ETH zürich

Department of Biology

The new study programme in Biology at ETH Zurich

D BIOL

Content

Biology at ETH Zurich: a basic science subject newly designed

Biology is the science of living organisms - from tiny bacteria to plants, animals and us humans. Anyone who already has a high school diploma or is on the way to obtain one has an idea of this subject, as well as the basic subjects of chemistry and physics that are indispensable for biology.

However, biology is not simply biology; the range of subdisciplines is enormous, and accordingly, the priorities that different universities set in their biology programme can vary considerably, depending on the areas of research at the respective university. It is therefore advisable for all prospective students to carefully compare the respective offers and their requirements.

The newly designed Bachelors degree in Biology that started at ETH in autumn 2020 is unique, even worldwide. It is based on the development of life - from the origin to the complexity of multicellular organisms. On the one hand, the curriculum takes into account the rapid changes that biology is constantly undergoing in research and makes optimal use of the expertise of Department of Biology members. The number of unanswered questions in biology is immense, and technical progress with innovative and improved analytical methods makes it possible to gain new insights. These developments not only advance research and establish new concepts, but they also continuously flow into teaching and keep the curriculum up to date.

The most modern technology is used in biology - students working at the transmission electron microscope.

What constitutes biology at ETH Zurich

Various departments of ETH Zurich are working on topics that relate to biology. In the Department of Biology, fundamental processes of life are researched with a focus on the molecular and cellular level. To this end, we study both unicellular bacteria and multicellular organisms. For example, we study the structure and function of biological macromolecules that build the cell as the elementary unit of life. At the next level of complexity, we are interested in the networks of interactions between those macromolecules that are responsible for cell development, cell division and the regulation of metabolism. Finally, we are working to uncover the interactions between cells that lead to the creation of organs and organisms, and to explore the molecular basis of interactions between organisms.

We are developing concepts to explain life on its different levels. For example, we are investigating the molecular causes of diseases such as cancer, diabetes or obesity and how microbiomes affect humans or plants. Experimental research provides the necessary insights that can contribute to the development of treatment of diseases.

Research in the Department of Biology covers central areas of modern biology. The continuous transfer from research to teaching ensures that students are educated at the most current level of knowledge and encounter the latest experimental methods and measurement techniques in practical training. This places high demands on the students, and also requires the expertise of department members who meet the challenge to recognize and pass on new developments and concepts in biology.

The aim of biology studies at ETH Zurich

The aim of the studies in biology is to provide students with the knowledge and practical skills they need to independently investigate aspects of the function of cells and organisms. However, they should not only be taught biological knowledge, but students should also be able to critically question and apply it. In addition, creativity is encouraged, social skills are strengthened and personal development is supported in order to equip students with the necessary competencies to work in research, industry and society.

The biology programme at ETH Zurich offers an innovative and broad-based education in biology with the basics in chemistry, physics and mathematics, which also includes the (sub)disciplines of bioinformatics, statistics and modelling. The study programme starts from the molecular foundations and follows the evolutionary path of life with increasing biological complexity. It sets a focus on how research on specific groups of organisms translates into general concepts. It provides students with an integrated experimental and theoretical education in essential areas of modern biology, which includes the handling of complex data sets. The goal is to optimally prepare students for future challenges in biology and for diverse careers in biologically or medically oriented disciplines.

After completing the studies in biology, graduates will be able to rely on a broad scientific education in their later professional life, which will enable them to work in a wide variety of fields. These include research (at universities, research institutes, biotechnology-oriented companies or the chemical-pharmaceutical industry) or in other industries such as marketing and sales, consulting, risk management or as high school teachers and in many other areas.

Questions that we will be asking ourselves in the first year of study:

- What is life and how may cells have evolved?
- What are the chemical molecules central to life?
- Which energy sources drive life processes and how?
- How do cells interact chemically and physically with their environment?
- How is information stored?
- How does a cell copy itself?
- How do living beings influence the environment and ultimately the entire earth?
- What is the basis of cellular complexity?
- How did eukaryotic cells evolve?
- Which processes are common to pro- and eukaryotic organisms, which are not?

Questions that we will be asking ourselves in the second year of study:

- Which steps lead to the development of cells as we know them from plants, fungi and animals?
- What are the opportunities and challenges of multicellular life?
- How did multicellular life emerge?
- How does a single cell develop into a multicellular organism with specialized functions of differentiated cells?
- How do cells in an organism coordinate and communicate?
- How has terrestrial life evolved and what are the prerequisites?
- What are the biological properties that enabled the development of the great diversity in plants and animals?
- How do organisms distinguish between self and non-self?
- What causes diseases and how can we lay the foundations for their cure?

Differences in the study programs offered in the Life Sciences at ETH Zurich

If you are interested in how nature works and are fascinated by biology and medicine, the choice of study is obvious: a natural science degree in the field of life sciences has the greatest appeal. ETH Zurich offers five structured courses of study in this field, which deal with scientific issues in the life sciences: **Biology, Pharmaceutical Sciences, Health Sciences and Technology, Human Medicine** and, in some areas, **Environmental Sciences**. These study programmes have many points of contact, but all have different orientations. Biology focuses on basic principles of life in all its forms.

The first half of the Bachelor programme in biology and pharmaceutical sciences has a large proportion of joint laboratory work placements and biologically oriented courses. Subsequently, however, the courses of study go their separate ways. In Health Sciences and Technology and Medicine, practical applications in medical fields are given significantly more weight. In the environmental sciences, the focus is on the interactions between humans and the animate and inanimate environment, and social sciences and the humanities are more strongly integrated.

In the third year of the Bachelor programme, the differences between the five fields of study become even clearer. In biology, students have the free choice of research internships, in which they participate in the current work in a laboratory and thus have the opportunity to get to know the research business from the inside at an early stage. These internships are offered by all professors of the department and can also be completed in other departments of ETH Zurich and in corresponding institutes of the University of Zurich. This results in a large and unique spectrum of opportunities. In contrast, in the pharmaceutical sciences, lectures and laboratory internships are predefined in the third year. The medical course is similar, with laboratory, research and professional internships. In Health Sciences and Technology, the third year is strongly interdisciplinary: Subjects from four main areas must be attended. There is a limited freedom of choice within these areas. The third year in the environmental sciences is structured in a similar way and is strongly system-oriented.

The Master programmes of the five fields of study are also structured differently. In biology, with its nine majors, two-thirds of the time is devoted to research practice, and one-third to theory. In the pharmaceutical sciences, two Master programmes are offered: one in Medicinal and Industrial Pharmaceutical Sciences, another in Pharmaceutical Sciences. In addition to theory and research practice, the Master programme in Pharmaceutical Sciences also includes a mandatory internship in a pharmacy. In the Health Sciences and Technology programme, students can choose from five different majors, two-thirds of which, as in biology, consist of (research) practice and one-third of theory. It is also possible to apply for certain majors of specialised Master programmes such as Biomedical Engineering. For the Master programme in Medicine, Bachelor students switch to partner universities such as the University of Zurich, Basel or the Università della Svizzera Italiana. The Master in Medicine differs from the other three in one essential feature: with three years, it lasts twice as long; the vast majority of students attend lectures and get work experience in equal parts, with only a small part reserved for research practice. The Master programme in Environmental Sciences lasts two years and includs professional practice, and it has six different majors, of which the one in Ecology and Evolution is closest to biology.

Details regarding these courses can be found here:

Health Sciences and Technology:
https://www.hest.ethz.ch/studium/gesundheitswissenschaften-technologie.html

Medicine:
https://www.hest.ethz.ch/studium/medizin.html

Pharmaceutical Sciences:
https://www.chab.ethz.ch/studium.html

Environmental Sciences:
https://usys.ethz.ch/studium.html

Online tool for the comparison of study programmes
https://www.ethz.ch/de/studium/bachelor/studienwahlberatung/studiengangvergleich.html

The languages in biology studies: from German to English

The international language in research is English. One of the goals of biology studies is to familiarize students with this language and its specific application in research while they successfully complete their studies.

The shift in the use of from German to English during the course of studies is triggered by the shift from an education that is initially mainly theory-based to more and more practice and participation in research. The more weight is given to research work in the course of the studies, the more English is spoken. So the transition does not happen overnight, and the necessary adjustment time is available. In the Master programme, for example, students are involved in research groups for two thirds of the time in the context of project work and a Master thesis. Here communication is almost exclusively in English. After completing their studies, students are therefore well equipped in terms of language skills - not only for research, but also for the international professional world in general.

