**Evaluation of Research Fields/Areas**

***Medicine, v. 2021.01.26***

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Preamble:

The Czech Republic has eight medical faculties to care for its 10.5 million inhabitants, with five of them belonging to Charles University. Of 2 pharmaceutical faculties in the Czech Republic, one belongs to the Charles University and is located in Hradec Kralove. Three of the medical faculties of Charles University are located in Prague, while one is located in Pilsen, a middle-sized city in the south west of the capital and another is located in Hradec Kralové, which is to the east of Prague. This organisation is unusual in Europe and provides opportunities for multicentre studies, as reflected by the successful Prague Trials. Each of the five medical faculties of Charles University are associated with a large tertiary carehospital, although the faculty and hospitals are legally two different institutions. Thus, a lot of research, is not only done under the umbrella of the medical and pharmaceutical faculties or the University, , but also at the University hospitals and in some cases affiliated hospitals such as the Thomayer Hospital in Prague. Academic careers at Charles University characteristically start with medical or pharmaceutical studies culminating in a degree as a medical doctor or master of pharmacy, followed by PhD programs for those pursuing an academic career. The next step is Associate Professor, and the highest academic degree is Full Professor. Such a professorship may or may not be associated with a leading position within the hospital. Research funding within the Czech Republic is not at the level of many other European universities, resulting in limited research funding for researchers.. Indeed, the salaries for post-doctoral fellows are barely enough to cover living expenses. Although some research teams collaborate with European and even American centers and may apply for European funding, national funding is suboptimal andsignificantly below benchmark institutions in Europe. Increases in funding should be seriously considered in the future to help medical research in the Czech republic to remain, and in some cases become, competitive. A specific analysis of this issue is mandatory, as funding provides the foundation for research.

Process:

The Rectorate of the Charles University (CUNI) invited international experts to assess the research outcome of the CUNI medical faculties. The panel included:

Joerg W. Bartsch, PhD, Professor, Philipps University, Marburg, Germany, WoS H-index 30, i10-Index 46, citations 2896

Anthony Bleyer, MD, Professor, Wake Forest School of Medicine, Winston-Salem, NC, US WoS H index 33, Google scholar H-index 53, i10-Index 108, citations 5,633

Bobak Martin, Professor, University College London (UCL), London UK, WoS H-index 53

Dela Flemming, PhD, Professor, University of Copenhagen, Denmark, WoS H-index: 57, Citations: 12506

**Jiri Dvorak, PhD, Professor, Chair**, Schulthess Clinic and University of Zurich, Switzerland, WoS H-index 74, Google scholar H-index 118, i10-Index 383, citations 53117

Danijel Kikelj, PhD, Professor University of Ljubljana, Slovenia, WoS H-index 24, Google scholar H-index 28, i10-Index 85, citations 2911

Vladimir Kratky, BSc, MD, FRCSC, DABO, Associate Professor, Queen’s University, Kingston, Canada; Google scholar H-index 12, citations 433

Zdravlo Lackovic, MD, PhD (DrSc), Professor, University of Zagreb, Croatia

Lüscher Thomas, MD, FRCP, FESC, Professor, Imperial College in London and University of Zurich, Switzertland, Google scholar H-index 128,

Misfeld Marin, Professor, University Clinic of Cardiac Surgery, Leipzig Heart Center, Leipzig, Germany andDepartment of Cardiothoracic Surgery, Royal Prince Alfred Hospital, Sydney, Australia, H-index 41, Citations 5697

Anthony Moorman, BSc, MSc, PhD, Professor, University of Newcastle, GB, Google scholar H-index 63, Citations 14748

Jan Pecenak, MD, PhD, Professor of Psychiatry, Faculty of Medicine, Comenius University Bratislava, WOS H-index 10, citations 441

Methodology:

The panel members received following documents:

* Bibliometric Support for Evaluation of Research at Charles University 2014-2018
* 93 selected outputs provided by the individual medical faculties
* Web of Science auxillary comparative reports for medical subfields
* List of all publications / outputs during the evaluation period
* Self-evaluation of the faculties prepared for the Rectorate
* Self-evaluation of the faculties prepared for the Ministry of Education

The panel participated in several ZOOM meetings from November 2019 to November 2020 to develop the method of assessment of the outputs and the ratings for comparison with benchmark universities. On June 24, 2020 a ZOOM meeting with the Deans and Vice-Deans of the medical faculties was held to answer additional questions from the panel. In September 2020 the draft of the evaluation report has been presented to the Faculties for feedback and on 1. And 2.October 2020 The Chair and the Panel had virtual meeting with the Facultie representatives including postdoc and PhD students. The panel focused on the research output from all Medical faculties and Faculty of Pharmacy HK related to subfields or Flagships of medical sciences. The individual evaluation of the six faculties is presented in separate documents.

According to their individual expertise, panel members were assigned to assess in depth the output of previously identified “flagships” of the CUNI medical faculties. Due to the Covid-19 pandemic, site visits were not performed, resulting in some limitation.

**Executive Summary**

The Czech Republic has eight medical faculties to care for its 10.5 million inhabitants, with five of them belonging to Charles University. Of 2 pharmaceutical faculties in the Czech Republic, one belongs to the Charles University and is located in Hradec Kralove. Three of the medical faculties of Charles University are located in Prague, while one is located in Pilsen, a middle-sized city in the south west of the capital and another is located in Hradec Kralové, which is to the east of Prague. This organisation is unusual in Europe and provides opportunities for multicentre studies, as reflected by the successful Prague Trials.

Although some research teams collaborate with European and even American centers and may apply for European funding, national funding is suboptimal and significantly below benchmark institutions in Europe. Increases in funding should be seriously considered in the future to help medical research in the Czech republic to remain, and in some cases become, competitive. A specific analysis of this issue is mandatory, as funding provides the foundation for research.

Overall assessment of publication output was based on bibliometric analysis provided, and the panel used quantity/quality index – papers / author / above 50% AIS, papers / author / below 50% AIS, and Top 10%, P/A.

Comparing with benchmark Universities the CUNI authors in medical and health sciences publish similar total amount of papers per author, however they are lower in publications in upper 50% of Journals AIS, and higher in bottom 50% of AIS Journals, many of them publisherd in Czech language. It could be assumed, that, taking quality of publishing as a measure, the quality is below the European benchmark universities. 724 papers were published in Top 10% of AIS Jounals. The publication of 42 papers in NEJM and Lancet is a considerable output, even though statisticaly only half of the papers published by benchmark Universities. This does indicate participation in highly important, main stream research, however within the highly impacted papers the Czech authors are mostly in the middle of the multiauthors peers. The future focus should be improvement of the research quality as well as produced papers.

Grade: B

The selected publications for peer review process cannot be considered reliable and could not be used in the evaluation process because less than 1% of outputs were presented to peer review. The number of reviewed papers was too low to enable drawing reliable conclusions from the peer review process and bibliometric analysis.

In assessing the research's breadth, the panel decided to focus on the main subfields, also called "flagships." Papers published in each subfield in the Top 10% AIS Journals were considered for further analysis. For the analysis only WoS Core collection publications were considered as well as WoS categorisation of research field.Eeach paper is inferred from the publishing journal, according to the Journal Citation Reports retrieved from WoS.

For multicentric and multinational studies, the contribution of CUNI authors (first author, last author, second and second last author) was taken into account.

CARDIOLOGY AND CARDIAC SURGERY

All 5 Medical Faculties of Charles University do have Departments of Cardiology and Cardiovascular Surgery with clinically apparently complete services covering the whole spectrum except cardiac transplantation. Academically, however, the picture is quite heterogenous. The by far most visible **Cardiology Department** of international standing in the field of acute cardiovascular care (Prague Trials, Stroke management) is the 3rd Medical Faculty led by Petr Widimsky. Ales Linhart, is the second best rated cardiologist and President of the Czech Society of Cardiology with a different research focus, i.e. cardiomyopathies among others. Otherwise, the scientific productivity is of medium or low ranking, even in Department focussing only on research. Indeed, a significant part of the citations of other faculty leaders comes also from the *Prague Trials* rather through genuine scientific productivity.

**Cardiovascular Surgery** is much less strong. In general, it appears that only two cardiac surgeons are really active in clinical research, i.e. Peter Kacer, the best cited cardiovascular surgeon with an h-index of 19, followed by Jan Vojacek (h-index 14) and Jaroslav Lindner (with a moderate h-index of 12). The others are probably excellent surgeons, but without international standing.

