

Continuing Education at LCSO

Motivation: At all level, continuing your education in the field of organic chemistry will be strongly encouraged at LCSO. Below you will find helpful information on the possibility for continuing education for all members of LCSO.

1 For All Members

All members will have the occasion to profit from the group meetings to improve their knowledge and communicate their results.

2 Internship and Semester Students

Main goal: First contact with cutting-edge research and technical skills

Internship students will work directly with a senior PhD student or postdoc on his project. The main goal for them is to master the techniques in the laboratory and to understand the scientific background of the project. With the help of their supervisor, the internship student will also learn to write a scientific report at the end of their project and have a short oral presentation at group meeting.

3 Master Students

Main goal: First work on a separate new scientific project, independence in technical skills

Master students will get for the first time a well-defined independent project, but they will still work under the close supervision of a senior PhD student or a postdoc. The student will deepen their knowledge on their sub-project and become technically more independent.

4 PhD Students

Main goal: Become an independent project leader in organic chemistry

4.1 Education in Research:

Research is naturally the most important part of the PhD. With my help and the one of other group members, PhD students will gradually become independent scientists and project leaders. During the process, they will enjoy increased freedom, but also responsibility. An important part of the process will be to read attentively the literature on the research topic.

One of the greatest joy and challenge in a PhD is to become the main driving force behind your project. In organic chemistry, the experience is at the center of the research: only the PhD performing the experiment has all the pieces of the puzzle to drive a project forward! I will of course help you as much as possible on the way towards independency. More information can be found on the file "How to become efficient in the laboratory?"

4.2 Theoretical Education

From the 12 credits asked by the doctoral school, the following lectures will be taken at least once, as they are particularly relevant to our field of research:

Master lectures:

- Asymmetric Catalysis for Fine Chemical Synthesis CH-435

Doctoral Courses:

- Efficient Synthetic Routes towards Bioactive Molecules CH 620/ Synergism between Art of Total Synthesis and High Level Strategic Design CH-622 (MOM)
- Frontier in Organic Synthesis CH-707/708/709 (literature talks)
- Modern Organic Chemistry, Highlights/Trends in the Field/Success Stories CH-640/641/642 (Seminars)

In addition, the following lectures are recommended:

Master lectures:

- Total Synthesis of Natural Products CH-438
- Structure and Reactivity CH-432
- Physical and Computational Organic Chemistry CH-431
- Sustainable Chemistry and Engineering in Industry CH-407

Doctoral Courses:

- Medicinal Chemistry: Concepts and Case Studies from the Pharmaceutical Industry (CH-604)

The credits can be also obtained from other courses or summer schools, after a short discussion with me. In particular, lectures in chemical biology are recommended if our project is related to biomolecules, and lectures in artificial intelligences if your project is related to data. For the theoretical education, there are of course no reasons to stick to the minimum: if other lectures can be enriching for the education, PhD students are welcome to follow them.

Other important activities during a PhD:

- 2 literature talks (big talks) (one during the lecture, one in group meeting with 50% of the time spend on a research proposal)
- 2 active participations to MOM as a leader

4.3 Teaching

Each PhD student needs to do the 580 h required by the section of chemistry. Semester and master project for students registered in an EPFL official course or project counts for 56 h of teaching.

Teaching is a great occasion to deepen fundamental knowledge in chemistry! To ensure exposure to different style of teaching, each PhD student should aim to the following:

- Two Laboratory teaching in Chimie Préparative/ Chimie Organique TP (about 200 h)
- Two teaching assistances for lecture (about 20-50 h, main assistant can be much more (150-200 h)), ideally one in the first year lecture Chimie générale avancée, the other one in a more advanced lecture.
- Several supervisions of semester or master project (>112 h)

The rest of the teaching hours can then be taken according to the personal taste of the student with my approval.

4.4 Conferences

- As soon as enough results are obtained, participation to national and international conferences is strongly encouraged: it is an exciting and important part of being a scientist. With only rare exception, participation is supported only if a poster or an oral presentation is given.
- One international conference a year and meetings in Switzerland will be reimbursed by the laboratory. One conference during the PhD can be oversea. If extra funding can be obtained, other conferences can eventually be considered.
- Participation to a summer school is also possible without results to present and is particularly encourage in first year. Participating to an international conference and a summer school is possible only if it does not induce a too high working load for the student.

4.6 Specific helpful information for Junior (First Year) PhD

Main goal: Learn to move from “supervised researcher” to “main project responsible”

The first year of a PhD is highly challenging, as it constitutes a completely new step in your scientific career. Learning to juggle between research, teaching and continuing its education is a challenge for everybody! Here are a few useful hints and information to make your life easier:

- One main goal of the first year is to establish a good personal balance, so that you feel comfortable for your all PhD (work/life, body/brain/soul) balance. Be aware that you cannot solve all goals of your PhD in the first three month and don't overwork yourself.
- The first year is ended by the qualifying exam to enter definitively the doctoral school. The exam consists in a written report and an oral presentation. The criteria evaluated are in order of decreasing importance: 1) Quality of research done in first year, 2) Theoretical knowledge in organic chemistry 3) Formal quality of report and presentation. Everything will be done at LCSO to help you pass the exam. More information is given in the specific file First Year Exam and Beyond.
- The doctoral school requires 4 lecture credits in the first year from a total of 12 for the PhD. I would suggest not taking more than 6 in the first year however, to avoid a work overload.
- To avoid a work overload in the first year, it is also important not to teach too much (<200 h)
- The first year report is often a major challenge for young students. To avoid an “impossible job” at the end of the first year, a first report will be already done at LCSO after 6 months.
- In order to be able to focus on bringing your project on tract, supervision of students in the laboratory will not be required from you.
- During the first year in particular, you should profit as much as possible of feedbacks from me and senior member of the groups. All the team will be there to help you.

4.7 Specific helpful information for Senior PhD students (after first year exam)

Main goal: Fully realize your potential as an independent project leader

The years two and three of the PhD are usually the most enjoyable, as you are now more experienced and have been definitively accepted in the doctoral school. The fourth year is again more stressful, with the redaction of the PhD and the preparation of the next step in your career. Here are a few hints about what to expect on this stage of your PhD

- Complete your credits and teaching duties
- Become the true leader of your project. You can now propose new directions for your project.
- Acquire a first hand-on experience on personal leadership by supervising internship and master students and/or apprentices
- Participate orally and with posters to international conferences
- Participate actively to the education of Junior PhD student by helping them on the theoretical and experimental level
- Full writing of scientific publications
- Yearly reports, which will help you greatly for a smooth writing of your PhD thesis

5 Postdoctoral Fellows

Main goal: Broaden your experience and become a group leader

Obviously, postdoctoral fellows will have the largest freedom of all group members, but this freedom goes with increased responsibility. Here are a few hints of what you can expect at LCSO.

- Active participation to the mentoring of young PhD and master students
- One literature talk with research proposal each year
- Participation to international conferences
- Propose new research directions for the group
- Co-managing of the group, taking responsibility especially when I am away, leading of sub-group meetings, co-administration of the group meetings
- Independent writing of publications, participation to Grant applications writing
- Participation to the reviewing of manuscripts