

University Unit Evaluation Report

Second Faculty of Medicine

1. Unit-specific Research Report

Second faculty of medicine was founded as a faculty of Pediatrics, and paediatrics is still very important focus of many research areas at the faculty.

As outlined in the Bibliometric support to the CUNI evaluation, the publication activity of all faculties of medicine of CUNI is quantitatively comparable. When normalized to the number of researchers, the relative output of all five faculties of medicine is comparable, approx. at one half of the value of the comparable benchmark universities.

The most important research areas in terms of quantity and quality of output as well as research resources invested in it are the following:

1.1 MED: Medicine and Medical Disciplines (Basic Medicine, Clinical Medicine, Other Medicine and Health Sciences)

CARDIOLOGY AND CARDIAC SURGERY

As discussed in the Research Area Report, the Children's Heart Centre led by prof. Janoušek is the only national centre for paediatric cardiology and cardiovascular surgery. The institution has a large number of patients and unique clinical competence in this field in the Czech Republic. The clinical standard of care is considered to be excellent by the medical community.

In adult cardiology, the academic strength and focus of 2.LF is hypertrophic cardiomyopathy, particularly alcohol septal ablation. The cardiology department, has published quite successfully, including high impact journals such as the European Heart Journal. Over the last several years they have published approximately 9 to 16 papers annually, mainly in low and medium factor journals.

The rating of the scientific productivity overall, however, is quite low. With an H-index of 16, this group is – with some exceptions mentioned above – not competitive internationally, although the index grew over the last several years. There is no clear research leader and the number of manuscripts published is low; based on a review of publication metrics, this department has decreased scientific productivity and has not built a significant reputation.

Grade C+

CLINICAL NEUROLOGY

Analysis of the top 10% of papers in Clinical Neurology shows that one third of all the papers from CUNI stem from the 2. LF (35 papers). Eight papers from 2.LF were published in highly prominent journals. It is noteworthy that six of the eight papers have either a first and/or last author from 2.LF, which is the most successful faculty in this field.

Interestingly, in the 2.LF, there are two researchers who are part of a larger consortium (EuroEPINOMICS RES) that produced 13 top 10% papers.

Grade B

ENDOCRINOLOGY & METABOLISM

2.LF (together with 3.LF and LFHK) closely follows the primacy of 1.LF in this research area within CUNI, focusing on paediatric endocrinology. Key personalities are prof. Ondrej Cinek (H-index 29) and Jan Lebl (h-index 27)

Grade C+

NEPHROLOGY

Paediatric nephrology research is spearheaded by Prof T. Seeman, who has an international reputation.

Grade B

OBSTRETICS & GYNECOLOGY

The Second Faculty of Medicine focus on prematurity, and gynecologic oncology. The university has a very similar number of publications per author and high quality papers per author as the leading universities in Europe. Research does not appear to have a primary emphasis in the Departments of Obstetrics and Gynecology. There are opportunities of collaboration between the strong genetics research at Charles University and obstetrics/gynecology.

Grade C

ONCOLOGY AND HEMATOLOGY

As stated in the Research Area Report, the bibliometric analysis singles out the excellent research of the Childhood Leukaemia in Prague group (CLIP) headed by Professors Jan Trka and Jan Stary. These investigators consistently publish excellent papers in high impact journals. The Centre combines first class molecular biology research with advanced clinical investigation and is very successful in attracting and training PhD students and young investigators. The same group is very successful in attracting outside grant support: 28 (31%) of the grants and 5.4 million euro (38%) of the funding was obtained by this centre in the time period under evaluation.

The cooperation with pharmaceutical company Sotio in the area of immunotherapy of prostate carcinoma and other malignancies leads to some very promising treatment options (prof. Bartůňková, prof. Špišek, Dr. Fučíková).

The researchers in this area also contribute considerably to the overall research output of the whole faculty. 2. LF had a ratio of 0.76 D1 papers per member of staff. There were 44 papers in the D1 region with a high impact factor that were authored by 22 members of staff classified in the haematology sub-field.

Grade A

PSYCHIATRY AND SEXUOLOGY

Psychiatry at the 2nd Faculty of Medicine has an emphasis on child psychiatry, with a research emphasis on child autism.

Grade C+

SURGERY

In the area of surgery, almost one third (32%) of all the D1 and Q1 outputs are produced at 2.LF, with 18% of senior authorship of these papers comes from 2.LF. The following are a recommendations that address the relative paucity of quality publications by most clinical and especially surgical departments. Most clinicians are usually paid by a fee-for-service arrangement, with a large patient workload, therefore it leaves very little time for quality research. In order to rectify this, the funding model needs to change to at least partial hard funding, along with protected research time. The curriculum of residency training should include compulsory research time, as is done in North America. Each resident should be expected to produce several projects over their training, with view to publication. This has a "trickle up" effect of increasing overall output of clinical/surgical departments and also cultivates further research productivity.

