medicine close to life

open practical innovative specialised generalist international translational multidisciplinary

fundamental clinical dental
The University of Geneva Faculty of Medicine blends teaching, research and health care of the highest quality in direct contact with its home city and with many countries in the world.

The Faculty’s internationally recognised fundamental research, in partnership with the largest hospital complex in Switzerland, the Geneva University Hospitals (HUG), means that the conditions are in place for a major translational research capacity with other actors in the region.

We are an innovator in medical education. We equip doctors with the knowledge, skills and, above all, the maturity required to practise medicine based on evidence, economy and humanity. In response to contemporary social challenges, we place considerable emphasis on primary health care and family medicine practitioners participate in developing our courses.

The recent extension of the University Medical Centre to accommodate among others the Dental Medicine department and the Geneva-Lausanne School of Pharmacy, offers the prospect of new projects with the Faculty of Sciences.

Our international outlook means that we have developed long-term links with developing and emerging countries at both undergraduate and postgraduate levels. The relations are academic and humanitarian and involve the HUG as well as governmental and non-governmental organisations based in Geneva.

At the local level, the Faculty helps to provide scientific and medical information to the public and to develop productive partnerships with financial and industrial actors. A number of local foundations are also long-standing partners, such as the Louis-Jeantet Foundation for Medicine which has supported the Faculty for over twenty years.

Drawing on its distinguished past and firmly embedded in a dynamic present, the University of Geneva Faculty of Medicine looks forward to the future with optimism.

Professor Henri Bounaumeaux
Dean
The University of Geneva Faculty of Medicine was founded in 1876 and since then has been the leading French-speaking medical school in Switzerland. By the beginning of the 20th century its success in attracting growing numbers of foreign students, and Swiss students from other cantons, meant that the infrastructure was overwhelmed. The outbreak of the First World War (1914) meant, however, a drastic reduction in numbers. Even though the following years were difficult, the recruitment of clinicians such as Louis Bard and Adolphe Franceschetti, and researchers such as Max Askanazy and Jean-Amédée Weber, ensured that the Faculty remained forward-looking. Other important figures of that period included Lina Stern, a graduate of the Faculty and the first woman to be appointed Professor in 1918.

After the Second World War, inspired by the American model and by the international aspirations of Swiss universities and the Swiss National Fund (SNF created in 1952), the Faculty acquired the resources to pursue its ambitions and secure its scientific standing by training a large number of specialist doctors and researchers. In the 1970s, faced with the need to adapt to scientific advances and the growing number of students, activities were re-structured into departments. The final years of the 20th century saw an increase in the competitiveness and sophistication of research which demanded new approaches in the training of practitioners. From 1995, therefore, the Faculty engaged in a major reform of medical studies.
The Faculty of Medicine is a European pioneer in medical training. In 1995 it had the courage to discard traditional practices and put new methods, close to clinical reality, in place. Thus, from the second year of studies, instead of a disciplinary approach, a practical problem-based approach closer to the patient is applied. From being vertical, teaching became horizontal. Each theme (e.g. infection, respiration, circulation) is addressed in a module ranging from basic science (biology, biochemistry, physiology) to clinical aspects (physiopathology, symptomatology, diagnosis and treatment).

By working in small groups, students can apply their theoretical knowledge and clinical skills and learn about the importance of working relationships. Social questions are addressed throughout (organisation of the health system, health economics, health insurance, ethical and psycho-social issues) and students are encouraged to examine their own motivation. The Medical Faculty continues to work on the provisions of the Bologna Declaration which promotes the mobility of students in Europe by simplifying recognition of qualifications.
From the second year, a variety of methods based on clinical examples are introduced.

**Problem-based learning**
This approach is used during the pre-clinical years. Presentations of a range of illnesses are analysed by groups of about ten students led by a tutor. The students learn basic medical science in order to understand normal and pathological functions of the body.