Structure of the biology studies

The professional qualification for the biology degree at ETH Zurich is the Master degree. It can be obtained 4 ½ years after entry. In the first three years of study, a Bachelor degree in biology is obtained, which has a hinge function for the transition to one of the nine specialisations of the Master programme in biology. Alternatively, a Biology Bachelor offers the possibility to transfer to other Master programmes at ETH Zurich or to Master programmes at other Swiss and foreign universities.

Bachelor programme 6 semesters

1st and 2nd year of study: core subjects and fundamentals in natural sciences

3rd year of study: orientation year (free choice of block and concept courses)

Master programme 3 semesters

Research | Theorie

Doctoral studies 3 – 4 years, after completion of Master programme

The Bachelor programme in Biology

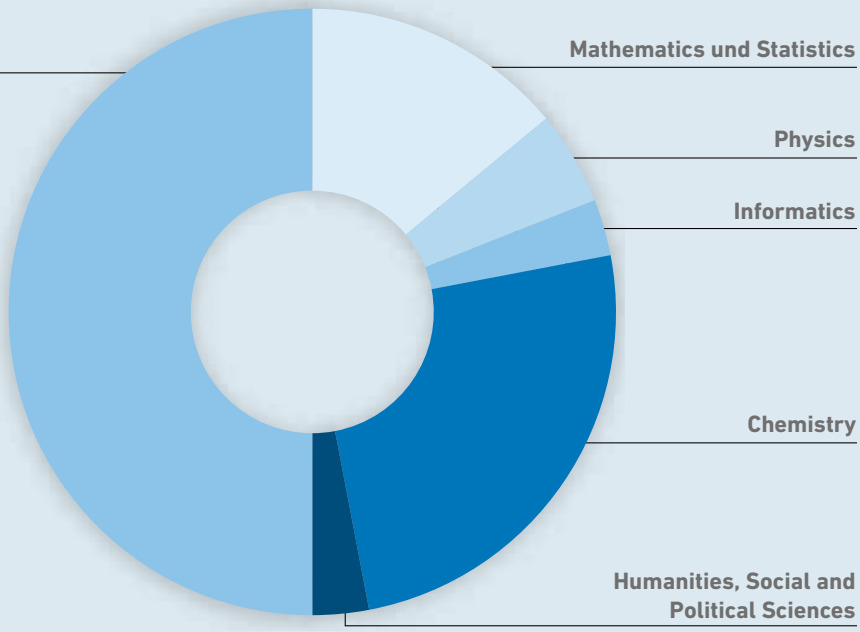
The first two years of study

The first two years of study in biology are uniform for all students and provide a common basis. An in-depth education in the basic scientific subjects forms the foundation for further studies in the higher semesters. Lectures in biology, mathematics, chemistry and physics are supplemented by exercises in which the acquired knowledge is applied. Great importance

Subject distribution in the first two years

Biology

- Fundamentals of Biology and Evolution
- Biochemistry and Molecular Biology
- Cell Biology
- Microbiology
- Immunology
- Plant biology
- Genetics / Genomics
- Bioinformatics
- Bioanalytics
- Systems Biology

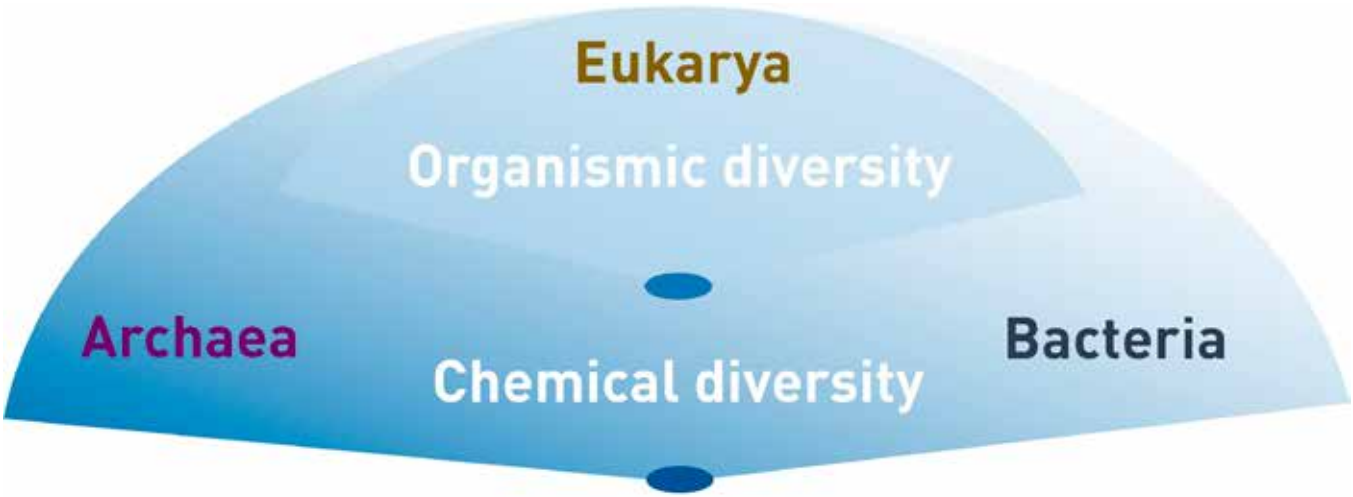


is given to practical training: In the first two years of study, two broadly diversified laboratory courses in chemistry and biology are offered. These coordinate with the lectures of the respective year, clarify teaching contents and convey the practical basic skills of experimental research. In addition, a practical course in bioinformatics is offered in the fourth semester, which is based on lectures and exercises in computer science and statistics.

The biology lectures initially focus on providing a basic understanding of how cells function. Students learn about processes of energy production in cells, become familiar with the building blocks of life, and encounter the role of regulation and evolution in the formation and coordination of biological processes and structures. The learning content starts with bacteria and archaea as the organisms with the longest life history on our planet and extends to the higher cellular complexity found in eukaryotes. Special emphasis is placed on teaching unifying concepts.

Internship in the first academic year: Students doing an experiment in a basic biological internship

The second year of biology studies provides an understanding of how eukaryotic cells differentiate and cooperate. The course contents include cellular interactions and properties that enable the formation of multicellular organisms - be it plants, fungi, animals or humans. Furthermore, the content includes mechanisms that organisms have developed to distinguish self from non-self and how diseases can develop. In addition, contents of biochemistry, genetics and evolution are deepened and an understanding of quantitative relationships is taught.



Unity and diversity of life. While bacteria and archaea show an impressive metabolic diversity, «higher organisms» (eukaryotes) show a remarkable organismic diversity and complexity.

Third year: Cooperation in research groups

The third year of study is a special feature of the biology bachelor programme at ETH Zurich. It offers a selection of advanced learning content and current research projects in a variety of subjects. After two years of lectures and laboratories with a fixed programme, students in the third year of study can follow individual interests, gain a first insight into research practice, get to know world-leading research teams and discover areas that they would like to deepen in their Master studies.

In this third year, a wide range of courses is available from which students can choose. Two types of courses are distinguished: block courses and concept courses. Students are free to choose the topics of the different courses. In this way, they are given a sound basis for their decisions, which should make it easier for students to choose an area of specialization within the Master. The third year is thus also designed as an orientation phase for the transition to one of the nine majors of the Master programme.

In addition to the natural science courses, students take additional courses of general educational content from the humanities, social and political sciences (GESS).

Discussion of the results in the microbiology block course «Molecular Defense Mechanisms of Fungi»

Block courses

ETH Zurich and the University of Zurich together offer more than 100 different block courses that can be taken by students and are mutually recognized by both universities. Each course is dedicated to a specific topic and teaches biological science as a process.

- Duration per course: 3 ½ weeks
- Time: from Tuesday noon to Friday evening
- Form: mainly practical work on a selected topic in the research groups, accompanied by seminars and literature work

In this way, students make important contributions to the progress of a project and gain a first insight into research topics and the working methods of the research groups. They choose at least five block courses.

Block courses cover all aspects of modern biology and related disciplines. Here are some examples:

- Parallels between tissue repair and cancer
- Analysis of the reactions of human B and T cells to infectious agents
- Phytopathology
- Calculation methods in genome and sequence analysis
- Molecular mechanisms of cell growth and polarity
- Visualization of bacterial cells using electron cryotomography
- Bioactive natural substances from bacteria
- Multigen expression in mammalian cells
- Epigenetic mechanisms in mental health
- Cause and consequences of unstable genomes
- Cell biology of plant-fungus interaction

Concept courses

Apart from a focus in laboratory practice and insights into research in the third year, theory must not be neglected either. To this end, biology students can choose from a total of 13 concept courses, of which at least three need to be taken. These courses convey - within the framework of lectures - in-depth knowledge of important areas of biology, chemistry and other related subjects. They take place in 2- or 4-hour sessions from Monday morning to Tuesday noon.

