficient revisions time.

- 1 obligatory **written semester assignment** but not graded, which aims to connect the course content to actual research in this field. The assignment follows a template which first focus on aspects of the course and then include a summary of a research article according to a set of guidelines. The summary was evaluated and deemed approved or not. If not, feedback was given with specific changes to be made for further approval prior to the written exam.

- 1 **written exam** (4 h), graded A-F, 100%

- **Quizzes** were provided on mitt uib (not obligatory) on the majority of the lectures to test the acquisition of knowledge from the lectures.

- **Weekly page** summarising the different activities were provided in **modules** on mitt uib, including links to lecture videos recorded in 2020, to guide the students through the course.

- **Textbook:** there are no textbook that covers all aspects of the course and we hence used to offer 2 of them: Membrane structural biology 2nd edition (Cambridge University press), and Lipids, Biochemistry Biotechnology and Health 6th edition (Blackwell publishing). This was not popular particularly from a cost perspective. **From 2021**, only the 2nd textbook was kept considering that most of the content is relevant, while 2 chapters from the 1st one were digitalised and provided on mitt uib and as pdf.

Results

In the last **3 years**, **71** students took the exam and 4.2% failed, an increase of 1% compared to the whole period when this course has run (**Table 1**). The grade distribution has been relatively stable but still showed an increase in the % of As in the last 3 years, reflected by a decrease in the % of Es in particular (Table 1, Figure 1). Overall, a small increase in the average grade, of 3.6 was obtained (Table 1).

Table 1: Total number of students taking exams in autumn and spring semesters 2020-2023

Conversion of letter grade to number: (A=5, B=4, C=3, D=2 and E=1)

year	# students	A	B	C	D	E	F (fail %)	Average grade
2021	27	6	11	4	2	1	3	
2022	24	7	6	5	4	2		
2023	20	6	3	6	5			
TOTAL 2021-23	71	19	20	15	11	3	3 (4.2%)	3.6
%		26,8	28,2	21,1	15,5	4,2	4,2	
TOTAL 2012-2023	187	38	57	43	30	13	6 (3.2%)	3.4
%		20,3	30,5	23	16	7	3,2	

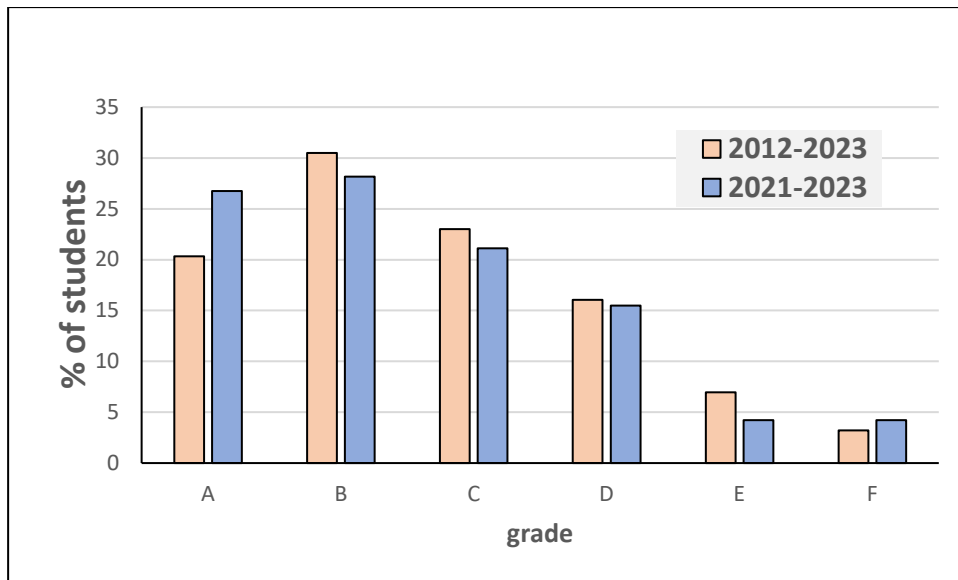


Figure 1. Grade distribution comparison between the last 3 years to the last 11 years

Follow-up of previous evaluations.