Another way at looking at the scientific success of the different Medical Faculties is to assess the papers published in high impact journals. The **assessement of publications** of group D1 reveled a total number of 70 publications. These were distributed between faculties as follows: 1. LF: 30 papers, 2. LF: 11 papers, 3. LF: 17 papers, LFHK: 4 papers, and LFPI 8 papers, respectively. Again, this reflects the fact that the 1st and 3rd Medical Faculties in Prague are far above the two others, i.e. the 2nd Medical Faculty Prague and the ones in Pilsen and Hradec Kralové. While in terms of numbers, the 1st Medical Facults looks best in this analysis, considering the **most cited authors**, the ranking looks different: While Ales Linhart of the 1.LF - 1st Medical Faculty looks the best with 329 publications (308 PubMed listed) and the highest citations (see Table 1) citations, in terms of original contributions to the field, Petr Widimsky with 431 PubMed listed publications from 3.LF - 3rd Medical Faculty is clearly the leading figure internationally as the primary investigator of the *Prague Trial* series as he is not a co-author, but the brain behind these trials. From LFPI - Medical Faculty Pilsen, Richard Rokyta (89 PubMed listed publications) is involved in most of the top ten publications from his center. In the faculties 2. LF and LFHK is due to the low number of manuscripts published no clear research leader visible; indeed, these faculties are clearly of a low scientific productivity and reputation.

Obviously, it is of importance to compare the leading academics of Charles University with those of **benchmark universities** in Europe. Thus analysis reveals that Charles University in cardiovascular medicine surpasses Warsaw and is almost comparable to Heidelberg, but below Copenhagen, Milan and Leuven. Thus, Charles University is reasonably positioned, but could further improve its standing in cardiovascular medicine. In particular, it should broaden its productivity beyond the 3rd Medical Faculty and assure international leadership at least also in the 1st and 2nd Medical Faculty in Prague where there is potential. To that end, local research grants fort he next generation should be expanded.

Mentoring of the weaker Medical Faculties would be highly recommended, for instance through a standing international advisory board. Also, as both leaders in Cardiology will retire in some years, the next generation should be looked after at carefully and appropriately supported to maintain the current level of productivity also in the future..Indeed, it is of concern that after the retirement of Petr Widimsky in a few years, the standing may be endangered unless young and productive clinical scientits will follow in his foot steps.

**Conclusion**: The scientific productivity of **Cardiology** at Charles University is very heterogeneous among the different faculties with the 1st and 3rd Medical Faculty being internationally visible and competitive. Cardiovascular surgery is solid and has 3 leaders with modertae to good scientific productivity.

GRADE: A: 1st LF (Ales Linhart) and 3rd LF (Petr Wdimsky)

B: 1st LF (3rd Department of IM; Jiri Widimsky), Thomayer Hospital in Prague (Renata Cifkova), 2nd LF CV Surgery (Jaroslav Lindner)

C: Pilsen (Richard Rokyta and Ivo Bernat)

D: 1st LF, Institute of Physiology, (Otto Kittnar), Biomedical Centre, Pilsen (Milan Stangl), Cardiology Hradek Kralové (Josef Stasek)

GRADE Overall B

CLINICAL NEUROLOGY

Overall, for faculties at CU, there is a good coverage of all areas of neurology, including multiple sclerosis, dementia, dystonia, stroke, epilepsy, and encephalopathies including hypersomnia. Clearly there are flagship expertises such as multiple sclerosis (Prof. Eva Havrdova, Dana Horakova), movement disorders (Evzen Ruzicka) and sleep (Prof. Karel Sonka) medicine in 1.LF, encephalopathies and neuropathies in the 2.LF, and stroke in LFPI.

**GRADE: A**

ENDOCRINOLOGY & METABOLISM

There are several highly productive groups that dominate the CUNI landscape in this field. While it may appear that this is all CUNI has to offer in this area, it should be noted that there are other CUNI researchers who, while producing fewer output, nonetheless achieve high quality research especially via collaborations with other institutions. If the Endocrinology & Metabolism field at CUNI, irrespective of the five faculties individual contributions, should reach higher impact, a re-structure and perhaps merging of faculties (or research groups) may be necessary.

**GRADE: D**

NEPHROLOGY

There are many highly relevant clinical research outputs in nephrology but there is limited basic science research. All areas of nephrology are well covered, with different investigators specializing in research in pediatric nephrology, glomerular disease, hemodialysis, transplantation, and acute kidney disease (Dr. Vladimir Tesar- 1.LF, Dr T.Seeman - 2.LF, Dr. Ivan Rychlik - 3.LF. Maintaining basic science research is often at the expense of clinical research. In terms of publications, the Charles University is highly competitive internationally. Further development of junior faculty should be an important goal.

**GRADE: A**

OBSTETRICS & GYNECOLOGY

The Departments are focused on providing excellent clinical care, with over 5,000 gynecologic operations performed last year. The primary area of research interest of the First Faculty of Medicine is in gynecologic ultrasound. For the Second Faculty of Medicine focus on prematurity, and gynecologic oncology. In the Third Faculty of Medicine, publications are limited. LFHK focused on the placenta and amniotic fluid. 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: B**

ONCOLOGY AND HAEMATOLOGY

There were nearly 1000 outputs in the field of oncology and haematology which were distributed fairly evenly across the faculties taking into account the differences in staff levels. Although there were some excellent papers in discovery journals, less than 20% of this papers were classified as D1. Noticeably, research into the major five cancer types were poorly represented among these D1 papers and given the health burden represented by these cancers this is a disappointing feature. Review of WoS bibliometric data clearly indicated that paediatric leukaemia research particularly in 2LF (Professors Jan Trka and Jan Stary )was a major strengthen of CUNI and can be considered a flagship centre of expertise. With respect to international benchmarks, the field of haematology and oncology CUNI ranks 2nd out of 7 universities but it is last in oncology. This situation is reflected in terms of internal and external grant income of the CUNI oncology and hematology researchers. Overall income is low and appears to be decreasing with time. Income grant to paediatric leukaemia researchers is better but not substantial. On the plus side, we note that several CUNI researchers are involved in several EU funded grants.

**GRADE: Oncology C Haemato-oncology A, combined B**

PHARMACOLOGY & PHARMACY AND TOXICOLOGY

The presence of the subfields Pharmacy, Pharmacology and Toxicology at CUNI is very solid and internationally recognised. However, the Pharmacy and Pharmacology subfield is much more strongly represented than the Toxicology subfield. In Pharmacy and Pharmacology FaF HK is the flagship faculty in the period 2014-2018 (Peter Pavek, Frantisek Staud), whereas the flagship institution in Toxicology (Pelclova Daniela, Sergey Zakharov) in the same period is 1.LF.

In the top 10%  and top half category papers the scientific subfields Pharmacy and Pharmacology and Toxicology at CUNI are below the European leading benchmark universities. An important conclusion from this analysis is that CUNI authors need to improve their visibility in these subfields be aiming to increase publishing in the top 10% and top half journals.

In the Pharmacy and Pharmacology and Toxicology subfields research is frequently carried out within one Faculty or within CUNI collaboration only. Therefore we strongly recommended that these faculties analyze how to foster international collaboration in order to provide added value to their research and limit the prevailing inter-CUNI or national collaboration.

**GRADE: B**

PSYCHIATRY AND SEXUOLOGY

There are 10 D1 articles suitable for evaluation. Three of them are from 1. LF (Papezova, Winkler), all from the department of eating disorders. The main addition to the published studies is providing the genetic material of properly diagnosed patients. The major benefit of participation in these genetic studies for CUNI is the recognition of this department as a reliable partner for international cooperation and co-authoring in highly recognized journals.

All other articles are from 3. LF (Prof. C.Hoschl is a departmental and international leader), and the majority are from authors not primarily affiliated with Charles University (Alda, Hajek).

There are several research fields with both high attractivity and level of scientific work (e.g. MRI in psychiatry, psychotropic substances for treatment of mental disorders). The authors from 1st Faculty have the largest number of publications in general. They cover a broad spectrum of subfields in psychiatry including sexology, there is no a clear leading research topic. Psychiatry in 2nd Faculty of Medicine is oriented to child psychiatry and child autism is recently extremely important field of interest. Faculty of Medicine Hradec Kralove is involved in international teams in publications on genetics and epigenetics in psychiatry. Faculty of Medicine in Pilsen has less research and publication activity in the genetic basis of violence, a rising field of interest. CUNI is comparable to the benchmark Universities.

**GRADE: B**

SURGERY

The academic outputs are on the low side, which creates an inherent inability to evaluate this area in depth. The 1.LF appears to be most productive faculty, and the sub-specialty of General Surgery is the most actively published area (**Tomas Harustiak, Alan Stolz** -1.LF, **Filip Cecka** –LFHK) . The very low level of D1 publications with respect to the other fields in medicine, may be due to insufficient staff that is too busy with clinical activities to pursue publications, and/or there may not be defined research associates with protected research time and could be due to the burden of having to earn a clinical income from seeing patients and carrying out surgeries, which leaves little time for research. Sufficient “protected” research time is key in producing quality research and mandatory for lab bench science (at least 50-70% protected time is recommended for designated personnel to yield significant outputs). This of course means that the funding formula of clinician-researches has to be reviewed and a new model needs to include “hard” money for the research activities.

**GRADE: C**

**Contribution of individual CU units to the field/area development (FORD Clasification)**

Taking into account the headcount of specialised authors/researchers, the output in Basic Medicine on average is more or less equally distributed with slightly higher output from 2.LF and LFPL and slightly lower from FaF HK. However, the latter had a better proportion of higher quality papers.

For clinical medicine, there was higher output of top 10% papers from 1.LF and 2.LF, and lower outputs in top half papers from LFHK and LFPl.