The following courses are available:

- Evolutionary Genetics
- Cell Biology

- Concepts in Modern Genetics
- Cellular Biochemistry
- Immunology
- Microbiology
- Introduction to Bioinformatics: Concepts and Applications
- Molecular Life of Plants
- Systems Biology
- Molecular and Structural Biology
- Nucleic Acids and Carbohydrates
- Proteins and Lipids
- Molecular Disease Mechanisms

In summary, the first two years of the Bachelor programme provide a broad scientific basis, while the third year is used for the individual orientation of the students and prepares them for the choice of the Master specialization.

«Thanks to the integration into a research group, one can personally contribute to important and current projects.»

Juliane, 3rd year Bachelor student

«The third year of my studies with its wide range of block courses was the main reason why I decided to study biology at ETH. In each of the 100 or so block courses offered, we as students have the opportunity to gain very intensive insights into a wide range of biological topics over a period of just under four weeks. Often you are integrated into a research group during the practical work and thus make your personal contribution to important and current projects. Thanks to the block courses, I was able to make many new contacts and get to know everyday life in the laboratory better. Only this experience made it clear to me where my interests lie and in which direction I want to specialise further.»

Gain experience abroad: exchange programmes

Some students would like to broaden their horizons beyond their home university, to get a taste of how things are done at universities in other countries. Students who wish to take advantage of this opportunity are advised to do so in their third Bachelor year or during their Master programme. Moving to a university abroad, a foreign language, finding your way around an unfamiliar culture, a differently organised teaching environment, different courses, living on campus and new fellow students are not only a formative and instructive experience for students, but also promote the development of personal skills and competences. To facilitate such exchanges, ETH Zurich maintains numerous agreements and programmes with European and non-European universities. These include the Swiss European Mobility Programme and the worldwide exchange programmes of ETH Zurich. Exchanges are organised in close cooperation between the ETH Rectorate and the Mobility Advisor for Biology, who bears the professional responsibility for mobility students. He is the contact person for the students and together with them ensures that the credits earned (ECTS) at the host university are recognised and that studies at ETH Zurich can be continued seamlessly after the stay at the host university. Exchange students remain enrolled as students at ETH Zurich during their stay abroad. The duration of studies is not prolonged through an exchange.

More information on this topic:

www.ethz.ch/de/die-eth-zuerich/organisation/abteilungen/akademische-dienste/mobilitaetsstelle.html

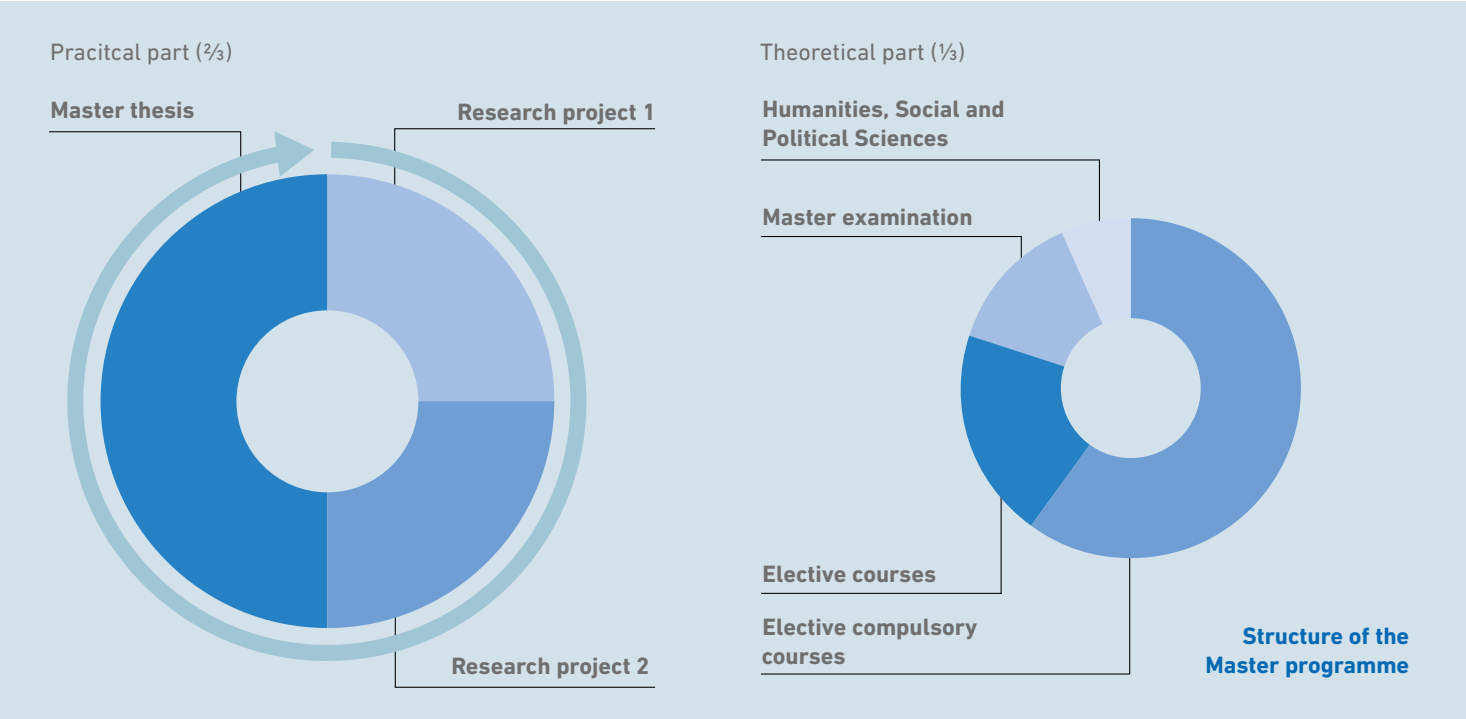
«Experience abroad broadens our horizons - academically, socially and culturally.»

Fernando, third year exchange to Imperial College, London

«The exchange programme at Imperial College London has allowed me to visit a renowned institution to experience up close and to assert myself internationally. Generally speaking, I was more flexible in my time management in order to prepare the various courseworks and presentations for the lectures / seminars. The university model at Imperial College showed me some differences in the teaching structure that I did not know before. On the one hand, this experience has helped me to appreciate what is practised at ETH, but on the other hand, I have also been able to identify where there is room for improvement. Apart from various opportunities to socialise in the student accommodation, you could join various clubs that are very popular - first and foremost the sports clubs. After all, the contacts you make abroad are probably the most valuable thing you can take with you. I am always welcome in London and I could well imagine applying for a PhD there. Experiences abroad broaden our horizons academically as well as socially and culturally. They give us a more differentiated view of our studies, our own university and what is possible in science».

The Master programme in Biology

In the Master programme, experimental research is at the center of the education. Two twelve-week research projects and the Master thesis (six months) are carried out in freely chosen research laboratories. In addition to this practical work, students attend specific concept courses and other lectures assigned to the individual majors. The specialisation in the Master programme is independent of the courses attended in the Bachelor programme. However, it is possible to focus the third year of the Bachelor programme already towards one of the majors of the Master programme.



The nine majors of the Master programme in Biology

The decision for a certain specialization made by Master students is not a decision for life. Their future career is therefore not restricted to a specific research area, but still leaves a great deal of freedom for their choice of career or a doctoral thesis. The topic of majors is very broad and ranges from ecology and evolution to biological chemistry. The topics covered in the various specializations may differ, but the methods used are often similar. A change to another field is still possible even after a successful Master degree and can be quite enriching.

The following specializations are available:

- Ecology and Evolution
- Microbiology and Immunology
- Cell Biology
- Molecular Health Sciences
- Biochemistry
- Plant Biology
- Systems Biology
- Molecular and Structural biology
- Biological Chemistry

«I hope that through my work I will be able to contribute to the further development of amphibian conservation.»

Roxane, Master major in Ecology and Evolution

«In the Master specialisation of Ecology and Evolution I have found the area of biology that suits me best and in which I can develop best. The block courses were extremely exciting and varied and have further enhanced my great enthusiasm for the incredible diversity of the plant, fungal and animal world. Furthermore, their structure and the implementation in small groups guaranteed efficient and sustainable learning. The two research projects were pointing the way forward to the Master thesis, which I finally decided on. For me, a great dream has thus come true: a mixture of laboratory and field work integrated in a large, nationwide project. I hope that with my work I will be able to contribute to the further development of amphibian conservation».

Field experiments are a central element in studies that investigate the adaptation of plants to different environmental conditions.