Grade C

1.2 SCI: Biology (Experimental Biology)

In terms of the number and quality of outputs, PrF leads among all units, but the 2. LF (together with 1. LF and MFF) follows.

PrF and **2.LF** follows CTS in numbers of the highest share of AC outputs in the 1st quartile. Prof. Milan Macek and prof. Zdeněk Sedláček are internationally visible personalities in the field of rare genetic diseases (cystic fibrosis, Huntington disease and others).

On the less positive site, **2.LF** has high level of publications in LFPI, and 1.LF) in non-AIS journals.

Grade C+

1.3 SOC: Psychology

The ratio of outputs with impact factor (AIS) in the research area of Psychology is in the 2. LF higher than at other faculties. With rather low number of researchers in the field, they have a large number publications in Journals with AIS. Publications in psychology appear similar to those in medicine, with more emphasis on the bibliometric characteristics of journals than publications in humanities.

Grade B

Top researchers from the Second Medical Faculty

The researchers of the Child Leukemia in Prague (CLIP) group are not only leaders for their faculty but also for biomedical research in all of CUNI. Jan Trka (h-index 34), Jan Starý (h-index 44), Ondřej Hrušák (h-index 26) belong to the most cited researchers of 2.LF and CLIP represent a role model in biomedical research at CUNI. They perform original research with multiple international institutions and collaborators, but they also maintain their own distinct research contribution.

The group working on complex study of epilepsy represents a good mixture of basic and clinical research (Pavel Kršek h-index 20, Vl Komárek h-index 21, Petr Marusič h-index 20) presenting a good publication profile and excellent clinical competence.

From 2.LF, the group of Prof. Pavel Seeman from the Department of Paediatric Neurology published papers in Brain and J. Neurol and Neurosurgery, with the first author from their Institute. Prof. Seeman is a leading researcher in the 2.LF in his research area.

Dr. Tomas Seeman from 2.LF has a number of publications in pediatric nephrology, including on hypertension in childhood and on paediatric disorders.

In pediatric endocrinology, key personalities are clearly prof. Jan Lebl (H-index 27) and prof. Jan Cinek (H-index 29), in molecular genetics prof. Milan Macek (rare diseases, cystic fibrosis – H-index 35) and prof. Zdeněk Sedláček (genetics of neurodevelopmental disorders, including Huntington disease).

2/ Organisation, internal structure of the unit and major research directions

Research directions:

The 2. LF is traditionally focused on research and teaching in paediatrics. It was established after the war as the faculty for paediatric medicine to distinguish itself from the 1- LF. The focus on paediatrics is still present in the research agenda of the faculty.

Another general point to consider when evaluating research at 2. LF is the fact that it operates in close collaboration with the Motol Hospital, the largest hospital not only in Prague but probably in Central Europe, with a major paediatric component.

As stated in their self-evaluation report, the objective of 2.LF in research is to concentrate on a limited number of selected fields proven to be internationally competitive while keeping a high standard in the majority of other fields. This strategic decision seems to be truly followed specifically in paediatric molecular haematology and oncology, neurosciences with respect to epilepsy, paediatric endocrinology and paediatric and adult cardiology.

The EPIREC research centre, joint clinical and research centre with the Academy of Science seems to be a very promising step. An attempt to build a new group of experimental neuroimaging (Dr. O. Novák) with excellent international connections has great potential.

Infrastructure:

There is no central core facility, with the key technologies shared among the research groups on a friendly basis or based on specific cooperation. Importantly, there is no animal facility, which is a major disadvantage for current biomedical research. The board understands that an animal facility is planned for the newly prepared faculty building.

Furthermore, in February 2021 the faculty is planning on opening a new Department of Bioinformatics, which is a spin-off of one the genomic-oriented research teams. This department will create interesting opportunities for synergy within and outside the faculty.

Organisation:

The faculty introduced in 2011 a novel scheme called Institutional Support of Excellence (IPE), which is primarily targeted to excellent teams with a number of postdocs to cover their personal expenses. The applications are selected by an external expert panel. According to the self-evaluation report, this scheme now supports five research teams, representing the majority of their most competitive research fields.

On a less positive note, the research organisation structure seems to be rather fragmented, as it follows the organisational structure of the Motol hospital and faculty departments, and heavily depends on a few leading research personalities and their success in grant applications, while the key

leading positions (Heads of the Departments, Heads of the Units etc.) are primarily concerned with clinical care and may not stimulate clinical research.

3/ International collaboration and visibility

Professors Jan Stary and Jan Trka from CLIP can be pointed out as internationally recognised scholars, as well as other individuals listed above.

The self-evaluation report includes 10 persons serving on editorial boards of international journals; invited lecturers in both directions (~10 examples provided); and 10 examples of significant membership in international societies.

According to the self-evaluation report, the internationalisation of study and research progresses only slowly, perhaps mostly due to official regulations (until recently, international graduate student could not apply for positions of the scholarship from the University, which effectively froze their admission). Since this regulation was lifted the faculty has seen an increasing number of international applicants.