The interpretation of output in Health Sciences is biased with low proportion of major authors shares, which might benefit the average papers/author ratio.

Pharmacology and Toxicology is difficult to interpret as in FORD is included in Basic Medicine and in CUNI as separate field.

**International collaboration and visibility**

The medical faculties in their self-assessment reports presented examples of internationally recognised scholars. The importance of some of these listings is difficult to assess but overall there is evidence that all assessment units are internationally connected and have some degree of international recognition. There are several examples of high calibre individual awards (e.g. Prof Widimsky at LF3 and Prof Svec at FaF HK and Professor Jan Stary at 2LF)), indicating very solid international reputation. Several CUNI academics are editors of high quality journals and further members of staff are members of editorial boards.

Each faculty reported guest lectures of CUNI staff at international universities and vice versa. Each assessment unit also reports receiving funding for international collaborative projects, but the distribution among the 6 assessment units is very unequal. By far the most international projects have been conducted at LF1; the funds raised by the international competitive grants have been also the at 1.LF (2 million €). The collaboration of assessment units outside Prague has been very modest.

An alternative measure of international collaborations, and the importance of CUNI partners in such collaborations, is the proportion of papers of CUNI authors who were first or last authors in scientific papers. Only 21% of papers in D1 category had a CUNI author as first or last author. This share was increasing with declining journal importance, so that 80% of papers published in D4 journals had CUNI authors as first or/and last author. This suggests that in CUNI academics are relatively unlikely to lead the research reported in high quality journals.

While there are members of CUNI staff with good international links and memberships in editorial boards and other bodies, the number of international research collaborations of all assessment units is small. There also is an indication that in most of such collaborations CUNI researchers do not play a leading role.

The low participation in EU research programmes is particularly disappointing. It is difficult to achieve a high successful rate in applications for competitive funding (currently CUNI holds 8 ERC grants) or leading international consortia (80 FP7, H2020 projects, 20 among them are Marie Skłodowska Curie projects) but should be possible to participate as partners in such consortia (H2020, Horizon Europe). This may be a realistic way to build international visibility and recognition. CUNI staff with existing international connections will be instrumental to help their institutions to increase their participation in international projects.

**Environment for junior researchers and PhD students**

All CUNI medical schools and the Faculty of Pharmacy provide PhD training, and there are a number of schemes and some funding additional to the national support for PhD students. Depending on unit assessment, students have opportunities to gain experience abroad, often using the European Erasmus scheme. Most students work with senior researchers or teams. Some faculties operate specific recruitment schemes for recruiting PhD students and (less often) for retaining good students but this is restricted by lack of funding.

However, there is a striking lack of post-doctoral positionss in all assessment units; in 2018, with only 7 postdocs across the five medical schools.

The numbers of PhD students seem reasonably high but the quality of the training and of the research they undertake is difficult to assess. There does not seem any systematic effort to retain the best PhD students at the university. There are very few postdocs in all CUNI medical schools and Faculty of pharmcy; this is possibly related to low retention of good PhD students. While the low number of postdoc positions is probably related to lack of funding, one should consider that even internationally much of the research work often depends on having sufficient number of junior staff dedicated to research (i.e. full time on research). It is unrealistic to expect junior staff employed on clinical appointments to be able to conduct high quality research in their spare time.

The panel recommend to establish one Research advisory Board for Medicine across the five medical faculties to coordinate the effort and stimulate subfield with D1, Q1 outputs and having CUNI researchers in the leading positions and established Postdoc programs.

**FINAL CONCLUSION**

Considering the sub-optimal financial resources, the overall research output of the Medical faculties of CUNI is remarkable. There is a potential for improvement to match with benchmark universities;

* Increase amount of institutional grants to allow long term strategic planing of research programs by financing postdocs and PhD's
* Stimulate collaboration among the five faculties focusing on multi-center 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.
* Stimulate and reward participation in international research activities and European projects.
* Award high quality publications in Top 10% AIS Journals. Quality above quantity.
* Establish links between the faculties and across disciplines to share best practice and peer review grants prior to submission in order to improve success rates. This is particularly important for EU grants.
* Establish centres of excellence across the faculties to leverage top quality research as well as pool resources and facilitates. This will also help to avoid duplication and be more strategic in terms of grant submission.

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.

For future assessment the WoS categories should be used to allow comparison with any University. The self-assignment create confusions.

Additional recommendations

1. The Panel did not evaluate participation in studies funded by pharmaceutical companies, but increased collaboration with industry has the following advantages:
   1. Increased exposure to new medications and technologies
   2. Collaboration in multi-center clinical trials
   3. Exposure to academic leaders in various fields
   4. Financial gain that can be recycled into personnel costs and research.

It is important that the university adopts rules that makes participation in clinical trials financially worthwhile for investigators in terms of either supporting their salary or their research. Each faculty should have an office that alleviates the burden of initiating and performing clinical trials. As funding by governments decreases, industry funding becomes increasingly important.

1. Speaking Czech as a primary language and historically having limited English education leads to difficulties in publishing and submitting grants in English. Faculties should have ample resources available for teaching English as well as assistance in translation for manuscripts and grants.
2. Increasing the international prestige is dependent on the quality of work produced but also on the perception of others. The university should consider a formal approach to this issue. Possible methods to increase international recognition would include:
   1. Holding international conferences, perhaps with sponsoring from the government or pharmaceutical companies.. The university should leverage this to help improve its international recognition.
   2. Branding of clinical trials such as the Prague trials would be extremely helpful.
   3. Regular invitation of thought leaders in various areas to improve relationships and lead to networking and opportunities. Visiting professorships that are standardized and strategically planned to improve collaborations.
   4. Consider forming a board of advisors for Medicine with representatives from leading European universities to learn what is new in these universities and enhance collaboration and networking.
3. **Overall assessment of publication output based on bibliometric analysis**

**The panel decided to use quantity/quality index – papers / author / above 50% AIS; papers / Author / below 50% AIS; and Top 10%, P/A (HC –Head Count/ authors specialised in a field, >50% upper Half of the rating; total P/A- papers /Author, or papers divided by total HC). The data were extracted from the FORD International Report of theMedical and Health Sciences.**

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|  |  | |  | |  | |  | |  | |
| **University** | | **HC** | | **>50%** | | **P/A** | | **<50%** | | **P/A** | | **Top 10%** | **P/A** | **Total** | **Total P/A** |
| CUNI | | 4,579 | | 3,162 | | 0.69 | | 2,867 | | 0.63 | | 724 | 0.16 | 6,029 | 1.32 |
| Heidelberg | | 7,731 | | 9,041 | | 1.17 | | 2,845 | | 0.37 | | 2,530 | 0.33 | 11,886 | 1.54 |
| Warsaw | | 790 | | 503 | | 0.64 | | 338 | | 0.43 | | 72 | 0.09 | 841 | 1.06 |
| Copenhagen | | 8,652 | | 12,012 | | 1.39 | | 2,804 | | 0.32 | | 2,989 | 0.35 | 14,816 | 1.71 |
| Milan | | 6,024 | | 7,795 | | 1.29 | | 3,274 | | 0.54 | | 1,770 | 0.29 | 11,069 | 1.84 |
| Vienna | | 1,052 | | 1,163 | | 1.11 | | 374 | | 0.36 | | 185 | 0.18 | 1,537 | 1.46 |
| Leuven | | 5,645 | | 8,817 | | 1.56 | | 1,854 | | 0.33 | | 2,526 | 0.45 | 10,671 | 1.89 |



**Compared with benchmark universities, CUNI authors in medical and health sciences publish a similar total number of papers per author. However, CUNI authors have fewer publications in the upper 50th percentile of Journals AIS, and more below the 50th percentile of AIS Journals. The proportion of CUNI authors with publications in the top 10% journals (Fc/Ac = 0.126) is lower than that of benchmark universities (average 0.243), with the proportions of Copenhagen (Fc/Ac = 0.314) and Leuven (Fc/Ac = 0.295) being the highest.**

**The percentage of CUNI FC outputs among AC outputs in the top 50th percentil journals was 950/3162 ( 0.30) compared to benchmark universities (Heidelberg 0.38, Warsaw 0.36, Copenhagen 0.40, Milano 0.31, Vienna 0.37, Leuven 0,38; average 0.37), which was slightly lower.**

**In the bottom 50th percentile of journals, the percentage of CUNI FC outputs among AC outputs was 1431/2867 (0.50)compared to benchmark universities (Heidelberg 0.50, Warsaw 0.54, Copenhagen 0.49, Milano 0.40, Vienna 0.41, Leuven 0,42; average 0.46) was slightly higher.**

**With quality of publishing as a measure, the quality of CUNI publications is below the European benchmark universities.**

**There are two important caveats that need to be appreciated:**

**1) Author counts include only those authors who specialize in the field (having more than 30% or the largest share of their own output - see the footnote for each graph). This means that some universities having the large share of authors with a multidisciplinary focus (i.e. publishing in multiple fields), might benefit in terms of P/A in some fields that are not the fields of specialization of their authors, but which exhibit a non-negligible output.**

**2) Author counts do not include non-publishing authors. This, again, might improve the productivity measures disproportionally for those universities where the share of non-publishing authors among all scientists is high. We could not account for this discrepancy explicitly from the available data. However, it could be assumed, that within the reasonably long period of time (5 years in case of CUNI evaluation), a negligibly small share of scientists at all universities did not publish, and thus this consideraton should not affect a P/A ratio of some universities while not affecting others.**

**3)** The P/A ratio does not reflect an individual productivity of researchers, which is typically higher than the number shown on the graph. It is important to note, existence of large internal (within institution) teams will lower the overall P/A ratio of the institution, while individual productivity of researchers can be at a relatively high level. Consider 5 researchers from the same institution producing 10 publications during a year. Individual productivity of each researcher will be calculated as 10/1 = 10, while the overall P/A ratio of the institution will be equal to 10/5 = 2.