Master in Ecology and Evolution

Ecology and Evolution aim to understand the amazing diversity of life and how organisms interact with biotic and abiotic environments at all levels of biological organization from genes to ecosystems.

Evolution is key to understanding life on earth. Evolutionary processes shaped diverse lifeforms, with a bewildering variety of morphologies, life histories, physiologies and behaviours. Beyond explaining historical patterns, evolutionary analysis identifies forces driving evolutionary change and how populations adapt to different or changing conditions. Adaptations can be studied via experimental evolution, while theoretical models or computer simulations can generate predictions of future change. Evaluating how environmental changes affect ongoing evolution is critical considering the multiple current pressures due to climate change, diseases, invasive species or pests.

Ecology studies how microbial, fungal, plant and animal species interact with their environments and each other, and how interactions drive diversity. Beyond individual species, ecologists focus on interspecific interactions and how natural communities and ecosystems function. Deeper knowledge of ecology and evolution and how they interact is key to assess the impact of human society on natural systems, and how such systems can be managed sustainably.

This major allows students to become familiar with core themes of evolution, ecology, conservation and infectious diseases. Students are also exposed to cutting edge research in these fields, and have opportunities to apply theoretical or empirical approaches in the field, laboratory, experimental gardens or greenhouses. Molecular methods providing insights into the genetic basis of evolutionary change and ecological interactions synergize with ex-periments at organismal, population or community levels.

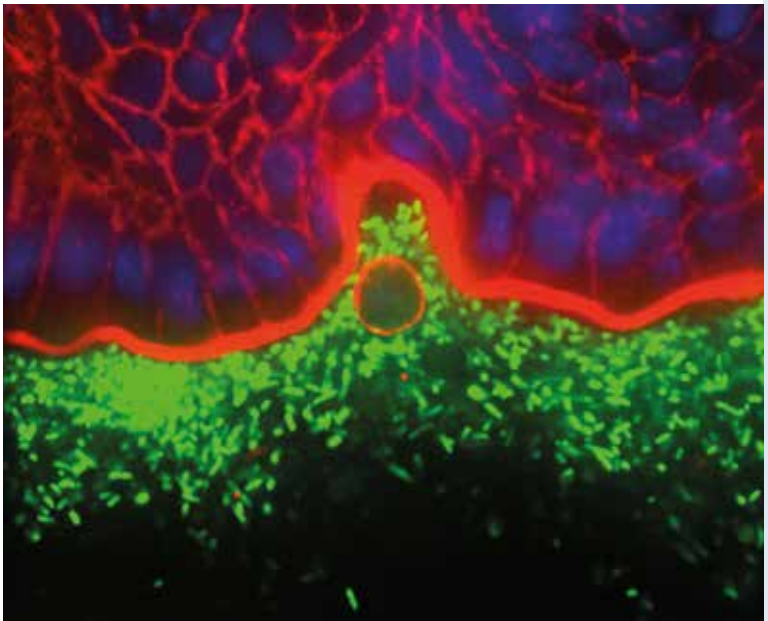
Master in Microbiology and Immunology

Microbiology and Immunology explore the interactions between different cells and how they shape communities in the environment or affect the health of animals or plants.

Microbiology focuses on microorganisms, a large and heterogeneous group of mostly microscopically small prokaryotic and eukaryotic organisms, i.e. bacteria and archaea, protozoa, algae and fungi, but also viruses. Microbes are the oldest life forms on earth and are characterized by a high metabolic diversity, which allows them to live in a wide variety of habitats. As pathogens, mutualists, and commensals, they are of central medical and ecological importance, and adapt to environmental changes or the hosts' immune defenses. Microorganisms also play a key role in a wide range of applications including food processing, drug discovery, synthetic biology, and diverse biotechnological processes, including the production of pharmaceuticals or fine chemicals.

Immunology studies how pathogenic microbes or defective cells are recognized and eliminated from a host organism - or how some non-pathogenic microbes establish a status of commensalism. Depending on the nature of the invading microbe or the cellular defect, the immune system has evolved diverse strategies to effectively recognize and eliminate or control such threats. Thus, successful immunological effector functions differ between bacterial, viral and fungal infections. In the context of mammals, the immune system has different strategies to distinguish between «self» and «foreign» and to recognize and fight «abnormal» self-cells such as malignant cells. Immunology plays a key role in a wide range of medical applications, such as vaccination and immune-based therapies.

Salmonella (green) infects the intestinal mucosa of a mouse.



«During my research project I was able to gain a good insight into the individual research groups and deal with the respective problems.»

Karina, Master major in Microbiology

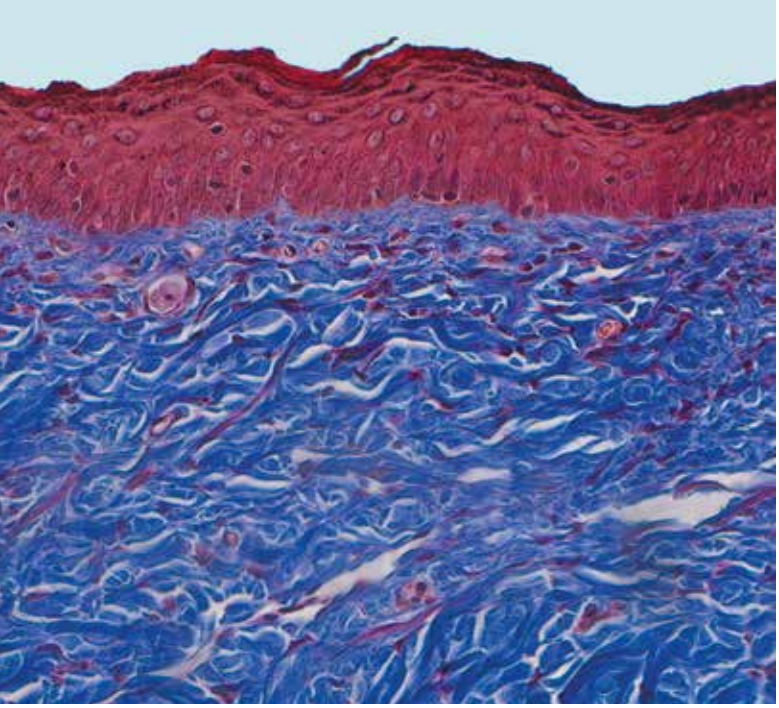
«My fascination for the enormous variety of survival strategies of microorganisms in the most complex habitats and the dormant potential for applications in disease control and biotechnology was the reason why I chose the Master specialisation in Microbiology and Immunology. The various sub-disciplines in microbiology allow the student to become acquainted with a wide range of techniques and also make the exchange with other disciplines possible. During my research project I was able to gain a good insight into the individual research groups and to deal with the respective problems. The impressions and insights gained from this provide an ideal and broad basis for further work in this field.»

Master in Cell Biology

The Master programme in Cell Biology focuses on understanding of fundamental life processes in higher organisms, including growth, division, migration and differentiation of cells as well as cell-cell communication via hormones, cytokines, and growth factors. These processes are studied in the context of cells, tissues and complex organisms, thereby expanding the horizons of cell biology to molecular physiology. Emphasis is also put on understanding the function of key cellular processes in embryonic development, tissue repair, and in inflammatory, metabolic and neuronal diseases and cancer.

The experimental and conceptual approaches include modern cell biological, biochemical and genetic methods, cell culture technologies (2D and 3D, including organoids), innovative molecular imaging techniques, and morphological and physiological technologies.

Students of this Master programme will obtain a broad education in cellular and molecular biology, cellular biochemistry, genetics and genomics, immunology, neurobiology and molecular medicine. They can select among a large variety of courses, allowing them to shape the curriculum based on individual interests.



Mass trichrome colouring of the skin: red the keratins of the epidermis, blue the collagens of the dermis.

«The possibility of investigating and manipulating individual components within a cell has always fascinated me.»

Rahel, Master major in Cell Biology

«A cell is so small that the naked eye cannot see it. And yet it is the scene of more biological processes and events than we can imagine. The possibility of investigating and manipulating individual components of this complex network has always fascinated me. Cell biology is a broad field that combines many exciting aspects of biology, ranging from solid basic research to applied, disease-oriented science. A varied everyday laboratory routine includes a wide range of biochemical techniques as well as microscopy, in vitro and in vivo experiments. The inspiring social environment as well as the cooperation with other research groups contribute to an unforgettable Master period, characterised by exciting discussions.»

«I wanted to dedicate myself to research in an area where tangibility and clinical potential are always in the foreground.»

