Course Evaluation 2018

**MOL300 Practical Biochemistry and Molecular Biology (20 ECTS)**

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MOL300 is a lab-based compulsory course taken by incoming molecular biology-majoring MSc students. The students are required to prepare and perform project-oriented experiments, and to write full reports after the topics.

The main goal of MOL300 is to equip the students with basic knowledge and practical experience in modern molecular biology and biochemistry. The course has two main areas of emphasis: hands-on experience and report writing. Tightly knitted lab schedules allow the students to perform as many experiments as possible. The students also receive intensive training on report-writing, with helps including detailed feedbacks on submitted reports.

The aims of MOL300 are: 1) to plan and conduct an experiment and to document its results, and 2) to learn how to communicate the outcome both orally and as written report. In all, the course aims that the students be well versed in both practical skills and scientific communication skills.

MOL300 gives a letter-based grade, which is consisted of a formal written exam (70%) and an overall report evaluation (30%). This bifurcated evaluation scheme was first used in MOL300 and is to date one of the most thorough and fair evaluation methods used in a traditional practical course. The scheme is now used in other practical courses in BIOMOL. The proportion of A and B grades in MOL300 lies about 50% (of which A being 10-20% and B 30-40%). In 2018, As and Bs were 26% each. There is clear relationship between the report grade and the exam grade: The students who did well in report writing do also well in the written exam.

13 out of 19 students completed their course evaluation in 2018. (Since they gave their evaluation after taking the written exam, the tone of the response was somewhat varied on specific points, presumably influenced by the perceived results.) Most students (over 90%) say the course is intense and demanding, but they also say that the time and efforts they have invested was worth much. This concurs with the past evaluations. Former MOL300 students still give positive impression of MOL300 well after obtaining their MSc, with the biggest benefit being MOL300's help toward their MSc studies.

There are four main points in the students' course evaluation.

1. Consistence in report grading

This is a perennial issue in MOL300 (and in other lab courses as well). Since we have many teachers, it is a daunting task to have one voice. (Everyone has own preference. Here we are talking about rather minor differences. No one disputes on big rules.) The students want only one way/rule to follow, with NO exceptions. But this is not only impossible, but also undesirable. For the former, unless we have only one teacher throughout the semester, this is not attainable. To ameliorate students' concern and frustration, the grading criteria are straightened out and made clear. Furthermore, the course-in-charge reviews the grading results of each report to see if there is an 'unusual' aspect. For the latter, each topic/project require a (slightly) different emphasis on report format and content. This is evident on the existence of various scientific journals after the disciplines/subjects. MOL300 has a special

session on report writing and each topic/project ends with a Q&A session about report writing of the topic/project concerned. Further efforts will be made to clarify the rules.

## 2. New methodologies

Fuelled by rapid development of technology and instrumentation, methods and techniques in modern biochemistry and molecular biology are changing rapidly. Although some 'old' methods are still used widely, many have become already obsolete just after a few years in use. Therefore, it is both exciting and challenging for the experimentalists to keep updated with new methodologies. In MOL300, we try hard to 'be current', but some obvious challenges remain. One is the shortage of competent personnel (due to ever more sophisticated methods) and the other is the lack of state-of-the-art instruments in the teaching lab (we would need several of these instruments if the students wanted direct hands-on experience). Furthermore, making (or significantly revising) a protocol requires much efforts. (Because the students usually get only one chance to perform an experiment, the protocol must work in THEIR hands.) Regardless, we have a plan and are working on updating/replacing of existing protocols.

## 3. Textbooks and required literatures

For syllabus, MOL300 has a textbook (Wilson and Walker: Principles and Techniques of BioChemistry and Molecular Biology). Because the textbook does not cover all information for the topics in MOL300 (neither every information in the textbook is actually dealt with in lab exercises), detailed lab protocols and lectures are used. (The relevant book chapters and sections are clearly mentioned in the lab protocols.) Specific topics are also covered in Q&A or symposium sessions.

## 4. Exam questions

In general, the exam questions in MOL300 prefer 'Why' to 'What'. One has to think when answer 'Why', which in turn requires to know 'What' first. The students are often asked to justify their answers. If the defence (i.e., the logic) is good/strong, one gets considerable points even if the answer is factually wrong.

An example is the question about PCR-based conventional cloning. Here, one has to design a primer pair for a fusion protein construct. To be able to answer the question, one has to know what are required in making a fusion protein (in framing is a must), what/how is base-hybridisation, annealing, polymersase activity, restriction enzyme digestion, ligation, compatible ends, etc. So, the question is rather simple, but it contains/requires much info, and as such the question is worth many points.

Because it is not easy to find a textbook that covers all subjects taught in MOL300 (see above Point 3), the exam questions are also based upon lab protocols as well as old exam questions. Every year, an old exam review session is held about a week before the written exam. For 2018, two such in depth review sessions were held on 3rd Dec. 2018 and 5th Feb. 2019.