The Faculty of Medicine in Hradec Králové

The oldest institution of higher education and rapidly developing scientific organisation in the East Bohemia region
The Faculty of Medicine in Hradec Králové is the leading institution for education and research in East Bohemia and belongs in the ‘top ten’ medical scientific and educational organisations in the Czech Republic. The faculty was established almost immediately after the end of World War II (13 October, 1945) as part of Charles University. Since its foundation, the faculty has undergone extensive development.

Almost 1,700 Czech and 300 foreign students are enrolled in undergraduate fields of general medicine and dentistry at the Faculty of Medicine. Postgraduate study is organised into 20 accredited fields, in which nearly 250 students are enrolled.

The institute pays special attention to scientific research that takes place at more than 40 scientific establishments and covers a very wide range of biomedical disciplines from theoretical, preclinical and clinical disciplines to co-operation with the commercial sector.

The main research fields include:

› Lifestyle diseases affecting the cardiovascular and gastrointestinal system;

› Oncology and hemato-oncology; and

› Ageing and related health problems including studies of regeneration at different levels.

Research in each area is extensive and includes processes from the molecular and cellular level up to the clinical study level.

**International collaboration**

In recent decades, the Faculty of Medicine has developed its research teams, which are now among the most important, not only in the Czech Republic, but in Central Europe as well, as a result of its long-term international co-operation.

The success of the medical college’s research is also evident from its scientific co-operation with other institutions, including Charles University Prague, the Faculty of Pharmacy in Hradec Králové, the Faculty of Military Health Sciences, University of Defence in Hradec Králové, University Hospital in Hradec Králové and the Faculty of Science (University of Hradec Králové). University Hospital is one of the largest in Central Europe and provides a basis for clinical research. The geographic proximity of Prague makes it easier for the institute to focus on projects of the Academy of Sciences of the Czech Republic and other medical faculties.

The Faculty of Medicine maintains a close partnership with other scientific research institutions in Europe and the United States. Of these, the most significant is the collaboration with the Mayo Clinic, Rochester, USA, which has hosted undergraduate and postgraduate students on long-term internships for almost 20 years running.

**Funding**

The faculty’s research teams have contributed considerably to research projects of the EU’s sixth and seventh framework programmes, along with the International Visegrad Fund.

The main source of funding at the medical faculty comes from government agencies (such as the Ministry of Health and Ministry of Education), as well as the Academy of Sciences of the Czech Republic and the resources of Charles University.

The expansion of research activities have led to the need to create a new space for science and education. In 2015, the new faculty campus will open and will provide new surroundings for education, science and research.

Currently, the Faculty of Medicine is preparing for the new planning period and projects in the upcoming framework programme, Horizon 2020. Indeed, it is not only able to offer modern fully equipped research laboratories, but high quality research teams, which demonstrates a long, successful history of achieving results. Consequently, the faculty is a potentially interesting partner for research in the future.
Introduction to the Faculty of Medicine in Hradec Králové

The Faculty of Medicine in Hradec Králové was established as the first of the new medical faculties which followed the end of World War II and became a part of Charles University, the oldest university in Central Europe and north of the Alps.

The city of Hradec Králové is an historic and cultural centre of Eastern Bohemia. The city has more than a thousand years of history, during which it has become an important centre of learning and education. The fact that the city is easily accessible from Prague is a great advantage for the development and co-operation with other educational and scientific institutions that are outside of Czech Republic.

Hradec Králové is a unique and pleasant city for many reasons: the beautiful historical centre, the sheer volume of schools and educational institutions, the development of new science and research facilities and excellent infrastructure to name but a few. In addition to the medical faculty and the high quality University Hospital, there is also the Faculty of Pharmacy of Charles University, the Faculty of Health Sciences University of Defence and the University of Hradec Králové. All these facts provide an excellent environment for the development of university education and conditions for students, researchers and other partners in the field of science and research.

Undergraduate education

The Faculty of Medicine provides a high standard of quality teaching in undergraduate and postgraduate studies. Students are taught in both Czech and English, helping to produce a level of education which is internationally recognised. Undergraduate education includes two master’s degree programmes: general medicine and dentistry. Indeed, the faculty places a strong emphasis on the quality of undergraduate education.

