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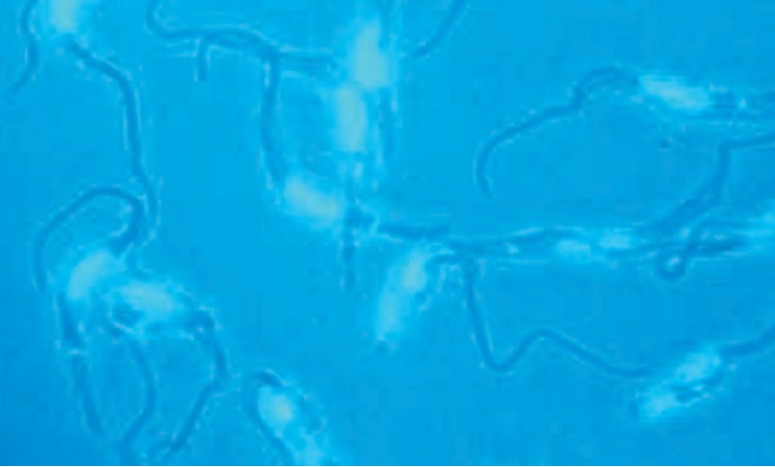
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**UNIVERSITÄT  
BERN**

## Master of Science in MOLECULAR LIFE SCIENCES (90 ECTS)

- Institute of Cell Biology (ICB)
- Institute of Plant Sciences (IPS)
- Department of Chemistry and Biochemistry (DCB)
- Research groups of the Medical and Vetsuisse Faculties





## Molecular Life Sciences

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The term Molecular Life Sciences stands for one of the most exciting and fastest moving research areas of the present. Traditional scientific disciplines such as biochemistry, cell and molecular biology, genetics, developmental biology, physiology, microbiology and immunology have effectively merged into a large field of overlapping specializations. Huge progress is being made in the elucidation of genomes, transcriptomes, proteomes and regulatory networks. The field holds promises for fundamental biological and biochemical research as well as for medical and biotechnological applications. Moreover, other important research areas such as ecology, conservation biology or climate research may also benefit from its progress.

A key feature of the Master Program in Molecular Life Sciences is its interdisciplinary aspect: it combines a wealth of teaching and research activities of the three participating institutions of the Science Faculty with important contributions from numerous research groups of the Medical and Veterinary Faculties. A particular emphasis of the program is the active involvement of students in research projects during their master thesis in one of the participating laboratories. Research is intense in the areas of host-pathogen-interactions / molecular parasitology, RNA biology, membrane biochemistry, development and inflammation, but many other topics are also being investigated. Thus the students get the opportunity to deepen and specialize their knowledge and skills in the area of molecular life sciences that they have previously acquired during their bachelor studies. All master courses are taught in English to facilitate the participation of international students and to provide an optimal initiation to the world of scientific literature and research.

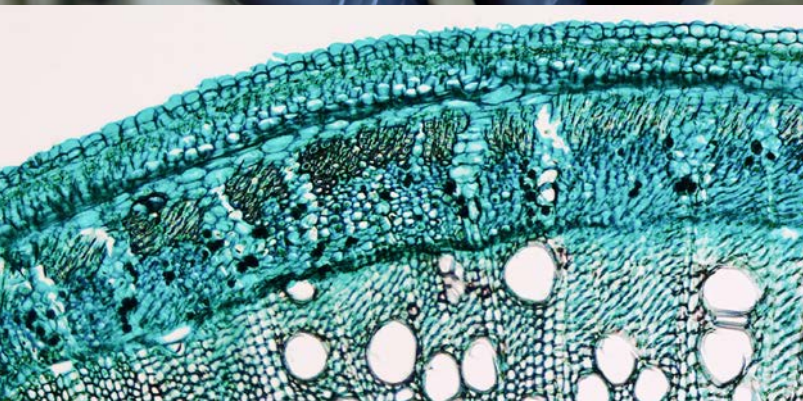
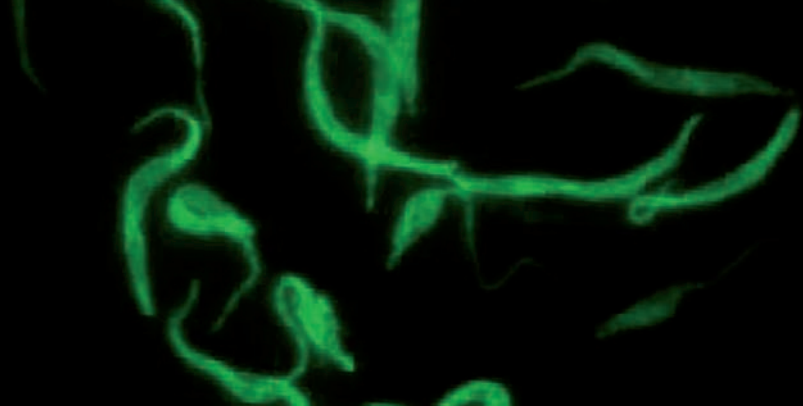
## Studying in Bern

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The University of Bern has a reputation for its prime quality of teaching and research while simultaneously offering a delightful setting and a campus environment intimately linked to the social, economic and political life of the city. With over 17,000 students, it maintains a warm and friendly atmosphere. Its academic and research organisation takes pride in its interdisciplinarity and offers students all advantages of a full university with excellent possibilities to establish their own networks.

The university is actively involved in a wide range of European and worldwide research projects. With its central geographic location and attractive programs, it draws students from all Swiss language communities and from abroad.