**Recognizing these caveats, the Index P/A could be taken as an overall indicator for quantity versus quality of published papers. The average number of citations is roughly comparable with benchmark universities (for CUNI, the number of times cited relative to the average is 1.11 for the top 50th percentile and 0.78 for papers from the bottom 50th percentile). However, the time period is too short to assume the long term impact of many published papers. There were 724 of 6029 (0.12) papers published in the top 10th percentile of AIS jounals compared to Heidelberg 0.21, Warsaw 0.09, Copenhagen 0.20, Milano 0.16, Vienna 0.12, Leuven 0,24. Thus, the CUNI proportion of 0.12 was below the average of 0.17 is lower from benchmark universities). There was publication of 42 papers in the New England Journal of Medicine and Lancet, which was statisticaly only half of the papers published by benchmark universities. However, this publication rate does indicate participation in important clinical research at the highest level.**

**CUNI authors have publications in the top ten percentile of pharmacy journals (J. Med. Chem 27 papers, J. Control Release 5 papers, Med. Res Reviews 2 papers), Pharmacology (Brit. J. Pharmacol. 4 papers) and Toxicology (Arch. Toxocol. 10 papers).**

1. **Quality of the selected publications based on peer review**
   1. **Quality of the peer review process.** Isthe outcome of the peer review process reliable so that it can be used without reservation in the evaluation process?

**It was felt that the quality of the peer review process might be unreliable, as only 93 papers were presented and the risk of bias was not considered. Another system for future evaluation should be evaluated.**

**In the CUNI field Pharmacy and Toxicology, only 3 outputs (scientific papers) out of total 866 outputs (<1%) (data from VEDA portal) were submitted to peer review. Two of these publications were D1 (Top 10% of AIS papers) papers in the field Pharmacy and Pharmacology and the third one was a Q2 paper in the field Toxicology. The outcome of the peer review process cannot be considered reliable and cannot be used in the evaluation process because less than 1% of outputs were presented to peer review.**

* 1. **Comparison with bibliometrics.** Are there substantial discrepancies between the conclusions that can be drawn from the bibliometric analysis and those based on the peer review process? Could they be objectively interpreted?

**The amount of publications was insufficient. However, a detailed analysis of the top 10% of the papers from subfields (Flagships) is presented under section C.**

**In the CUNI field Pharmacy and Toxicology, all three peer-reviewed papers received a grade of B, which cannot be considered as reliable enough to be used in the evaluation process. The number of reviewed papers was too low to enable drawing reliable conclusions from the peer review process and bibliometric analysis.**

* 1. **Output quality based on the reviews of the selected results.** Is the overall scientific quality of the selected results ranked highly by the reviewers comparable to that of the top publications from the benchmark universities? Is the quantity of the highly ranked outputs adequate and comparable to the quantity of the top ouputs from the benchmark universities?

**Most probably yes. Interestingly, in the field Pharmacy and Pharmacology both D1 papers were ranked lower by the reviewers**

1. **Breadth/completeness of the research in the field/area**

In assessing the breadth of research, the panel decided to focus on the main subfields, also called "flagships." Papers published in each subfield in the Top 10% AIS Journals were considered for further analysis. For multicentric and multinational studies, the contribution of CUNI authors (first author, last author, second and second last author) was taken into account.

**The panel decided to assess the output of the flagship subfield of the 5 medical faculties, as the panel members did not have sufficient expertise to assess all subfields. The outputs were generated from the CUNI subfields publications and focused on the top 10% and, or top 25% of the published papers. Selectively, H-index and citations of the main contributors/authors were obtained from Web of Science (WoS). Two panel members were allocated according to their field of expertise for the majority of flagship subfields. The individual reports follow a structured outline considering the CUNI authors’ (first, second, second last, last and corresponding authors) involvement, particularly in large multicentre and/or international research projects. To compare with benchmark universities the WoS database was applied (Graphs). To switch from CUNI publication data by self assignement to WoS categories is confusing, however the only way to compare with benchmark Universities.**