Currently, there are 1,700 students involved in Czech language studying programmes and 300 students involved in English language courses.

This study covers the entire spectrum of theoretical, preclinical and clinical subjects, with over 20 departments situated within the historic buildings and modern training centre, located around University Hospital Hradec Králové, one of the leading university hospitals in Czech Republic.

The faculty’s innovative curriculum emphasises modern teaching methods, a solid grounding in the sciences and regular clinical experience.

Postgraduate education

PhD study again takes place in both the Czech and English languages, with a total of 20 different study programmes. Postgraduate studies include both
theoretical and clinical disciplines, with a basic study period of four years. Students are expected to perform tasks relating to research and to also participate in teaching undergraduate students. During their studies, the students are encouraged to independently manage and prepare a science project and submit an application to the grant agency for its support.

Students become a part of scientific research teams; involved in organising and conducting their own research, presenting their results at international meetings and in internationally recognised scientific journals. They will also have the opportunity to attend international scientific internships during their study.

The Faculty of Medicine does not only attract scientific internship graduate students from the Czech Republic, but also from foreign countries throughout the world. The development of such international scientific co-operation, opens the medical school to new projects, and as a result allows the intensity and importance of this co-operation to increase.

The Faculty of Medicine in Hradec Králové is an active member of the international organisation ORPHEUS (Organisation for PhD Education in Biomedicine and Health Sciences in the European System).

Each year, the institute organises an international postgraduate medical student conference, usually attended by winners of national postgraduate awards from other European countries. A number of past students have now found work at medical schools or teaching in hospitals and the faculty is proud to have so many students working in leading scientific institutions, not only in the Czech Republic, but also in top-ranking foreign scientific institutes.

Like undergraduate students, graduate students also have access to regular scientific internships in foreign educational and scientific institutions. Indeed, each year students have the chance to partake in three months of study and research visits abroad; and the faculty has held a long running partnership with the Mayo Clinic in Rochester, USA, for several decades. Similarly, there is the exchange of students with other scientific institutions in the Czech Republic and Europe. Students are selected for these visits by the results obtained in the study and their scientific activities.

In co-operation with University Hospital, the Faculty of Medicine in Hradec Králové organises further medical education in a specific aspect of medicine, by allowing students to complete a multiple-year residency in order to become a medical specialist. The institute provides training in 42 medical specialties, which are fully accredited by the Ministry of Health of the Czech Republic.
Excellent research
The faculty focuses on excellent biomedical research in the theoretical and clinical fields of medicine and its research is certainly multidisciplinary: including basic scientific research, clinical research and co-operation with research and biotechnology organisations in the region, as well as the wider country. The main aim of the faculty is to integrate all areas of research.

Its research targets the most important problems of Czech and world medicine – ageing populations and the associated health complications leading to an increase in the number of patients suffering from lifestyle diseases and the need for rational use of funds to cover healthcare. For these reasons there is a need for intensive, effective, and comprehensive research in this area.

The research focuses on four main elements in which the Faculty of Medicine in Hradec Králové has had a long and successful tradition:

› Civilisation diseases (focus is given to cardiovascular and gastrointestinal system, diabetes mellitus, etc.);
› All aspects of ageing including studies of regeneration and nutrition;
› Oncology and hemato-oncology; and
› Personalised medicine, including new diagnostic procedures.

According to data from government registries, The Faculty of Medicine in Hradec Králové is among the largest scientific institutions in the country. With nearly 450 scientists and 250 PhD students and an annual research spend of nearly CZK80m (~€3.2m), the institute has one of the Czech Republic’s largest single-site concentrations of research in biomedicine.

Research is an integral part of the work at the medical school and covers a wide spectrum from purely theoretical disciplines up to clinical disciplines. Many projects are conducted together with leading Czech and international scientific institutions.

A significant amount of research on the Medical Faculty in Hradec Králové is conducted in close collaboration with other partners, including the University Hospital in Hradec Králové. This hospital is one of the leading and largest university hospitals in the Czech Republic and provides super-specialised care to their patients in virtually the whole range of medical specialties. This hospital is equipped to the highest level and with a number of leading national medical specialists that are employed by the hospital.