The course has overall been assessed positively by students over the years, for ex, very good (20%) or good (80%) in 2020. Some changes were still implemented to increase learning quality for students. Since 2020, quizzes have been provided to the majority of lectures. A few more short practice questions were also made in line with the lecture content. Since 2020, lecture videos have been provided as well as in person lectures, which were considered as useful. Some students expected more disease content in the course. A few more links to diseases in lipid biochemical pathways were added in 2021.

The semester assignment used to consist of 2 parts: an oral presentation and a written summary on a chosen or given research article. The presentations were often not well attended by other (not presenting) students. From 2021, only the written assignment remained.

Student evaluation and other evaluations that are relevant to the course.

Student surveys were collected from 2021, 2022 and 2023 and in total 28 students responded (39%). Here is a summary of how they answered about the following topics:

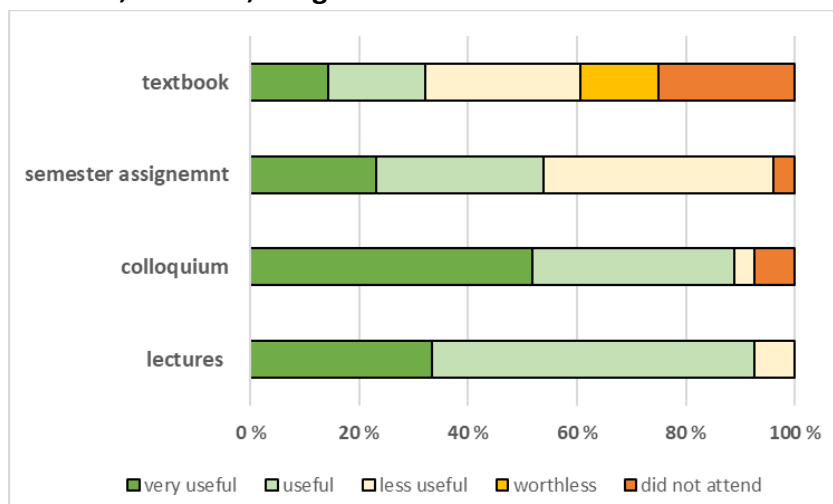
Overall course quality: very good (36%), good (46%) or just fine (18%)

Expectations students answered yes or to a certain extent in 82%. 11% (3 respondents) did not think that the course corresponded to their expectations. These were from the survey of 2022 and it was mentioned that more content on diseases were expected. This was evaluated and answered in the last own evaluation, as follows: *“However, 3 lectures are fully dedicated to diseases and some diseases aspects are also integrated into additional lectures. This is a course in molecular biology and the molecular and biochemical details are necessary to understand the potential link to disease occurrence and development. This is noted and will be better explained. The title of the course may be changed I guess: LIPIDS: molecular, cellular and biochemical aspects in health and diseases”*

Work load: just right (86%), too little (7%), too much (7%)

Exam: OK (79%), easy (14%), difficult (7%)

Lectures, tutorials, assignment and textbook:



Experiences from others who contribute to the teaching of the course, both students and staff.

No particular comment from our guest lecturer.

The percentage of failure in the course.

2018-2020: 4.65%

2021-2023: 4.22%

Assessment of correspondence between the course's learning outcome description and teaching, learning and assessment methods.

The lectures, quizzes and short practice questions cover the course's learning outcome description. The exam tend to cover the majority of the course content.

Course expectations: the course corresponds to the students expectations in 82% of cases (2021-2023) and 100% in 2023.

Course description match: 100% (yes or to a certain extend)

Exam: 1 student mentioned in 2023: *“Very happy with the exam. Tested the main themes covered in the lectures. Still a few challenging question, making the exam not too easy or too difficult. Plenty of time to finish the exam as well.”*

Assessment of whether the progress and structure of the course is in accordance with the established goals for the course and program.

MOL210 is well aligned with other courses in the bachelor program in particular with MOL100 and MOL200, which cover introductory aspects of lipid biochemistry.

In those cases where there is associated practice or work relevance in the course, it must be evaluated whether the scheme works satisfactorily.

Not relevant