**Problem-solving**
This method is adapted from the approach used during clinical training. The student is required to go beyond an explanation of what has been observed to the solution of a clinical problem from diagnosis to patient care.

**Simulated and standardised cases**
A healthy individual is trained to enact the history, clinical signs and emotional experiences of a real case in the most convincing way possible.

**Patient instructor**
A real patient who has been trained to guide the student and to give him/her feedback during assessment.
UDREM (Unit for Development and Research in Medical Education). UDREM was established in 1994 to supervise the quality of medical training. It supports the Faculty in delivering and maintaining high-quality teaching and evaluation. UDREM is recognised as a model for Europe.

The community integration module examines a health problem from a psycho-social perspective. It is conducted over 4 to 6 weeks in groups of 3 to 4 students. The course sometimes takes place abroad. Students consider health and human rights, and exclusion and poverty.

Starting in the first year, the Individual, Health and Society Programme introduces students to current public health problems.

The clinical skills programme consists of 80 seminars of 2 hours each over 2 years. Small groups are led by an instructor. Subjects covered are: case history, symptomatology and physical examination, doctor-patient relations, education of the patient, technical and emergency procedures, vital signs, laboratory and radiology techniques. There are several training sessions with standardised patients or patient instructors.

The Faculty of Medicine of the University of Geneva was the first in Switzerland to be accredited by ENQA (European Association for Quality Assurance in Higher Education).

Elective courses offer access to humanist subjects which have often disappeared from the medical curriculum over the last 50 years. Knowledge of these disciplines is nonetheless inescapable for medical practice in the 21st century because, in our societies, techniques that are inadequately controlled risk becoming uncontrollable. The subjects chosen can be drawn from philosophy, literature or art with a view to offering the student new perspectives on illness and the ill person, or international health or human rights.

EMG (The Association of Medical Students of Geneva) opens the way for direct student participation in Faculty decisions. It also organises a mentor system (Parmed) to welcome and assist new students. Those who are also members of the International Federation of Medical Students organise international exchanges.
Undergraduate training (bachelor, master, Federal Medical Diploma) is followed by postgraduate training leading to a doctorate or to a Master of Advanced Studies (MAS). In order to practise medicine a postgraduate qualification is required. The right to practise privately is regulated at the federal and cantonal levels. The Geneva Faculty of Medicine offers a Master of Advanced Studies (MAS) in Clinical Medicine. This helps doctors from outside the European Union who are not eligible for Swiss Federal Board Certification, to return to their countries with a specialist diploma. The Dental Medicine department also offers a MAS in Dental Medicine.

Specialties:
- Master of Advanced Studies (MAS) in Clinical Medicine
- Specialties in Clinical Medicine (FMH)
- Dental Medicine
- Specialty in Dental Medicine (SSO)
- Master of Advanced Studies (MAS) in Public Health
- Master of Advanced Studies (MAS) in Medical Informatics

Faculty Doctorates:
- Doctorate in Medicine (MD) or Dentistry (MDD) (during specialisation)
- Doctorate in Medical Sciences (MD-PhD)
- Doctorates in Biomedical Sciences (PhD)

Interfaculty Doctorates:
- Doctorate in Neurosciences (PhD)
- Doctorate in Science (PhD)

Primary Care: a Priority

A range of indicators show that, as needs grow with an ageing population, Switzerland will not be able to offer the full range of primary care services in 10 to 20 years. In Geneva, primary care doctors (General Practitioners) currently represent about half of the total medical establishment. This proportion will be difficult to maintain in the future. This is a nation-wide issue and it has prompted the Medical Faculty to re-think the medical training system. In order to prepare for the future and to improve the attraction of a career in primary care, the Faculty supports networking, multidisciplinary approaches, task sharing and improvement in the quality of life of general practitioners.
Understanding for better care: this is the conviction underlying research at the Faculty of Medicine. There are over 250 research groups divided into three main sections (fundamental, clinical and dental medicine) and their related departments. There is close cooperation between the Faculty and the HUG.