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| **Cardiology**  As regards cardiology and cardiovascular surgery the evaluation is based on extensive interviews with the leaders of the relevant institutions; calculations of their h-index, assessement of their publication lists and the documents the panel member had at hand, particularly the analysis of scientific publications provided by the institution. Each of the five medical faculties of Charles University are associated with a large hospital, although the faculty and hospitals are legally two different institutions. Thus, a lot of research, is not only done under the umbrella of the medical faculties or the University, respectively, but also at the University hospitals and in some cases also affiliated hospitals, such as the Thomayer Hospital in Prague.  Each of these hospitals has active cardiovascular services, including most diagnostic examinations and interventions of cardiology and cardiovascular surgery, with some differencesdiscussed below.  In addition, there is an important clinical and research institution in Prague, the *Institute for Clinical and Experimental Medicine* (ICEM), which is not associated with Charles University, where cardiology and cardiovascular surgery is also provided at the highest level. This insitution is directly affiliated with the Ministry of Health and is particularly strong in the management of arrhythmias (Prof. Josef Kautzner) and is a national center for cardiac transplantation (together with Brno University).  **PhD Programs:** PhD students are essential for scientific productivity of academic institutions, and Charles University does offer PhD programs.Of note, the Dean of the 3rd Faculty of Medicine, Prof. Petr Widimský is the coordinator of the *Charles University Cardiovascular Research Program* - *Progress Q38* which started in 2016 and is funded through 2021. The *Cardiovascular Re-search Program* is a 4-year program, currently involving 12 PhD students receiving quite a small salary (around 700 Euros). The new cycle starts in 2020 with 16 students. The program is open for PhD students involved in clinical research, epidemiology or basic cardiovascular research. Quite often, these candidates have part-time appointments with hospitals or Charles University to cover their living expenses. An improvement of this situation would be truly desirable.  This program is very promising indeed and appreciated by the reviewers. However, the funding is far from optimal and should be reconsidered and improved in the future. Indeed, a full-time commitment for the PhD program would certainly strengthen the academic productivity of the candidates.  **1st LF – First Medical Faculty (https://lfp.cuni.cz):** Cardiovascular research is rather active in the First Medical Faculty and takes place in the **2nd Department of Internal Medicine/ Cardiology**, led by Prof. Ales Linhart, currently president of the *Czech Society of Cardiology*. The department has approximately 60 physicians and 3 full professors of cardiology, covering different specialties.  The **clinical service** of the department has 2 cardiac catherization laboratories at its disposal and offers all diagnostic and therapeutic interventions for cardiology except cardiac transplantation, which is only performed in the Czech Republic at ICEM in Prague (see above) and the University Hospital in Brno.  Ein Bild, das Screenshot enthält.  Automatisch generierte Beschreibung  **Figure 1**: Bibliometric data of professor Ales Linhart  The clinical focus of this department is acute cardiac care, with particular emphasis on intensive care unite managmenet, the, use of extracorporeal membrane oxygenation (ECMO), and evaluation and treatment of myocardial diseases, specifically cardiomyopathies, myocarditis and Fabry disease. Another focus is peripheral artery disease, including deep vein thrombosis and pulmonary hypertension. For the latter, they provide a unique surgical program: balloon angioplasty of thrombotic pulmonary hypertension.  Ther **academic strength** is Fabry disease, where they regularly investigate a large cohort of 220 patients with this rare cardiac condition. The biblimetric data of the head of the department are depicted in Figure 1. The time course shows a nice growth over the years with the highest citations in 2018 and a slight decline in 2019. 2020 is obviously inclomplete and hence not informative.  **Rating of scientific productivity**: An H-index of 35 can be considered good and reflects the visibility of the research of at this department in the medical literature.  Furthermore, at the First Faculty of Medicine cardiovascular research is also performed in the **Institute of Physiology** (Head: Prof. Ottomar Kittnar). This department performs experimental studies in pigs, with a well-established experimental catheterization laboratory, allowing for the study of cardiogenic shock and the effects of extra corporeal membrane oxygenation (ECMO), resuscitation and arrhythmias. Their bibliometric data are depicted in Figure 2.  Ein Bild, das Screenshot enthält.  Automatisch generierte Beschreibung  **Figure 2**: Bibliometric data of Professor Otto Kittnar  **Rating of Scientific Productivity**: For a professor mainly involved in research, the H-index of 11 is low. Of note, citations have dropped froma peak in 2017.. This is surprising as ECMO is currently a topic of rising interest and importance in cardiogenic shock. Thus, when considering this fact, the productivity is considered suboptimal. Clearly, this group would need a more in depth analysis and mentoring to get on a higher track internationally.  Another focus of the First Facult of Medicine is the study of arterial hypertension. This takes place mainly with the team led by Professor Jiri Widimsky. Their research focuses on secondary forms of hypertension, such as primary aldosteronism among others. The bibliometric data are presented in Figure 3.  **Rating of Scientific Productivity**: With H-index of 26, Professor Jiri Widimsky is below the median in his field. In the past, hypertension was a topic with very high citations, but publications in this area have recently declined due to the lack of major trials and new drugs. Secondary hypertension is clearly no longer center stage and deals with relatively rare diseases which have to be considered when assessing this clinical scientist. For a department chief with his level of experience, the H-index is lower than expected H-index  Ein Bild, das Screenshot enthält.  Automatisch generierte Beschreibung  **Figure 3**: Bibliometric data of Professor Jiri Widimsky.  Finally, cardiovascular prevention and in particular hypertension is also a focus for the Centre of Preventive Cardiology in the **Thomayer Hospital in Prague**, led by Dr. Renata Cifkowa, who is very active in the leadership of the *European Society of Hypertension*.  **Rating of Scientific Productivity**: Renata Cifkowa works in a non-university hospital but is associated with Charles University. Considering her position, her scientific productivity is good (Figure 4). However, as she has been quite active in the *European Society of Hypertension*, some of here citations may come from guideliens and other official documents of the society rather than from own original rsearch. Nevertheless, she is internationally visible in her field. Of concern is a recent decline in citations, reflecting reduced scientific productivity.    **Figure 4**: Bibliometric data of Professor Renata Cifkowa  **Cardiovascular surgery** is led by Prof. Jaroslav Lindner. His research focus is on thromboembolic pulmonary hypertension, aortic root and peripheral artery surgery. His H-index is 12, with a steep increase recently (Figure 5). This H-index is average for a cardiac surgeon.  Ein Bild, das Screenshot enthält.  Automatisch generierte Beschreibung  **Figure 5**: Bibliometric data of Professor Jaroslav Lindner    **Second Faculty of Medicine (**[**https://www.lf2.cuni.cz**](https://www.lf2.cuni.cz)**):** The **Department of Cardiology** is led by Prof. Josef Veselka. This department is unique as thesingle national centre for paediatric cardiology and cardiovascular surgery. Therefore, the institution has a large patient volume and accordingly unique clinical competence in this field in the Czech Republic. The clinical standard is considered excellent also by its colleagues.  **Scientific Productivity**: Among adult cardiology, the academic strength is hypertrophic cardiomyopathy, particularly alcohol septal ablation, where they published quite successfully even in high impact journals such as the *European Heart Journal*. In general, over the last few years they published between 9 and 16 papers per year, 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 of the last years (Figure 6).  Ein Bild, das Screenshot enthält.  Automatisch generierte Beschreibung  **Figure 6**: Bibliometric data of Professor Josef Veselka  Third Faculty of Medicine **(https://www.lf1.cuni.cz):**This is the most prominent and internationally most visible department of cardiology, led by Prof. Petr Widimský. Besides its chairman, the department has four full professors covering different fields of cardiology (Gregor Pavel, Zuzana Motovskà, Rudolf Spacek and Petr Tousek) and 3 associate professsors (Viktor Kocka, Jana Malkova and Pavel Osmancik). Professor Petr Widimský is currently also the dean of this medical faculty.  The **clinical service** covers all of cardiovascular medicine, with a particular strength in the management of acute coronary syndromes and interventional cardiology. Furthermore, they have a unique interdisciplinary interventional team that treatstreating patients with acute stroke and are active in arrhythmia and structural interventions, such as left atrial appendix occlusion, among others.  **Academically**, this centre is extremely productive and the leading centre of the ***Prague Trials****, which have* addressed many important questions in cardiovascular medicine, particularly interventional cardiology in a multi-centre setting involving many cardiac centres in the country. Most of the *Prague Trials* were published in the best journals of cardiovascular medicine with high impact factors.[[1]](#footnote-1) Thus, this cardiology centre is clearly the lighthouse of Charles University in cardiovascular medicine, with visibility in the management of acute myocardial infarction and stroke, atrial fibrillation and His-bundle pacing internationally.  Petr Widimsky is the driving force behind these internationally highly visible and cited ***Prague Trials*** series, publishing over 20 papers in prime journals such as the *European Heart Journal*, the *Journal of the American College of Cardiology*, *Heart Rhythm* among others in and he has also pioneered the interventional treatment of stroke and is now president of the ESC Council for Stroke as a reflection of his contributions in this field as well. With an H-index increasing over the years up to 48 in 2019, his is clearly the leader in cardiovascular medicine in his country (see Figure 7).  