Christopher, Master major in Molecular Health Sciences

«At some point, it became clear to me that I wanted to dedicate myself to research in an area where tangibility and clinical potential are always in the foreground. In order to be able to look at the human organism as a whole, one has to learn to move in a field that is very rich in aspects and to question and rethink established concepts. Those who want to face the everyday problems of the modern health system must be able to develop very practical approaches to solutions. The multifaceted problems one is confronted with in this field can only be solved in a multidisciplinary and interdisciplinary way by combining natural science and technically skilled engineering. ‹Broaden your horizon and face the challenge› - with this motto I am in the right place in my Master specialisation.»

Master in Molecular Health Sciences

Residing at the interface of biosciences, medicine and technology, Molecular Health Sciences focus on the study of the molecular basis of tissue and organ functions and their responses to stress, diet, environmental challenges and aging and the illumination of organ-organ communication principles, stem cell function and inter- and intracellular signaling networks.

The Master programme in Molecular Health Sciences gives particular emphasis to integrating the knowledge derived from these studies into the context of whole-body function to advance understanding of common complex diseases such as diabetes, obesity, heart disease, cancer, neurological and inflammatory disorders. The development of the scientific basis for rational preventive and therapeutic strategies for the successful management of human diseases is another core component of the programme.

Participants of this Master programme will acquire the experimental skills to apply tools and insights from many disciplines ranging from genetics and genomics, molecular cell biology and physiology to biological chemistry, in vivo imaging, and molecular pathology to address unsolved problems in basic and translational sciences.

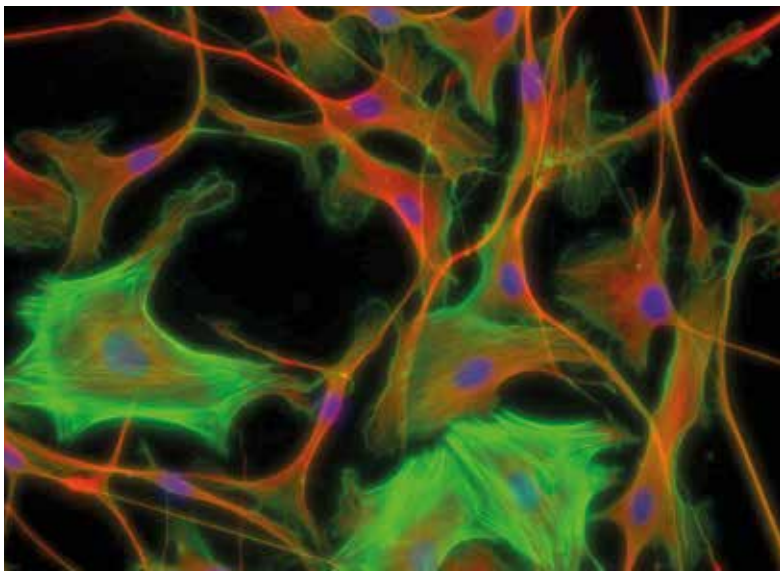
This programme is offered as part of a collaboration in teaching between D-BIOL and D-HEST in the context of the MSc in Biology and MSc in Health Sciences and Technology curricula.

https://www.biol.ethz.ch/en/studies/master/master-degree-majors/molecular-health-sciences.html

and

http://www.hest.ethz.ch/en/studies/health-sciences-and-technology.html

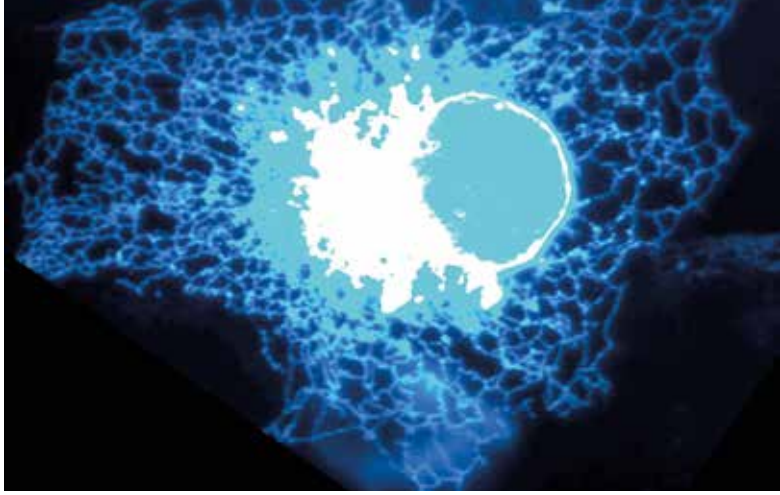
Mixed mouse cell cultures of Schwann cells and fibroblasts.



«I particularly like that the work is highly interdisciplinary and that the exchange and communication of scientific knowledge and data are central aspects.»

Carmen, Master major in Biochemistry

«The Master in Biochemistry offers me just the right thematic and technical diversity that I was looking for in order to acquire as many different skills as possible and to gain broad experience. I find it fascinating that one brings together several experimental approaches to the same biological problem in order to finally combine the individual parts into a large whole. I particularly like the fact that the work is very interdisciplinary and that the exchange and communication of scientific knowledge and data are central aspects. During the one and a half year biochemistry Master I have the opportunity to come into contact with different model organisms such as yeast, bacteria, human cell lines and viruses. Through this I get to know a variety of methods. From a simple PCR, various applications of microscopy and state-of-the-art mass spectrometry to computer-based data analysis, everything is included».



The endoplasmic reticulum: a richly branched channel system of two-dimensional cavities enclosed by membranes (here made visible in a primate cell by a fluorescent jellyfish protein).

Master in Biochemistry

The Master programme in Biochemistry aims at the development of advanced, research-oriented theoretical and practical skills in cellular biochemistry, and communicative, interdiscplinary attitude. The training focuses on the molecular mechanisms and concepts underlying the biochemistry of cellular physiology, and associated pathologies such as cancer.

We put particular emphasis on the question of how these processes are integrated to carry out complex, highly coordinated cellular functions. The investigation and understanding of processes such as intracellular transport, cytoskeletal regulation, cell polarity, cell motility, cell division and cell growth requires a combination of approaches like classical biochemistry and molecular biology, but also cell biology, genetics, live cell imaging and quantitative data analysis.

The successful completion of the Master programme in Biochemistry prepares the student for a professional career in scientific research areas concerned with biological questions on the molecular and cellular level. It provides a solid scientific background for further academic studies towards a PhD followed by postdoctoral training, but also provides the Master graduates with a scientific profile desired for competitive positions in biotechnology, clinical chemistry, and the chemical, biomedical and pharmaceutical industry.

Master in Molecular Plant Biology

The Master programme in Molecular Plant Biology provides students with a deep understanding of plants, from the molecular genetic to the organismal level, and illustrates how plants can be used as a powerful model system to study fundamental biological processes.

The students will discover, both in theory and in their experimental work, how genetic and epigenetic networks steer processes in plants, such as developmental programs, photosynthesis and metabolic fluxes, cellular and systemic responses to external cues such as attacks by pathogens. They will gain insight into how plants evolve and adapt to their environment in an ecological context. Students will also learn how knowledge in plant biology can be applied through plant biotechnology (e.g. genome editing) to contribute to crop improvement and sustainable agriculture.

In a regular colloquium, internal speakers give the Master students insight into cutting-edge research, allowing them to see the types of projects in which they themselves can engage. These internal speakers alternate with internationally renowned guests, whose talks expose the students to a breadth of contemporary topics in the plant sciences.

The students of this major are actively encouraged to take complementary courses that will broaden their knowledge in fundamental areas such as biochemistry and metabolism, cell biology, genetics, microbiology and plant protection, structural biology and systems biology.

«Plants play a number of indispensable roles for us humans.»

Camilla, Master major Molecular Plant Biology

«Nutritional basis, raw materials, nature experiences, oxygen production - plants play a number of indispensable roles for us humans. The construction of organic molecules from inanimate material with the help of sunlight - this ability of plants holds a fascination for me, which led me to choose the Master in Plant Biology. How does the plant manage to adapt its build-up and breakdown of reserve substances so precisely and quickly to changing day and night rhythms? What processes take place at the molecular level? These questions led me to the John Innes Centre in Norwich, England, as part of my second project work. It was a unique opportunity to get to know a research institute abroad. Plant biology offers the opportunity to learn a wide range of molecular methods and to work with the latest techniques.»

Control of the plants of an iron-enriched rice line in the greenhouse: Ensuring the world's food supply is one of the priority objectives of plant biology.