Clinical Medicine Section
The section’s purpose is the acquisition of knowledge about people and illness. It orients its research towards new therapies, improvement of diagnostic tools, prevention, quality of care and patient support. Generally located within the HUG structures, the clinical research groups within the Faculty are distributed amongst the following 10 departments:

- Department of anaesthetics, pharmacology and intensive care
- Department of surgery
- Department of gynaecology and obstetrics
- Department of internal medicine specialties
- Department of clinical neurosciences
- Department of paediatrics
- Department of psychiatry
- Department of radiology and medical informatics
- Department of general internal medicine, rehabilitation and geriatrics
- Department of community health and medicine
**Fundamental Medicine Section**

Research focuses on knowledge about the normal functioning of the human body, the changes which illness brings and the development of new therapeutic molecules.

- Department of fundamental neuroscience
- Department of genetic and developmental medicine
- Department of pathology and immunology
- Department of cell physiology and metabolism
- Department of microbiology and molecular medicine
- Department of the science of human proteins

**Dental Medicine Section**

Dental medicine was first recognised as a profession in 1815 in Geneva and the first national dental school in Europe was established here in 1881. The teaching programme which led to the Degree of Dental Surgery with the right to practise was the model for the federal law of 1888 on the right to practise dental surgery in Switzerland. The Dental School became part of the University in 1918 when it became the University Dental Institute then the Dental Medicine Section of the Faculty of Medicine in 1964. It is the only undergraduate and postgraduate French-speaking dental school in Switzerland.

The main aim is oral health, which is one component of the general public health strategy. Dental medicine addresses prevention, improvement in diagnostics, patient care, transmission of knowledge and skills, and development of methods and instruments to meet the needs of the population.

- Division of cariology and endodontics
- Division of fixed prosthesis and occlusodontics
- Division of preventive dental medicine
- Division of orthodontics
- Division of oral physiopathology and periodontics
- Division of gerodontics and removable prosthesis
- Division of stomatology and oral surgery
Scientific excellence at the Faculty of Medicine is linked to an intensive focus on PRIORITIES:

- neurosciences
- chronic illness (metabolic and vascular)
- medical genetics
- imaging and information science
- transplantation and stem cells
- host-pathogen relationship
- humanitarian medicine.

The Faculty of Medicine participates in national and European research efforts in these fields as well in interfaculty centres at the University of Geneva.
Resolutely Patient-Oriented, the Clinical Research Centre (CRC)

The Centre, supported by the Swiss National Fund, opened in 2007. It works across several departments at the HUG and the Faculty to develop large-scale research projects using modern methods of in-patient care. It offers postgraduate training in clinical research to health professionals and develops partnerships particularly with industry. Equipment and expertise are made available to researchers. The Centre is organised into 2 units: the Clinical Investigation Unit (UIC) and the Methodology Support Unit (UAM). It provides grants for senior and junior researchers with a focus on translational projects. The Centre offers training in Good Clinical Practice (GCP) and ensures the quality of clinical research at the HUG particularly with regard to Swiss Clinical Trial Organisation (SCTO) standards and those of monitoring agencies such as Swissmedic.

Genetics and Genomics: Towards Personalised Medicine

The new iGE3 (Institute of Genetics and Genomics of Geneva) was created by the Faculty of Medicine and the Faculty of Science. Its 64 research groups bring together the clinical and fundamental research expertise and skills available in Geneva to provide a centre of excellence in life sciences. It builds links between research groups and guides young researchers. iGE3 is strengthening its existing cooperation with the Center for Integrative Genomics of the University and Polytechnic of Lausanne and this has led to a “Silicon valley” of life sciences covering the whole of the Lake Geneva region. In addition to a strong commitment to fundamental research, iGE3 is also concerned with the interactions between genetics, metabolism and pathology, the aim being to construct a “biological” profile of a patient in order to propose effective treatment.

www.ige3.unige.ch
Technology platforms, analytical instruments and laboratory products are available to researchers in the Faculty of Medicine and the Faculty of Science and other university and hospital institutions in the Geneva region (Lausanne University and Polytechnic and Geneva and Lausanne university hospitals), and to private research centres. They are managed by highly qualified scientists. An immense research potential covering many different fields in life sciences is thus offered.