Collaboration

As stated in the self-evaluation report, the faculty is an active member in number of international projects and consortia such as EuroFlow, EuroMRD and EuroClonalityNGS and in EpiCARE . The faculty members are board members of the European Society of Paediatric Endocrinology, Association for European Paediatric and Congenital Cardiology, Union of European Medical Specialists - Section Pediatric Surgery, European Society of Human Genetics, and they have a current President of the International College of Angiology

The faculty has a bold plan to make English the second official teaching language, which would surely attract more academics and improve not only the level of teaching but also science.

Major international grants

There were 7 international projects, most of them from EU institutions, 2 of them H2020,. However, no project has a PI from the faculty. The total income from international projects is rather modest. In addition, these is some contracted research for foreign agents.

Recently, a young fellow from the CLIP centre obtained a prestigious grant from the American Society of Haematology.

It is notable that there is not a single grant from the ERC for a faculty member.

4/ Environment for junior researchers and PhD students

Specific programs and recruitment.

PhD's participate in programmes organised jointly by the three Prague's medical schools, Faculty of Science and Academy of Sciences.

The PhD program is strong in genetics, neurosciences and leukemia/oncology, as these areas include researchers from different faculties.

The faculty organizes a Scientific Conference for PhD students, a rather unique event with international presence and quite a high level of quality. The mandatory participation of the students in the third year of their PhD facilitates the control of progress of the particular students throughout the final phase of their graduate studies.

Separate scholarships for the fifth year for selected students in MD/PhD programme runs in collaboration with FNM (approximately 5 to 10 students yearly). A few students are sent for international experience.

For the support of young researchers and PIs, the faculty uses university programs (PRIMUS, UNCE) and indeed, several promising young investigators got the support and started independent research careers (children haematology/oncology group, neurology, molecular genetics and etc). More effort should be invested in recruiting young promising investigators from abroad bringing in new ideas and concepts.

In their self evaluation report, the faculty state that a limited research budget makes it quite difficult and almost impossible to recruit new PI/Research groups from other institutions. The panel believes that more need to be done even in the current budgetary environment.

5/ Overview of research outputs

As detailed above, the faculty makes significant effort to identify its area of interest and strives to provide additional support for them. The Child Leukaemia in Prague (CLIP) group, the EpiRec center, neurology and children cardiology groups seems to be well establish internationally and reach good European standard, comparable to benchmark universities.

6/ Strategic planning

The building of new facilities of the faculty in Motol needs to be carefully planned and used to create an environment for selected young investigators rather than just to improve the lab space and conditions for existing groups. Establishment of central facilities and every effort invested in bringing new scholars with international expertise would be highly recommended.

7/ Recommendations, summary

The board suggests that internationalization of the research staff of the faculty be increased. Utmost effort must be made to bring in talented new and also senior researchers from outside the university. Much better use of the Primus program as well as national grant schemes for young researchers (GACR Junior grant and others) should be pursued. The faculty should pursue an international standing of 2. LF and should have multiple recipients of renowned international grants such as ERC Starting or Consolidator grants.

The PhD program is quite clearly too fragmented. It needs to be concentrated to several programs so that the intellectual capacity and other resources of the faculty/CUNI are appropriately used.

Considering the sub-optimal financial resources, the workload in teaching and clinical duties of academic staff, the overall research output of the Medical faculties of CUNI is remarkable. There is a potential for improvement to match with benchmark universities. The panel presented general recommendations valid for all five medical faculties:

- Increase amount of institutional grants to allow long term strategic planning of research programs by financing postdocs and PhD's
- Funding model for clinicians, i.e. surgical disciplines needs to change to at least partial hard funding, along with protected research time. The curriculum of residency training should

include compulsory research time,. Each resident should be expected to produce several projects over their training, with view to publication. This has a "trickle up" effect of increasing overall output of clinical/surgical departments and also cultivates further research productivity.

- Stimulate collaboration among the five faculties focusing on multi-centre studies, i.e. RCT's
- Introduce systematic training in research methods (study design, data analysis) and in writing grant applications and scientific publications for PhD students and junior members of staff to improve the quality of research and publications.
- Stimulate and reward participation in international research activities and European projects with Czech scientists in leading positions.
- Award high quality publications in Top 10% AIS Journals. Quality above quantity.

The system of five Medical Faculties in one University is unusual and unique. Advantages of this system include the ability to pool resources and patient populations, as in the Prague Trials. Disadvantages include the difficulties of organization of long-term research. For long-term research strategy it is questionable if this system is justifiable. One Research Advisory Board for all five faculties might be more efficient. The advisory board could identify central core units, identify areas of expertise, and identify novel clinical research questions that Charles University is in a good position to study. It is especially important to identify areas which are unique to Prague, in order not to compete with other much richer research groups. The evaluation panel feels that this description will be in vain if it is not used to co-design novel research strategies and increase funding appropriately.