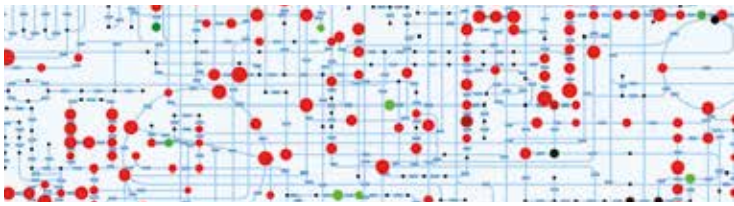
Master in Systems Biology

Systems biology investigates how cells, communities, organs and complete organism function as a whole. This holistic approach allows studying system properties and behaviors that emerge from networks of molecular interactions, which are not observable when focusing on isolated single parts. Because of the inherent complexity of cells, systems biology integrates molecular data with computational and theoretical approaches. It thus combines concepts from different scientific disciplines to obtain a quantitative understanding of complex biological systems in terms of their components and interactions.

Experimentally, the focus is on development and application of novel quantitative methods for global analysis of cellular components (e. g. proteome, metabolomics), their dynamic response to internal and external perturbations, and to chart interactions within and across layers (e.g. between proteins and metabolites). This is a particular strength of ETH Zurich, whose exceptional infrastructure allows to work with the latest technology and pioneer disruptive techniques.

Computationally, the focus is on developing bioinformatics methods for data analysis and mathematical models for in silico experiments. Such methods include statistics, machine learning, or deterministic models that uses differential equations to accurately describe mechanisms and kinetics. Model-based integration of large and heterogeneous data sets opens new perspectives for deeper insights into human disease as well as development of new therapies and novel biotechnological processes. This interdisciplinary major is designed for biologists, bioinformaticians and computer scientists and promotes interdisciplinary communication skills.

The systems approach holds for virtually all biological systems. Hence, the fields of application span from basic to applied research and from microbes to plants, animals, and humans (e.g. personalized health). Depending on interests and capabilities, a focus on theoretical or experimental aspects will be encouraged.



Networks of enzymes and metabolites are the basis of metabolism in all cells. Modern methods of mass spectrometry measure many metabolites simultaneously (red dots). Such measurements provide precise information about changed cell behaviour, e.g. in sick cells, under different nutritional situations or during interaction with other cells.

Dario, Master major Systems Biology

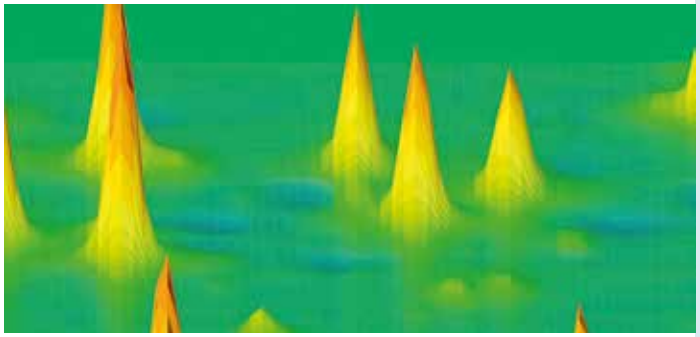
«For me, the attraction of doing a Master in Systems Biology lies in the interdisciplinary nature of this specialisation. It combines biological issues with areas of mathematics, statistics and computer science. I found learning new methods and techniques and the exchange with other disciplines extremely exciting and enriching. The work during my semester projects combined conducting my own experiments with data analysis and mathematical modelling. The projects are therefore very varied. I also find the interplay between experiment and model interesting, because new hypotheses from the modelling can be tested immediately. I am sure that the techniques of systems biology can be applied in many areas of biology to study complex biological processes.»

«The interdisciplinary approach of systems biology combines biological questions with areas of mathematics, statistics and computer science.»

Master in Molecular and Structural Biology

The Master programme in Molecular and Structural Biology provides a strong background in the molecular life sciences with a particular emphasis on structural and mechanistic aspects of biology. The major is anchored in the Institute of Molecular Biology and Biophysics, where research groups investigate central cellular processes such as transcription, splicing and translation as well as protein folding and degradation with a focus on the participating molecular machines. They also study membrane transport proteins and molecular assemblies involved in cell-to-cell adhesion and communication.

This Master programme offers many and diverse courses: In molecular biochemistry classes, the principles of relating the functions and mechanisms of biological macromolecules with their structures are discussed. A second set of courses introduces students to modern techniques used for three-dimensional structure determination of proteins and nucleic acids including X-ray crystallography, NMR spectroscopy and electron microscopy. It also organizes a course on biophysical methods that can be applied to unravel the mechanisms of biological macromolecules, including modern techniques in fluorescence and single-molecule spectroscopy. These classes can be flexibly combined with courses from other majors to provide students with a curriculum optimally tailored to their individual interests.



State-of-the-art structure determination methods are already used during the course of studies: Section of a spectrum of the protein ubiquitin in three-dimensional representation, recorded on a 600MHz NMR spectrometer.

Participants of the programme will become experts in experimental biochemistry, which includes protein production, purification, and in vitro reconstitution of their native macro-molecular assemblies. They will be trained in biochemical and biophysical characterization of these assemblies in physiologically relevant states, and will have an opportunity to employ biophysical techniques to study interactions between biological macromolecules and their ligands, as well as in three-dimensional structure determination and quantitative analysis of reaction mechanisms on the molecular level.

«In the field of molecular and structural biology, an incredible variety of methods is used.»

Fabia, Master major in Molecular and Structural Biology

«The fascination of observing biologically and medically relevant macromolecules at the atomic level, understanding their dynamics and deciphering their function from this has led me to choose the Master programme Molecular and Structural Biology. If I were faced with this decision again today, I would decide in exactly the same way. The reasons? Firstly, certainly the incredible variety of methods used in this field. Furthermore, I have experienced a very strong team spirit and positive motivation in the research groups. These two aspects provide Master students with an extremely stimulating environment that leaves plenty of room for the development of new ideas and promotes the independent development of projects».

Master in Biological Chemistry

Drawing a clear boundary between chemistry and biology is nearly impossible today given the explosive growth of technologies for synthesizing large organic molecules such as proteins, nucleic acids, and complex carbohydrates. In the future, scientists investigating the foundation and processes of life will increasingly have to master chemical methods, including organic synthesis, mass spectrometry, NMR and other spectroscopic tools, as well as modern separation methods. Equally important is a solid foundation in biological techniques such as culturing bacteria, gene cloning and mutagenesis, DNA/RNA analysis, protein purification and functional and structural characterization, and a thorough enzymological examination of biocatalysts. Today, biological chemists also employ computational and evolutionary approaches to study - and even design - complex biomacromolecules. These may serve as powerful tools for testing specific biochemical hypotheses or for performing tasks not yet seen in nature.

A specialization in Biological Chemistry offers a biologically oriented alternative to the Master curricula «Biochemistry - Chemical Biology» and «Interdisciplinary Sciences» offered in the Department of Chemistry and Applied Biosciences (D-CHAB). Its chief aims are to understand the chemical reactivity of biological molecules in living organisms and to learn to recognize and solve current problems in biomolecular design, engineering, and analysis. Students will often perform research projects both in D-BIOL and D-CHAB groups to acquire experimental skills toward synthesis, purification, and characterization of molecules ranging in nature and size from the very small (medicines and enzyme inhibitors) to the extremely large (genes and proteins and their complexes).

At the interface between chemistry and biology, the Master›s specialisation in Biological Chemistry deals, for example, with the synthesis of pharmaceutically active compounds.

«During the semester projects, I particularly appreciated the fact that I was actively involved in planning the experiments.»

Raphael, Master major Biological Chemistry

«If you want to know more about the chemical and molecular bases that determine the structure of life, biological chemistry is the right place for you. I am fascinated by the discipline because it deals with the function, production and modification of all biological building blocks, from low-molecular compounds to macromolecules. Accordingly, the range of lectures is broad and has enabled me to specialise in organic chemistry, enzymology and structural biology, among other things. During my term papers in synthetic organic chemistry and protein engineering I particularly appreciated that I was actively involved in planning the experiments. I became familiar with the various techniques and now better understand how creative and challenging research ideas are implemented at the interface between biology and chemistry.»

The Master degree in your pocket - and then?

A fundamental aim of the education leading to a Master degree is to prepare students to work independently in an academic or industrial research laboratory. However, a Master programme also equips students with a competence profile that will also be in demand in a wide range of industries. Before biology graduates directly enter a profession, many of them continue their education. The options listed below are those most frequently chosen.