State-of-the-Art Instruments: Faculty Services for Research

Bio-imaging
Photon microscopy for the examination of live and fixed cells

BioStock
Sale of biological, chemical and plastic laboratory supplies

Murine behaviour
Behavioural studies on mice

Flow cytometry
Flow cytometry service

Genomics
Advice and access to state-of-the-art genomic technologies (high speed sequencing, DNA microarrays for transcriptomic and genotype studies, nCounter, PCR in real time)

Histology
Dehydration, embedding, sectioning (cryostat, paraffin), staining, immunocytochemistry and hybridisation in situ of specimens for optical microscopy

Medical imaging (CIBM)
The centre for biomedical imaging (Universities of Geneva and Lausanne, Lausanne Polytechnic and Geneva and Lausanne university hospitals).

Radiological imaging (LAVIM)
Collection and analysis of radiological images

Electron microscopy
Cell/tissue ultrastructural analysis by transmission electron microscope

Phenotyping of small animals
Phenotyping of small animals through anatomical, functional, physiological and metabolic analyses

Proteomics
Analysis of protein samples

DNA sequencing
Production of DNA sequences from matrices and primers

Transgenesis
Production, decontamination and cryopreservation of transgenic mice; in vitro fertilisation

Animal facility
Breeding and care of laboratory animals

Quarantine of experimental animals with Class 2 biological agents
Some of the research activities are carried out by institutes, centres and platforms which complement those of the Faculty of Medicine by bringing other perspectives in related or cross-cutting fields.

Institute of Social and Preventive Medicine (ISMP)
Geneva Tumour Registry
Institute of Legal Medicine – University Centre of Legal Medicine, Lausanne - Geneva (CURML)
Institute of Biomedical Ethics
Institute for Environmental Sciences
Geneva Institute of Genetics and Genomics
Institute of the History of Medicine and Health
Institute of Primary Care Medicine
The Swiss Institute of Bioinformatics
Institute for the Science of Movement and Sports Medicine (ISMMMS)
Interfaculty Centre for Bioethics and the Humanities in Medicine
Interfaculty Centre for Bioinformatics
Interfaculty Centre for Gerontology (CIGEV)
Interfaculty Neuroscience Centre
Geneva Centre for Education and Research in Humanitarian Action (CERAH)
Centre for Biomedical Imaging (CIBM)
Clinical Research Centre (CRC)
Swiss Centre for Applied Human Toxicology (SCAHT)
Financial Support – Why?

The University of Geneva Faculty of Medicine is committed to maintaining high scientific and academic standards so that researchers and students benefit from an optimal enabling environment. Various philanthropic partners support the Faculty. By financing a Chair or a research project, or by making a gift, they support teaching and research and help to ensure the success of our institution.

For every franc the State invests in research by the Faculty, a grant of one franc is given by private foundations or by the Swiss National Science Foundation. State support is mainly for salaries.

The Medical Faculty creates more jobs funded by private sources than any other faculty in Geneva. While interfaculty collaboration is a major contributor to research in Geneva, the scientific activities of the Faculty reach well beyond the city and Canton. Researchers are heavily involved in the Science-Vie-Société projects of the Lake Geneva region with the Universities of Geneva (UNIGE) and Lausanne (UNIL) and the Federal Polytechnic School of Lausanne (EPFL). Several teams work with various national research communities (NCCR) as well as at the EU level. There are close links with international organisations such as the World Health Organisation (WHO).