Another important partner is the University of Defence – Faculty of Military Health Care Sciences and both institutions have been working together for decades. Their joint research covers the fields of biology, physiology and toxicology. Other research partners include the Faculty of Pharmacy in Hradec Králové and University of Hradec Králové.

In the field of applied medicine and the commercial sector, the Faculty of Medicine, is working with biotech companies in the region, not only for research purposes, but also to educate young scientists. The excellent results of this scientific collaboration led to the grant of patent protection.

Research funding
The main source of the funding comes from the faculty’s research projects, which are covered by the grant agencies. There are three main grant agencies for biomedical research: the Czech Science Foundation (GACR), the Internal Grant Agency of the Ministry of Health of the Czech Republic (IGA MZCR) and the Grant Agency of Charles University (GAUK). Some projects are...
supported by research grants from the Ministry of Industry and Trade of the Czech Republic (MPO) and the Ministry of Defence of the Czech Republic. Charles University plays an increasing role in institutional support, providing help for the research projects PRVOUK and UNCE (and support for the university centres).

**Research activities – past, present and future**

Co-operation on projects supported by the European Union accelerated the development of new research capacity and the establishment of the new research teams. These funds were used for the construction and instrumentation of new capacities for teaching young doctors and scientists. On the basis of these European projects, old equipment was modernised. The Faculty of Medicine in Hradec Králové considers it vital to create high quality international research teams.

Therefore, the faculty promotes the exchange of researchers between the heads of scientific institutions in the Czech Republic and the rest of the world. The faculty also supports the stay of their scientists and students on long-term research stays. Similarly the Faculty of Medicine supports the activities of leading international scientists in their departments.

**International projects in science and research**

Participation in the European research projects brings new opportunities for the institution. Within the Sixth Framework Programme, the faculty participated in solving an array of international projects (the Multi-National External Quality Assay programmes in Clinical Molecular Diagnostics based on Performance and Interpretation of PCR assay methods including dissemination and training and project HealthCARE by Biosensor Measurements and Networking).

Within the Seventh Framework Programme, the Faculty of Medicine was involved in the project PurStem (the utilisation of the mesenchymal stem cell receptome for a rational development of uniform, serum-free culture conditions and tools for cell characterisation).
Currently, the Faculty of Medicine in Hradec Králové is involved in another FP7 project – OPTIMISE (Optimization of Treatment and Management of Schizophrenia in Europe), involving 20 partners from 13 European countries.

Within the European Social Fund (ESF) the faculty has been successful in obtaining funds from various programmes. Education for Competitiveness supported projects including:

› Physi-Sci-Net (network for the improvement of human resources for research and development through further training of workers and improvement technical support); Mefanet (standardisation and sharing of educational platforms amongst medical schools), HEPIN (Hepatology Institute);

› IT-MEDIK (innovation and development of the study programme of general medicine through the application of information technology);

› NEUROSCIENCES (a project supporting the research in the field of neurosciences in co-operation with Czech Academy of Sciences);

› CEPIN (Center for Innovation in Medicine); and

› The POST-DOC I and II projects (which support the research of postdocs).

The ESF supports projects of the operational programme Research and Development for Innovations and the Faculty of Medicine in Hradec Králové received funding for its own projects, which included MEPHARED (Teaching and Research Center of Charles University in Hradec Králové), MOTUL (the reconstruction and modernisation of buildings the Faculty of Medicine in Hradec Králové) and PRE-SEED (support of the activities for granting patent protection).

Indeed, the faculty is also involved in activities which are supported by the International Visegrad Fund.

Currently, we are finishing the construction of a new teaching, research and scientific facility MEPHARED (Teaching and Research Center of Charles University in Hradec Králové). With this project, the faculty will receive a total of 6,832m² of newly constructed floor area for teaching and research.

The new facility will expand the existing current requirements for education, science and research and the aim of the university is to implement a project to improve the quality of study and research and to ensure maximum results linking its activities with the business application area.

The first part of the teaching and scientific research complex will open in September 2014.

At present, the faculty is now preparing its participation in the upcoming framework programme, Horizon 2020.
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› Oncology and hemato-oncology; and
› Ageing and related health problems including studies of regeneration at different levels.

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