Bern is listed among the cities with the best quality of life in the world: the people are welcoming and friendly, the old town of Bern - nestled in a breath-taking setting surrounded by the Swiss Alps - is listed as a UNESCO world heritage site. The Swiss capital also has an outstanding range of cultural activities. Rents remain very affordable and there is a vast choice of accommodation. Bern boasts plenty of green areas in which to relax, numerous sports facilities and a broad selection of international culinary venues. And last, but not least, there is nothing more refreshing than a summer dip in the Aare river...



## Target audience

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This program is primarily intended for students holding a bachelor degree in Biology, Biochemistry or Chemistry. However, students from other types of curricula may also be admitted, based on an evaluation of their previous studies.

International students are welcome. Approximately 20% of the students entering the program have completed their previous studies at institutions abroad. Each year, the University of Bern offers a limited number of excellence grants for international master students.

The gender distribution is very balanced with 51% female and 49% male students.

## Curriculum

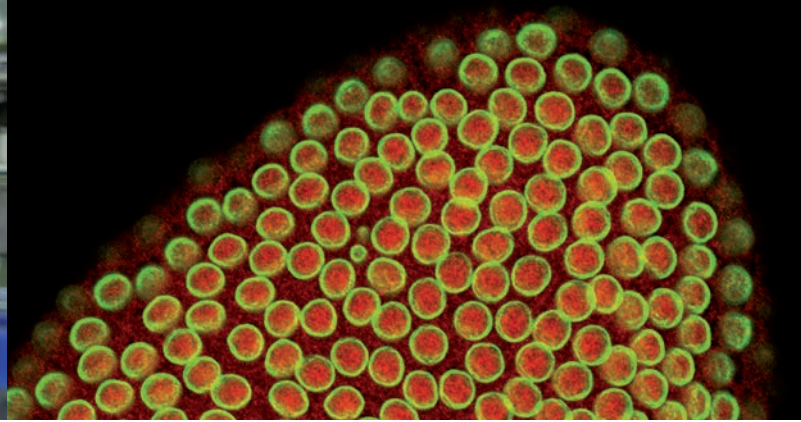
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Studies in the master program amount to 90 ECTS credits, one ECTS corresponding to 25-30 hours of student input. Full time students can complete the program in 3 semesters. It consists of:

- At least 15 ECTS in formal courses in the selected specialization area.
- The complement of the above to at least 30 ECTS in formal courses from the entire field of molecular life sciences. Some of these courses may be taken from the bachelor programs in Biology, Biochemistry or Chemistry or may be acquired at outside institutions.
- 60 ECTS in the form of an individual research thesis conducted in an affiliated research group (master thesis, including participation in research seminars).

The master program offers specializations in the the fields of Biochemistry / Chemical Biology, Cell and Molecular Biology, Microbiology / Immunology, Plant Physiology and Neuro- and Developmental Biology (the latter as joint venture with the University of Fribourg).

Students whose previous education does not provide a sufficient basis for the selected specialization may be required to take additional courses from the bachelor programs in Biology, Biochemistry or Chemistry.



## Participating Institutions

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The five specializations of the Master program are offered by three institutions belonging to the Faculty of Science and numerous research groups in the Medical and Vetsuisse Faculties.

### **Institute of Cell Biology (ICB)**

The Institute of Cell Biology is located in the midst of the other participating institutions. It neighbors the Bioscience library and the Institutes of Ecology & Evolution and Anatomy.

The ICB's 7 groups research using a broad range of experimental systems, including yeasts, ciliates, the parasitic protozoa *Trypanosoma brucei* and related species, insects, mammalian cell cultures and laboratory rodents. Investigated topics cover different aspects of basic biology and biomedical sciences including molecular mechanisms of host-parasite interactions, RNA biology and development.

### **Department of Chemistry and Biochemistry (DCB)**

Research in the (more than 20) groups of the Department of Chemistry and Biochemistry is divided into two domains: (I) Molecular Bases of Biological Processes (II) Chemical Foundation of Novel Materials. Some of the main contributions to the MLS Master program come from the first of these domains and cover topics such as structural biochemistry, membrane proteins, organic synthesis, nucleic acid chemistry and RNA biology, medicinal chemistry and chemical analysis of enzyme function. A scientific analytics section comprises six groups that offer services in addition to conducting their own research.

The ICB and DCB jointly ensure the coordination and administration of the Master program in Molecular Life Sciences (MLS).

### **Institute of Plant Sciences (IPS)**

The Institute of Plant Sciences is located north of the Aare river in Bern's botanical garden. It comprises seven groups that aim to carry out top level research and innovative teaching in all areas of plant biology. The research of the groups working in the area of plant physiology (which participate in the Master program in Molecular Life Sciences) covers plant nutrition, plant genetics and development and molecular physiology.

### **Medical Faculty**

Several institutes and research groups of the Medical Faculty as well as the interfaculty Theodor Kocher Institute take an active part in teaching and research for the Master program in Molecular Life Sciences. The involved researchers stem from different fields such as Biochemistry and Molecular Medicine, Human Genetics, Immunology, Pathology and Infectiology. The Medical Faculty also harbors a central animal (rodent) housing facility as well as other costly infrastructures and equipment which are available to biomedical researchers of the entire university.

### **Vetsuisse Faculty**

The Vetsuisse Faculty participates in the Master program in Molecular Life Sciences with its paraclinical units of Pathology, Parasitology, Bacteriology and Virology.

## Admission

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The admission procedure is described in detail on the program website