Ein Bild, das Screenshot enthält.  Automatisch generierte Beschreibung **Figure 7**: Bibliometric data of Professor Petr Widimsky  **LFPI – Medical Faculty, Pilsen (**[**https://lfp.cuni.cz**](https://lfp.cuni.cz)**):** TheCardiology Centre of this faculty of Charles University is located around 80 km south west of Prague, and led by Prof. Richard Rokyta. The department has 3 associate professors: Ivo Bernat, Milan Hromadka, and Vlastimil Vančura.  **Cardiac surgery**  *General findings*  A total number of 70 publications are categorized as D1 publications. These were distributed between faculties as follows: 1. LF: 30 papers, 2. LF: 11 papers, 3. LF: 17 papers, LFHK: 4 papers, and LFPI 8 papers, respectively.  Most cited and second most cited authors from each faculty were:  1.LF: Ales Linhart (5 authorships), Jan Belohlavek (3 authorships)  2.LF: Josef Veselka (3 authorships), Pavol Tomasov (2 authorships)  3.LF: Petr Widimsky (13 authorships), Petr Tousek (3 authorships)  LFHK: Jaroslav Dusek (2 authorships), all remaining authors (one authorship)  LFPI: Richard Rokyta (4 authorships), Ivo Bernat and Milan Hromadka (3 authorships each)  *“Flagship authors”*  It can be assumed, that Ales Linhart (1.LF), with 329 publications (308 PubMed listed) and 6,927 citations can be termed as one leading researcher. In addition, Petr Widimsky with 431 PubMed listed publications from 3.LF is clearly a leading researcher, identified as a co-author on 13 papers. From LFPI, Richard Rokyta (89 PubMed listed publications) is involved in most of the top ten publications from his center. The Second Faculty of Medicine and LFHK had few publications and no clear leader in research.  *Authorship*  Analysis of publications revealed that 1.LF followed by 3.LF and 2.LF are the leaders in publications in the top 10%. In the majority of cases, the different faculties were involved in international, multicenter studies, with many publications that included authors from different CUNI faculties.. It is also clear that in the majority of publications only one CUNI author is cited, reflecting the international, mulci-center nature of these publications and the fact that these “flagship authors”are working closely with other international institutions, societies or boards (table 1).  The number of publications of primarily institutional research and the number of researchers identified in a specific department is small (Table 2).  *Authorship from each faculty (focus: multicenter publications)*   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | Total number of publications | Multicenter  (n) | Only one author from department  (n/%) | First Author  (n, %) | Senior Author  (n/%) | More than one author from department  (n/%) | | 1.LF | 30 | 26 (86.7%) | 23 (76.7%) | 2  (6.7%) | 2  (6.7%) | 3  (10.0%) | | 2.LF | 11 | 8  (72.7%) | 4  (36.4%) | 3  (27.3%) | - | 4  (36.4%) | | 3.LF | 17 | 17  (100.0%) | 11  (64.7%) | 6  (35.3%) | 5  (29.4%) | 6  (35.3%) | | LFHK | 4 | 4  (100.0%) | 4  (100.0%) | - | - | - | | LFPI | 8 | 8  (100.0%) | 4  (50.0%) | 1  (12.5%) | 1  (12.5%) | 4  (50.0%) |   *Authorship from each faculty (focus: institutional publications)*   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | Total number of publications | Institutional publication  (n) | First Author  (n) | Senior Author  (n) | | 1.LF | 30 | 4  (13.3%) | 3  (10.0%) | 2  (6.7%) | | 2.LF | 11 | 3  (27.35) | 1  (9.1%) | 2  (18.25) | | 3.LF | 17 | - | - | - | | LFHK | 4 | - | - | - | | LFPI | 8 | - | - | - |   *Research focus*  Table 3 depicts the main fields of research from different faculties. Again, in the majority of cases, each faculty is involved in multicenter studies. Some foci are the same, as different faculties had been involved in the same studies. Due to the low number of publications (top ranked publications) analyzed, primary and secondary fields of research may vary from the overall focus of research of each faculty, looking at the overall output.  Furthermore, primary fields of research of one faculty are often also the focus of another faculty. The added value of publications for each faculty with regard to the high ranked publications is limited due to the overlapping of research interests.  *Main fields of research*   |  |  |  | | --- | --- | --- | |  | Primary | Secondary | | 1.LF | - heart failure | - antithrombotic and antiplatelet therapy  - pulmonary hypertension | | 2.LF | - HOCM | - heart failure | | 3.LF | - coronary artery intervention | - antithrombotic and antiplatelet therapy | | LFHK | -antithrombotic and antiplatelet therapy |  | | LFPI | -antithrombotic and antiplatelet therapy |  |   The below figure related to WoS category in order to compare with benchmark Universities. | | | |
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| A: 1st LF (Ales Linhart) and 3rd LF (Petr Wdimsky)  B: 1st LF (3rd Department of IM; Jiri Widimsky), Thomayer Hospital in Prague (Renata Cifkova), 2nd LF CV Surgery (Jaroslav Lindner)  C: Pilsen (Richard Rokyta and Ivo Bernat)  D:, 1st LF, Institute of Physiology, (Otto Kittnar), Biomedical Centre, Pilsen (Milan Stangl), Cardiology Hradek Kralové (Josef Stasek) | | | | | | |  |  |  |  |  |
| **Clinical Neurology**  From an analysis of the top 10% papers in Clinical Neurology, there are in total 96 papers from all medical faculties of CU, 49 from 1.LF, 35 from 2.LF, 7 from 3.LF, 1 from LFHK, 4 from LFPI. One important research direction in Clinical Neurology is multiple sclerosis (25 papers from 1. LF co-authored by Prof. Eva Havrdova, 10 by Dana Horakova). However, only one study published in J Neurol Neurosurg PS (JIF=8.3) has muliple authors from this department, and one publication (Neurology) has Eva Havrodova as first author. Given some influential papers in this field, the Department of Neurology in the 1.LF should be considered as a leading department. However, there was no participation of researchers from 1.LF identified in larger research consortia.  With 6 papers in the field of sleep medicine, Prof. Karel Sonka of the First Faculty of Medicine has published on the highest scientific level (three papers in Lancet Neurology). and can be considered an influential researcher in sleep medicine.  In most publications listed in the top10%, CU researchers are not the coordinating part of the project, reflected in mostly individual co-authorships. A number of papers (8 for 1.LF, 8 for 2. LF, 2 from 3.LF, and 1 from LFPI) with authors from CUNI including MSc students were published at the highest level (Brain, Neurology, Movement Dis), either with first (shared) and/or last (shared last) authors from CUNI. As an example, a publication in Brain 2015: 138:336-355 identifies Helena Hulkova (MSc student) as equally contributing first author. These authors are from the Institute of Inherited Metabolic Disorders, 1.LF. 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 first author from their Institute. Prof. Seeman is a leading researcher in the 2.LF. Interestingly, in the 2.LF, there are two researchers who are part of a larger consortium (e.g. EuroEPINOMICS RES) that resulted in 13 top 10% papers. There is one consortium publication each from 3.LF, LFHK and LFPI.  With 6 papers having either a first and/or last author from CUNI, the 2.LF is the most successful faculty; 3 from 1.LF, 2 from 3.LF, and 1 from LFPI, giving a total of 12 papers with first or last author from CUNI. Moreover, there are 7 additional papers in which CUNI members are shared first or shared last author.  Overall faculties, there is a good coverage of all areas of neurology, including multiple sclerosis, dementia, dystonia, stroke, epilepsy, and encephalopathies including hypersomnia.. Research foci include multiple sclerosis and sleep medicine in 1.LF, encephalopathies and neuropathies in the 2.LF, and stroke in LFPI.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | Clinical Neurology | | Total Number of top 10% Papers | | |  |  |  | 96 | |  |  |  |  |  |  |  | | Papers with ONE author from CUNI | | |  |  |  | 60 | |  |  |  |  |  |  |  | | Papers with MORE THAN ONE author from CUNI | | | |  |  | 36 | |  |  |  |  |  |  |  | | Papers with first and/or last last author from CUNI | | | |  |  | 12 | |  |  |  |  |  |  |  | | Papers with shared first and/or shared last author from CUNI | | | | |  | 7 | | | | |  |
| ENDOCRINOLOGY & METABOLISM  287 (330 - 43 duplicates) scientific peer-reviewed papers formed the basis for this evaluation.  Table 1: Distribution of paper according to journal rank and faculty.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Journal “Rank” | D1 | Q1 | Q2 | Q3 | Q4 | | Total number (#) | **29** | **63** | **100** | **41** | **97** | | # Duplicates | 5 | 0 | 16 | 5 | 17 | | # 1.LF | 12 | 28 | 52 | 15 | 50 | | # 2.LF | 10 | 12 | 15 | 9 | 12 | | # 3.LF | 5 | 19 | 16 | 10 | 17 | | # FaF HK | 0 | 0 | 1 | 0 | 1 | | #LFHK | 1 | 4 | 7 | 4 | 10 | | # LFPI | 1 | 0 | 9 | 3 | 7 | | # Citations \* | 5589 | 1173 | 1327 | 529 | 435 | | # First author CUNI \* | 4 (17%) | 24 (38%) | 44 (52%) | 22 (61%) | 57 (71%) | | # Last authors CUNI \* | 4  (17%) | 22 (35%) | 38 (45%) | 18 (50%) | 51 (64%) |   \* not including duplicates  The fact that there are duplicates only means that the specific paper is reported from different faculties (typically two, but sometime three). This is viewed only as a positive element, because it shows inter-faculty collaboration.  In general, in Endocrinology & Metabolism, there is a quite satisfactory number of first- and last authorships in Q2-Q4. With increasing ranking of journals, this number decreases. In the top journals, it has dropped to 17%. When a manuscript has a CUNI last author, there is reason to believe that the specific study originates from CUNI and therefore represents a “true” CUNI initiative and research idea. For D1 papers there are four last authors papers (two of these with both first and last authorship), which is quite satisfactory. Of these, a last author (Widimsky, Petr) paper (*Reperfusion therapy for ST elevation acute myocardial infarction 2010/2011: current status in 37 ESC.* Eur Heart J) deserves to be mentioned, as it represent an example of a highly international collaborative research endeavour apparently led from CUNI. However, this reviewer is surprised that the paper is found in Endocrinology & Metabolism, where it would have been more appropriate in the Cardiology section. The 29 papers in D1 are a nice mixture of basic, metabolic research and clinical trials/studies, predominantly within diabetes, dyslipidaemia, obesity, thyroid and adrenal diseases.  If a paper has a first and a last author from CUNI, the likelihood that the research is central to the research group is high, and therefore such papers may represent a core research effort by the faculty within this research field:  Fig. 1  The sum is 132, representing 107 papers, i.e. 25 papers are duplicates (reported output from more than one faculty). With these limitations, it seems fair to say that the 1.LF is a CUNI stronghold in Endocrinology & Metabolism, closely followed by 2.LF, 3.LF, and LFHK. In contrast, FaFHK and LFPI are notably weaker. If, however, the five faculties were merged one might hope for a synergistic effect on the research in this field. If this should be successful, it would require not just an organisational merger, but also a physical merger. Another, less attractive, approach could be to merge sub-disciplines in one or two faculties.  