Long-Standing Partners

La Fondation Louis-Jeantet
La Fondation Giorgi-Cavaglieri
La Fondation Leenaards
La Fondation Artères
La Fondation Centre de Recherches Médicales Carlos et Elsie de Reuter
La Société Académique de Genève
La Fondation Gertrude von Meissner
La Fondation Dr Dubois-Ferrière Dinu-Lipatti
La Fondation Ernst et Lucie Schmidheiny
In the search for efficiency, the Geneva and Vaud (Lausanne) University hospitals (HUG and CHUV) have developed a cooperation plan which groups activities and lays out operational methods. Community medicine is provided at all sites whereas the infrastructure and personnel required for highly specialised medicine is planned at the level of the Lake Geneva region, in the whole of the Swiss French-speaking region and even at the national level. The concentrations of activity follow criteria which include the quality of care and research, the availability of highly qualified personnel, a critical mass of illnesses and economic efficiency. For each medical discipline, the choice of academic and/or clinical activities for a particular site (or for two sites) is made in light of the level of specialisation needed, the cost of equipment, and the spread of the client population.

The University Hospitals Transplantation Network in the Swiss Romande demonstrates how cooperation on the establishment of data banks and common treatment protocols, for example, is indispensable in a medical sector where the major concern is the lack of donor organs. The geographical distribution of transplants is managed as follows: liver, pancreas—small intestine in Geneva, heart-lungs in Lausanne and kidneys at both sites. It should be noted that Geneva is the only place in Switzerland where liver transplantation for children is available.
The Vaud-Geneva Association

The aim of the Association is to put into place reference centres (clinical and academic) to maximise the efficiency, distribution and costs of leading-edge medicine. Amongst the many projects a wide variety of fields are covered such as rare diseases, paediatric heart surgery, neurosurgery, psychiatry of old age, and cochlear implants.

Medical Collaboration in the Swiss Romande

The Faculty of Medicine provides postgraduate theoretical education to specialists within all the clinical departments of the HUG. Together the institutions have built links with medical structures in other Swiss cantons. Many senior staff from non-university hospitals in the French- and Italian-speaking regions of the country hold the position of Titular Professor at the Faculty of Medicine and participate in undergraduate and postgraduate training.

Centre for Biomedical Imaging (CIBM)

Founded by 5 institutions in the Lake Geneva region (UNIGE, UNIL, EPFL, HUG and CHUV), the Centre houses the most sophisticated equipment in the field. It is open to the entire regional scientific community and aims to increase synergies between the founding institutions through one structure and thus optimise technological, human and financial resources. CIBM focuses on magnetic resonance imaging, phase contrast tomography, radioactive isotope functional imaging, three-dimensional electroencephalography, etc. The approach is based on state-of-the-art signal processing.
The University of Geneva Faculty of Medicine is open to the world; it is one of the keys to its academic reputation. Cooperation agreements have been signed with universities in many countries and numerous projects have been carried out. Training specialists in medical faculties in developing countries has meant that the Faculty has become an agent for change while fully respecting its partners’ autonomy. Through the International Cooperation Commission and the Humanitarian Affairs Commissions of the HUG, the Faculty promotes projects in both research and training. There are activities in Armenia, Bosnia-Herzegovina, Cameroon, Eritrea, Lebanon, Lithuania, Mali, Morocco, Mongolia, Nepal, in the Indian Ocean, Romania, Rwanda and Vietnam. Sixth-year students who have obtained the Certificate in Tropical Medicine and International Health are eligible for a two-month course in one of those countries. Every two years, the Faculty collaborates with the Geneva Health Forum which attracts over a thousand participants from every continent.

**international & humanitarian**

**cutting-edge research** in many fields of fundamental medicine: (neurosciences, genetics, biomorphology, vaccinology, etc.) and in clinical medicine (infectious diseases, neurology, angio-haematology, etc.);

**teaching** of fundamental medicine, clinical medicine and public health with partners in developing countries;

**new information and communication technologies** in support of work with countries of the South (e-learning and telemedicine);

**partnerships with international organisations** such as the World Health Organisation (WHO), the International Committee of the Red Cross (ICRC) and the International Federation of Red Cross Societies (IFRC).