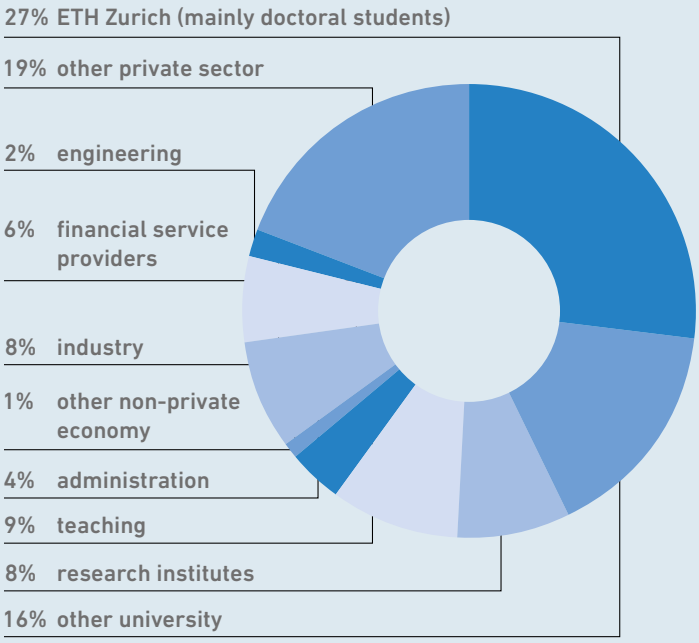
Doctorate
For the vast majority of biology Master graduates, the next step has already been decided before the end of their studies: they continue with a doctorate - regardless of whether they see their future in research, a teaching profession or other areas. Some stay at ETH for this step, others are attracted to another university. There are two ways to get a doctorate at ETH. Firstly, there are the various doctoral programmes that are coordinated under the umbrella of the «Life Sciences Zurich Graduate School». Information on the individual programmes can be found here: https://www.lifescience-graduateschool.ch

On the other hand, a student interested in a particular field can also apply directly to the heads of research groups. Often such positions are advertised on the respective websites, but even without an advertisement it can be worthwhile to contact a laboratory directly.

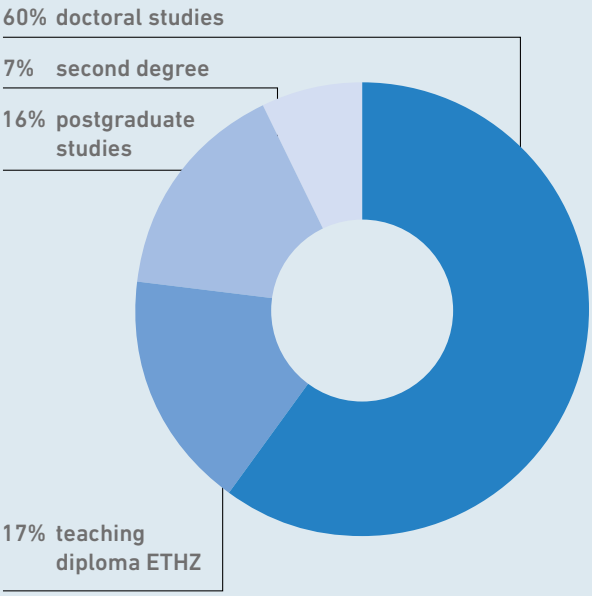
Teaching diploma
Anyone considering a teaching profession in the subject of biology completes the additional studies leading to a teaching diploma in biology. This entitles the holder to teach at grammar schools or with additional training at vocational schools. Students can begin as soon as they have obtained their Bachelor degree. A Master degree is required for the teaching diploma to be awarded. Further information: https://www.didaktische-ausbildung.ethz.ch

Postgraduate studies
In addition to the above-mentioned options, a wide range of postgraduate studies is available to the Biology Masters, some of which can be completed in modules while working. Such postgraduate studies are generally offered by ETH, other universities, universities of applied sciences and also private educational institutions.

Employers and sector



76% of all Biology Masters continue their education



Professions of biologists: different goals, different paths

The study of biology is a study in a basic scientific subject. This fact means that it does not prepare students for a specific profession, as is the case with studies in architecture or pharmacy, for example. The good thing about it is that graduates are offered a huge range of career opportunities where biologists are in demand. Research - whether at universities or in industry - is only one of the possible career paths. The same applies to teaching professions. In addition, graduates can choose from a range of other jobs. They all have one thing in common: those who have successfully completed a Master programme have also shown that they are able to think and act in a goal-oriented, solution-oriented, pragmatic and networked way. These are skills that are in demand almost everywhere in demanding positions - whether in the biomedical or pharmaceutical industry, in administration, in associations, in teaching professions, but also in consulting, in health care, in service companies or in interdisciplinary fields of activity.

A few selected examples illustrate below how differently the careers of different biologists have progressed after graduation.

Prof. Annette Oxenius, Professor of Immunology, ETH Zurich

«With my international and motivated team we are researching the properties of the immunological defence in connection with viral and bacterial infections. This basic research is extremely exciting and thanks to the great commitment and enthusiasm of the team, new and exciting findings are constantly emerging - but also new questions. My personal challenge is to master the various aspects of my job, namely basic research, supervision of the research team, teaching for students and other academic and social tasks in the best possible way.»

«The biggest challenge in my work is to translate the language of science and technology into the language of the insurance industry, which requires scientists with broad knowledge, but who can also go into depth if necessary.»

Dr. Reto Schneider, Head of Emerging Risk Management, Swiss Reinsurance Company

«My tasks as an entrepreneur range from the market orientation of the company and its products to project management and personnel management.»

Dr. Corinne John, co-founder and Executive Vice President, Redbiotec AG

Dr. Corinne John, co-founder and Executive Vice President, Redbiotec AG

«I completed my education in biochemistry with a doctorate at ETH Zurich. In addition, I took advantage of the opportunities there to further my education in the field of management. Shortly after my doctorate, I founded an ETH spin-off company with colleagues, which is active in vaccine development. Today, I am responsible for strategic issues. I find the work as an entrepreneur exciting and diverse, as it combines science and business. The tasks range from market orientation of the company and its products to project management and human resources. The scientific education helps me to approach the different areas analytically and solution-oriented.»

Dr. Reto Schneider, Head of Emerging Risk Management, Swiss Reinsurance Company

«After studying cell biology and completing a doctorate in the field of immunology at ETH Zurich, I started working for the Swiss Reinsurance Company in 1994. At that time, Swiss Re was already offering programmes for academics of various disciplines and continues to do so today with its Graduate Programme. For many years I headed the liability group of the Risk Engineering Services Department. In this role, I was responsible for the development of risk assessments in various industries. The spectrum of companies assessed ranged from oil / petrochemicals, car manufacturers, pharmaceutical companies and medical equipment manufacturers to hospitals, railways and many more. This work then brought me into a new area of responsibility. I am currently head of Emerging Risk Management and am responsible for early warning, the identification of new risks - in short: horizon scanning - at Swiss Re. The biggest challenge in my work is to translate the language of science and technology into that of the insurance industry. At the end of the day, you can only reach people with stories that affect them personally. This requires scientists with broad knowledge, but they can also go deeper if necessary. Pragmatic, solution-oriented thinking is essential for a successful career in business. My education at ETH Zurich has provided me with the best conditions for this.»

Dr. Alexander Rauch, teacher, secondary school Olten

«The decision to become a teacher came to me unconsciously at first. After completing my doctoral thesis, it was important to me to be able to share my enthusiasm for biology with other people and to be able to implement ideas independently. When a teaching position at the Kantonsschule Olten became available, I accepted without hesitation.

To this day I have never regretted my decision - on the contrary. Biology is a subject that can quickly inspire young people - not least because the possibilities of teaching biological concepts are almost unlimited today. After the extreme specialisation in the doctorate, as a biology teacher I have to have an enormously broad knowledge, recognise overriding principles and ultimately be able to teach this successfully. This is a great challenge, but one that is worthwhile in every respect. I have become a teacher because I get a concrete reference to my tasks as a teacher every day in the classroom, working with my students. Lessons often turn out differently than planned.

Each class is made up of different young people and thus becomes an exciting challenge. For me, the profession of a teacher is just as intensive and demanding as that of a researcher and therefore not just a profession, but a vocation.»

Dr. Dominik Brem, expert on sustainability and scientific concepts, IB Buildings, ETH Zurich

«After studying biology and doing my doctorate at ETH Zurich, I was attracted to industry, where I worked for six years as a project manager and consultant. The broad-based knowledge transfer in biology studies was the ideal basis for me to quickly familiarise myself with new problems. In my function within the IB Building at ETH Zurich, responsible for sustainability and scientific concepts, the activities are very different. Together with researchers, I work on scientific concepts for new buildings or new working groups/professorships - always with a view to meeting researchers› infrastructure requirements. In planning and construction, we set the standards for sustainability and energy efficiency and provide support during the various construction phases. In doing so, it is possible to play a significant role in shaping and implementing ETH Zurich's sustainability strategy. ETH Zurich's claim to play a pioneering role in Switzerland and internationally in terms of the environment and sustainability makes this job between research and services incredibly exciting.»