Of the 287 unique papers, 39% had neither first nor last CUNI author, 23% had either first or last CUNI author, and 38% has both first and last CUNI author. Seen from the CUNI university perspective, it is encouraging that more than a third of the research output is firmly attached in the university (i.e. both first and last CUNI authorship). On the other hand, it is clear (figure above) that the majority of this research is published in lower ranking journals.  Reducing the dataset to papers with the last author from CUNI provides some information about the productivity per research groups. However, this is somewhat of a superficial approach because last authorships may change within the same research group. Nevertheless, there are 165 papers in this group, of which 32 are duplicates (listed as output from two different faculties), leaving 133 papers to consider in this analysis.  Thirty-nine individuals were last authors on one paper and twelve were last authors on two papers. Of individuals who are last authors on more than 3 papers, the distribution (see Fig. 2) is dominated by one author, Haluzik, M, (1.LF) followed by Sobotka, L. (LFHK). Their research areass are in particular inflammation, dyslipidaemia, obesity, nutrition, diabetes, and adipose tissue biology.  Fig.2  For last authors reporting less than three papers, the majority are published in Q4 (50%), Q3 (14%), Q2 (18%), but notably also Q1 (15%) and D1 (3%) are well represented. Stratification of the entire pool of 133 last authorships on “ranking” of journals is shown in Fig. 3.  Fig. 3    Thus, it is not evident that authors reporting less than three papers are publishing particularly in lower ranking journals. However, there a tendency to more papers in Q4, and a little less in the medium Q2, among last authors reporting less than three papers. This may have explanations, for example that these authors are early career researchers, but information about this was not provided to the present reviewer.  The data also demonstrate that there is substantial collaborative research with other national and international (the data does not allow for a distinction between the two) research institutions. Thus, out of the total number of reported papers (n=287), 111 (39%) have CUNI co-authors who are neither first nor last author. By inspecting of the distribution according to journal ranking (i.e. comparing Fig. 1, 3 and 4), it is seen that high impact journals (D1 and Q1) are more prevalent, at the expense of lower ranking (Q3 and Q4) journals.  Fig. 4  Thus, one may conclude that CUNI researchers largely benefit from their collaboration with other research institutions, and that research originating from CUNI (Fig. 1 and 3) does not quite match the level (if journal ranking can be taken as an indicator for that) that is achieved in non-CUNI research collaborations.  Overall assessment.  Based upon the material provided, my impression is that a few very productive groups dominate CUNI research in the field of Endocrinology & Metabolism. There appears to be high quality research coming from selected areas and groups, but there is also high quality research that has been produced by other faculties. It is clear that high quality research is accomplished, not the least due to collaborative efforts with other institutions.  If the Endocrinology & Metabolism field at CUNI, irrespective of the five faculties individual contributions, should reach higher impact, a re-structure and perhaps merging of faculties (or research groups) would be necessary.  The figure below shows the number of paper per author for the observation period (2014-2018) based upon Web of Science data extraction in comparison withg benchmark universities. It’s clear that CUNI is in the lower end. In comparison with the FORD: Medical and Health sciences paper per author graph (page 4), the production in Endocrinology & Metabolism is close to the overall average for the entire CUNI university. Disregarding the journal ranking provides a smimilar picture of papers per author: Vienna (4.5) > Milan (4.0) > Heidelberg (3.8) > Copenhagen (3.6) = Leuven (3.6) > CUNI (2.8) > Warsaw (1.5). Thus, based upon these data, there is room for improvement in the research output in Endocrinology & Metabolism at CUNI | | | | | | | |  |  |  |  |
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| **NEPHROLOGY**  Nephrology at the Charles University concentrates on highly relevant, clinical research, with limited basic science research. All areas of nephrology are well covered, with different investigators specializing in research in pediatric nephrology, glomerular disease, hemodialysis, transplantation, and acute kidney injury. By inspecting the top 10% of papers in nephrology, there are a total of 18 papers, with 14 from 1.LF, 1 from 2.LF, 2 from 3.LF, and 2 from LFPI. Dr. Vladimir Tesar is a key faculty contributor from 1.LF, and he contributes 13 of the 18 papers. He is an accomplished clinical trialist in nephrology with over 400 publications, many in high quality journals. Dr. Ivan Rychlik at 3.lf is also a consistent contributor, with 328 papers. He has also participated in numerous clinical trials, often with Dr. Tesar. Dr. Tomas Seeman from 2.lf has a number of publications in pediatric nephrology, including on hypertension in childhood and on pediatric disorders. There is limited basic science research. Maintaining basic science research is often at the expense of clinical research. In terms of publications, the Charles University is highly competitive internationally, with 118 top-tier manuscripts vs. 185 in Heidelberg, 139 in Milan, and 104 in Copenhagen, 93 Leuven, and 11 in Vienna.  Critique: Nephrology at the Charles University is well-represented in clinical nephrology. Further development of junior faculty should be an important goal. Urology has not been assessed as separately categorised by CUNI and WoS. The graph below include therefore Urology. | | | | | | | |  |  |  |  |
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| **Obstetrics & Gynecology**  The Department of Obstetrics/Gynecology is highly focused on providing excellent clinical care, with over 5,000 gynecologic operations performed last year. Their website (<https://gynpo.lf1.cuni.cz/en/profile-of-the-clinic-8208>) even acknowledges the difficulties of performing research: „One of the main components of work at this department is scientific research although at an institution with surgical orientation and many other obligations, this can be difficult.“ The primary area of research interest of the First Faculty of Medicine is in gynecologic ultrasound, which is led by Dr. Daniela Fischerova, with an H index of 23 and 132 publications.  Dr. Michal Zikan publishes in different areas, including ultrasound and gynecolog oncology and genetics and has 131 publications with an H index of 27. For the First Faculty of Medicine, Dr. Ursula Guillen (H index 8) has published on prematurity, and Dr. Magali Verheecke (H index 9) has published on gynecologic oncology. In the Third Faculty of Medicine, publications are limited. LFHK is led in publications by Dr. Marian Kacerovsky with 173 publications and an H index of 26. Her research is focused on the placenta and amniotic fluid. The university has a very similar number of publications per author and high quality papers per author asa the leading universities in Europe. Publications by significantly more authors results in significantly more publications in Copenhagen, Milan, and Leuven, with less publications in Heidelberg and Vienna. Research does not appear to have a primary emphasis in the Department of Obstetrics and Gynecology. Research in gynecologic ultrasound does appear to be improving, and there are significant opportunities of collaboration between the strong genetics research at Charles University and obstetrics/gynecology, with evidence of some publications this area.    **Oncology and Haematology**  Across all 5 medical faculties in CUNI, a total of 949 papers with an AIS were produced within the oncology and haematology subfields, representing 1.4 outputs per member of staff. Among the 949 outputs 215 (23%) ranked in the top 10% (D1) with 14%, 19%, 20% and 28% in Q1-4 respectively. Focusing exclusively on the D1 papers, we found that 27 outputs were produced by >1 faculty and hence the number of unique publications was 188 papers. Examining the spectrum of cancer investigated in these 188 D1 papers, we found that more than half (100/188, 53%) were on haematological malignancies (leukaemia, lymphoma, myeloma) whereas only 11% (21/188) focussed on the major five cancer types (breast, lung, bowel, skin and prostate). Among the remaining 67 publications, 14 were pan-cancer studies. An examination of the broad type of study revealed that 38% were clinical trials or studies, 26% were basic science, 23% were translational and 12% were guidelines, reviews and meta-analysis. The distribution of D1 papers across the faculties was broadly similarly (0.3-0.4 D1 paper per member of staff) with the exception of the Second Medical Faculty which had a ratio of 0.76 D1 paper member of staff. This difference was largely driven by a high number of leukaemia papers produced by this faculty – 44 DI papers from a total 22 members of staff classified in the haematology sub-field for this faculty.  Among the 188 D1 papers, 63 (34%) were in high impact journals (Lancet Oncology (n=24), Journal of Clinical Oncology (n=15), The Lancet (n=5), The New England Journal of Medicine (n=5) etc). Collectively these studies had an H-index of 63, an average citation rate of 86 with 38 papers being cited >100 times. However, among these highly cited papers only 3 had CUNI senior authorship (first or last): (a) two European Urology papers from Professor Marko (Marek) Babjuk from 2.LF with 855 citations and (b) a Journal of Clinical Oncology paper from Professor Jan Stary, also from 2.LF. This theme of a paucity of CUNI authors in senior authorship position is reflected across all 188 publications with only 26 (14%) having a CUNI senior author (first, last or joint first).  Focussing on these 26 CUNI driven D1 papers, 12 were authored by 2.LF staff only, 6 by 1.LF and 2.LF staff, with the remaining 8 authored by other combinations. In terms of speciality 14/26 (54%) were leukaemia papers, 4 pan-cancer papers, with each other cancer type having 1 or 2 studies. The type of research covered by these papers was basic science (n=9), translational (n=9), clinical trial/study (n=5), Guidelines/Reviews/Meta-analysis (n=3). All 26 papers were individually reviewed by two external reviewers . The quality of these papers was excellent: 21 scored A, 4 scored B and one C. Five authors appeared on 5 or more of these 26 CUNI driven D1 papers: Hrusak, Ondrej (n=7); Mejstrikova, Ester (n=5); Stary, Jan (n=6); Trka, Jan (n=10); Zaliova, Marketa (n=7) all of whom are part of the same research group.  