Csilla Priest, Project Manager, Pennside Partners GmbH

«Not every biology graduate wants to continue with a PhD after graduation. Research is the logical, but not the only possible goal of biology education. I didn't want to go into research, but I still wanted to stay close to the faculty - this is why I chose the pharmaceutical industry. For biologists without a doctorate, the entry into pharmaceutical marketing is a good option. Typically, you start as a sales representative, i.e. a pharmaceutical sales representative. In direct contact with our customers, the doctors, I got to know the industry from scratch and laid the foundation for my future career. In my current job in pharmaceutical consulting, I apply the experience I have gained from my studies and career to my customer projects, analyse and evaluate current trends in the pharmaceutical market, observe how new products are brought to market through clinical studies and the complex approval process and finally how they are replaced by generics or even more up-to-date technologies. In this way I see every day how state-of-the-art biology is applied in the pharmaceutical industry.»

«In my work in pharmaceutical consulting, I see every day how state-of-the-art biology is applied in the pharmaceutical industry.»

Csilla Priest, Project Manager, Pennside Partners GmbH

Lena Stallmach, science journalist, NZZ

«I never dreamed that one day I would become a journalist. Writing was always a horror for me. But biology and research fascinated me. During my thesis and a job as a technician, however, I realised that I was less interested in research and more in literature research on various topics.
It was at this time that I became interested in science journalism. I attended a four-week course in science journalism at the MAZ in Lucerne. At the same time, I applied for an internship at various newspapers. I was accepted by a local newspaper in the Bernese Oberland. There I not only learned to write, but also really enjoyed it. After an internship at the NZZ am Sonntag, I was lucky enough to get a permanent position in the scientific editorial department of the NZZ.
Five years later, research is still my favourite pastime. It fascinates me to get to the bottom of something: How did the researchers arrive at their results, which way did they go about it, what has been published before? Sometimes the enthusiasm fizzles out because there is less behind it than announced. Other times it is followed by astonishment or even admiration. Sometimes I unexpectedly come across a completely different story. In any case, it remains exciting to dive into new topics again and again.»

«I can continue to live out my passion for life sciences and research in my job and also work in a highly dynamic environment.»

Dr. Gilbert Grima, Partner, Bain & Company

«After studying biology at the ETH and a doctorate in brain research at the University of Zurich, I started as a consultant with Bain & Company in Zurich in 2001. At that time, I was drawn from academic research to a different environment with new challenges. Today, it is still crucial for me to work with outstanding personalities in a strong team culture - I have found this in international management consulting at Bain. At Bain, you start out as a generalist, managing projects with clients from different industries. Over the years, I have specialised in healthcare, especially pharmaceuticals. This allows me to continue to live out my passion for life sciences and research and also to work in a highly dynamic environment. Working daily with «Bainies» and our customers, where we solve the most difficult problems together and full of passion, fascinates me and gives me the necessary energy for my profession. I am also motivated by the fact that I am also indirectly working on people›s health and well-being.»

ETH Zurich: a first-class place to study

Freedom and individual responsibility, entrepreneurial spirit and open-mindedness: ETH Zurich stands on a bedrock of true Swiss values. Our university for science and technology dates back to the year 1855, when the founders of modern-day Switzerland created it as a centre of innovation and knowledge. At ETH Zurich, students discover an ideal environment for independent thinking, and researchers find a climate which in-spires top performance. Situated in the heart of Europe, yet forging connections all over the world, ETH Zurich is pioneering effective solutions to the global challenges of today and tomorrow.

Some 540 professors teach around 22,200 students – including nearly 4,200 doctoral students – from over 120 countries. Their collective research embraces many disciplines: natural sciences and engineering sciences, architecture, mathematics, system-oriented natural sciences, as well as management and social sciences. The results and innovations produced by ETH researchers are channeled into some of Switzerland's most high-tech sectors: from computer science to micro- and nanotechnology and cutting-edge medicine. Every year ETH registers on average 100 patents and 150 inventions. Since 1996, the university has produced a total of 437 commercial spin-offs. ETH also has an excellent reputation in scientific circles: 21 Nobel laureates have studied, taught or researched here, and in international league tables ETH Zurich regularly ranks as one of the world's top universities.

One university, two locations

ETH is spread over two locations in Zurich. On the one hand, there is the main building and the surrounding buildings in the centre of the city, just a few minutes' walk from the main station. These locations are easily and quickly reached by Polybahn, trams and buses.

On the other hand, there is the Hönggerberg location, situated just outside the centre in Zurich Höngg in the countryside. This campus has been continuously expanded since its creation. While in the first decades it was only teaching and research buildings that were built here, new uses have been added in recent years. More and more, the Hönggerberg is becoming a campus that is not only accessible to students and researchers, but also involves the local population. It no longer serves only teaching and research, but is also very lively after work. The Hönggerberg

campus offers cafeterias and various shopping facilities, a food market with a varied range of products in the square in the centre of the campus, extensive sports facilities in a multi-functional hall and the surrounding forest and grassland, cinema evenings and various other events such as lecture series, concerts and guided tours.

But it is not only learning, working, eating and shopping that can be done on campus, but for some time now also living. Despite the physical distance, the two locations, Zentrum and Hönggerberg, are not separated from each other. A regular direct bus service, the ETH Link, connects them in just over 10 minutes and ensures that the distance is not an obstacle to move between the two locations.

Student life

Studying at ETH Zurich is challenging, but the university also offers a balance and plenty of variety with sports, culture, gastronomy, bars, cinema, concerts, parties, a ball and much more for the time when classes are not in session.

Apart from individual sports, which everyone can do as they please, the Academic Sports Association of Zurich (ASVZ) is responsible for physical training at the universities. Whether rowing, archery, indoor climbing, basketball, swimming, yoga or tai-chi, indoors or outdoors - there is hardly a sport that the ASVZ does not offer. In addition, there are courses and camps where you can not only broaden your sporting horizons, but also make new friends beyond the boundaries of your own studies.

But sport is by no means the only thing that ETH Zurich offers its students. They can, for example, become actively involved in higher education policy, e.g. in the Association of Students at ETH (VSETH) or in one of its specialist associations.

The VSETH offers a wide range of services. Together with the professional associations of the individual study programmes, it forms a platform for those who wish to represent students' interests in ETH internal committees, but is also responsible for the fun part of student life; for example, the legendary polyball, the film centre or the cultural centre.

The professional association of biology students and a subsection of VSETH is the VeBiS (Association of Biology Students). It not only supports students in preparing for their exams in the first four semesters, but also gives them a voice in the further development of their biology studies and organises information events and company visits, as well as social get-togethers, parties and other events.

The positive development that has taken place at ETH Zurich in recent years with regard to food is also worth mentioning. Today a hungry stomach and a thirsty mouth can choose from a wide variety of cafeterias, restaurants, food stands and bars. For example, there is a kebap stand at Polyterrasse, a restaurant specialising

in rice at Hönggerberg, in the Alumni Lounge the food is served in silex, and in the summer there are barbecues and streetfood stands with delicacies from all over the world at the Hönggerberg Piazza and the Polyterrasse. Last, but not least: It goes without saying that vegetarian and vegan meals are also widely available.

Zurich: Everything the heart desires

Of course, student life does not only take place at ETH Zurich. Zurich, the largest city in Switzerland, with its wonderful location on the lake and its proximity to the Alps, also offers almost everything the heart desires.

The city is international, one big event follows the next, it has an endless wealth of restaurants and bars, cultural life, museums and shopping facilities - the list could go on and on.

And yet the city is manageable. On hot days you can reach the lake in no time, and even within the city there are many green areas and quiet neighbourhoods. Those who like to be outdoors, do sports or simply appreciate the distance from city life are immediately outside the city limits in the woods, fields, lakes or rivers. With a good view from one of the surrounding hills, it soon becomes clear that Zurich is only a stone's throw from the mountains. In winter, a commuter train takes you directly from the main station to a nearby ski resort, in summer you can soon be on your racing bike to the first pass or on the extensive Swiss hiking trail network.

Another advantage: Zurich is very centrally located. Lucerne, Berne, Basel, Winterthur, St. Gallen, Chur - all major Swiss cities that can be reached in an hour or less. So there are plenty of reasons to make Zurich your future place of study and residence.

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