During this evaluation, period over 900 outputs were produced in the sub-fields of oncology and haematology but only one quarter were ranked in the top 10% journals. Furthermore, the research focus of the D1 papers was highly skewed towards haematological cancer, with top class research into the five major cancer types being poor. CUNI researchers have contributed towards many excellent papers, including 63 papers in the very best journals. However, for the bulk of the papers CUNI researchers contributed (86%) rather than led (14%) the research. The research that was led by CUNI researchers was, however, excellent, and 66% papers scored a grade A in external review. This analysis only revealed one group that was consistently leading and publishing in D1 papers, which was the Childhood Leukaemia in Prague (CLIP) headed by Professors Jan Trka and Jan Stary and based in the Second Medical Faculty.  With respect to international benchmarks, the field of hematology and oncology differ considerably with respect to the number of AIS publication per member of staff For the top 50% outputs, CUNI ranks 2nd out of 7 universities in hematology,, while it is last in oncology. Hematology (especially in 2.LF) can be considered a flagship centre of expertise. (source WoS bibliometric data)  Between 2014 and 2018 a total of 90 external grants were active in the fields of oncology and hematology, with total funding of 14.3 million euro. This is not a large amount of income spread across the academic and research staff population which included 112 core staff (>50% invovlement rate) and 210 non-core staff (<50% invovlement rate). Furthermore, 28 (31%) of the grants and 5.4 million euro (38%) of the funding came from a single –area: the Department of Paediatric Haematology and Oncology in the 2nd Faculty. Therefore, the external grant income of the remaining CUNI oncology and hematology researcher is not good. Equally concerning is the decline in external grants awarded in the past three years: 14 in 2016, 10 in 2017 and 5 in 2018. On the plus side, we note that CUNI researchers are involved in several EU funded grants including (1) Childhood Leukemia: Overcoming distance between South America and Europe Regions; (2) Translational studies of HEAD and neck cancer in South America and Europe; (3) Female cancer prediction using cervical omics to individualise screening and prevention. However none of these projects are being led by CUNI researchers.  SUMMARY: 188 D1 papers out of total of 949  A screenshot of a cell phone  Description automatically generated | | | | | | |  |  |  |  |  |
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| **Pharmacy, Pharmacology and Toxicology**  In the subfields Pharmacy & Pharmacology and Toxicology among 569 papers published by CUNI authors in the period 2014-2018 , 531 papers (12 D1, 73 Q1, 178 Q2, 146 Q3 and 122 Q4) were assigned to the subfield Pharmacy & Pharmacology and 38 papers (2 D1, 6 Q1, 17 Q2, 5 Q3 and 8 Q4) were assigned to the subfield Toxicology, demonstrating that at CUNI the subfield Pharmacy and Pharmacology is much more stronlyg represented than the subfield Toxicology. The total number of D1, Q1, Q2, Q3 and Q4 publications per faculty can be seen in the table   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  | 1.LF | 2.LF | 3.LF | LFPI | LFHK | FaF | Sum | | D1 | 1 (1.1 % | 0 (0.0 %) | 0 (0.0 %) | 1 (6.7 %) | 1 (1.6 %) | 12 (3.2 %) | 15 | | Q1 | 13 (14.8 %) | 0 (0.0 %) | 3 (16.7 %) | 0 (0.0 %) | 12 (19.3 %) | 50 (13.2 %) | 78 | | Q2 | 26 (29.5 %) | 5 (62.5 %) | 9 (50.0 %) | 3 (20.0 %) | 22 (35.4 %) | 130 (34.4 %) | 195 | | Q3 | 25 (28.4 %) | 2 (25.0 %) | 2 (11.1 %) | 7 (46.7 %) | 11 (17.7 %) | 104 (27.5 %) | 151 | | Q4 | 23 (26.1 %) | 1 (12.5 %) | 4 (22.2 %) | 4 (26.7 %) | 16 (25.8 %) | 82 (21.7 %) | 130 | | Sum | 88 (100 %) | 8 (100 %) | 18 (100 %) | 15 (100 %) | 62 (100 % | 378 (100 %) | 569 |   Among CUNI faculties, thehighest number of top half publications in Pharmacy, Pharmacology and Toxicology in the period 2014-2018 were produced by FaF (12 D1 papers, 3.2% of total FaF publications; 50 Q1 papers, 13.2% of total FaF publications; 130 Q2 papers, 34.4% of total FaF publications). LFHK was second in productivity in high ranking journals over the last four years(1 D1 paper, 12 Q1 papers, 22 Q2 papers). Clearly, FaF is a flagship institution at CUNI for Pharmacy, Pharmacology and Toxicology, followed at a distance by LFHK. 1.LF is a flagship institution at CUNI in Pharmacy and Pharmacology. However, in Toxicology alone the 1.LF is a flagship faculty with 1 D1 paper, 5 Q1 papers, 8 Q2 papers, 5 Q3 papers and 4 Q4 papers published in the 2014-2018 period. TheDepartment of Microbiology and Biomedical Centre at the Faculty of Medicine in Plzen (LFPI) is a leader in the pharmacology of antimicrobial drugs.  According to number of D1 papers in 4 years period Constantinos Papagiannitsis(H-index 18, 12 papers in D1 journals between 2014 and 2018) and Jaroslav Hrabak (H-index 17, 11 papers in D1 journals between 2014 and 2018) from Department of Microbiology, Faculty of Medicine and University Hospital in Plzen, Charles University, Plzen can be considered as leading authors and LFPI as a flagship faculty. Papagiannitsis C is also an Assistant Professor, Department of Microbiology, Faculty of Medicine, University of Thessaly, Larissa, Greece, and his most cited papers were published in *J Antimicrobial Chemotrepary* and *Clinical Microbiology and Infestions* etc. Dominant topics are antimicrobial susceptibility and antibiotic resistance. Jaroslav Hrabak’s most cited papers were published in *Lancet Infectious Disease* and *Journal of Clinical Microbiology*. Important topic is genetics of antibiotic resistance.  Although the research of both authors could be classified as pharmacology (WoS classification) as well as to experimental biology (self assignment), it is clear that at CUNI top pharmacology research is not limited only to formal units of Pharmacy and Pharmacology. Constantinos Papagiannitsis and Jaroslav Hrabak are not included in the CUNI subfield Pharmacy, Pharmacology and Toxicology. This observed discrepancy is demonstrating a weakness of the current classification for the evaluation purpose.  According to the analysis of D1 and Q1 papers, Petr Pavek from Department of Pharmacology and Toxicology, Faculty of Pharmacy in Hradec Kralove (FaF) (H-index 32, 2488 pure citations, 21.21 citations per item) can be considered as a flagship author and FaF as a flagship faculty. In the period 2014-2018 he has published 52 papers (2 times D1 last author, 4 times Q1 last author, 5 times Q2 last author, 1 time Q3 last author, 2 times Q4 last author) which altogether have 459 citations (415 pure citations) and an H index of 12, 8.83 citations per item. The most cited work from this period (published 2016) is a research paper having 40 citations.Frantisek Staud from the same Department (H-index 27, 1654 pure citations, 19,23 citations per item) can be considered as a follower. In the period 2014-2018 he has published 28 papers (0 times D1 last author, 5 times Q1 last author, 7 times Q2 last author, 2 times Q3 last author, 2 times Q4 last author) which altogether have 261 citations (219 pure citations) and an H index of 11, 9 citations per item. The most cited work (published 2014) is a research paper having 41 citations. In total he has 4 papers with over 100 citations.  The subfield Pharmacy & Pharmacology is strongly presented also at the Department of Pharmacology at LFHK (Sterba Martin, H index 19, 1313 citations, 22.86 citations per item, 21 papers published in the 2014-2018 period, H-index 7 and Micuda Stanislav, H-index 18, 815 pure citations, 8.98 citations per item, 21 papers published in the 2014-2018 period, H-index 9).  The subfield Toxicology is strongly presented at the Department of Occupational Medicine, Toxicology Informational Centrum of 1.LF (Pelclova Daniela, H index 25, 1297 pure citations, 10.07 citations per item, 88 papers published in the 2014-2018 period, H-index 19 and Sergey Zakharov, H index 14, 261 pure citations, 6.61 citations per item, 54 papers published in the 2014-2018 period, H-index 14).  The analysis demonstrates that very often the research is performed primarily within one Faculty or within CUNI collaboration only. Five out of 12 D1 papers from FaF were produced only by FaF authors. These works (908, 909, 910, 912, 913) are mentioned explicitly, as these publications are truly a product of the CU - FaF and often reflect successful PhD training and funding acquisition. In 4 further D1 papers done under limited national or international collaboration (905, 907, 911, 6886) the first or last author are also coming from FaF, indicating FaF as a flagship institution. The top papers from other institutions were generally produced in broad national or international collaboration. In most D1 publications (12/14) the first authors are from CUNI and most senior authors (10/14) are also form CUNI. Interestingly, all D1 papers of Petr Pavek were centered at FaF and had a limited national or international collaboration, wheres his Q1 papers were produced within CUNI (no international) collaboration. The same is true for F. Staud (one exception, UniErlangen, Uni Manchester) and V. Wsol (only FaF colaboration). The leading faculties and Departments are strongly recommended to analyze how fostering international collaboration could provide added value to exiting prevailing inter-CUNI or national collaboration in the subfields Pharmacy & Pharmacology and Toxicology.  When realized, the collaboration within CUNI brings added value. Commendably, the research leader at FaF, Petr Pavek, collaborates with the research leader Stanislav Micuda at LFHK.  The proportion of reviews amog the top D1 papers is 28% (4/14) indicating a very solid research activity in Pharmacy, Pharmacology and Toxicology at CUNI.  At the flagship institution FaF HK, the coverage of research fields is relatively broad, with pregnane X receptor and other nuclear receptor-mediated regulation of enzymes and transporters (P. Pavek), drug efflux transporters and fetal pharmacology (F. Staud) and reductases (V. Wsol) be identified as leading research fields. Liver pharmacology (Micuda Stanislav) and cardiac pharmacology (Sterba Martin) are the main research field at LFHK and methanol poisoning (Zakharov Sergiy, Pelclova Daniela) at 1.LF.  Notwithstanding with the flagships identified according to the applied evaluation methodology and presented above, the classical pharmaceutical research areas such as medicinal chemistry [antituberculotic agents, multitarget and hybrid compounds (Jarmila Vinsova, Martin Dolezal, Jan Zitko), iron chelators (Tomas Šimunek)], analysis [chromatography (Frantisek Švec, Petr Solich)] pharmaceutical technology and biopharmacy [topical drug delivery (Katerina Vavrova)], pharmaceutical botany (Lucie Cahlikova) and biochemistry (Lenka Skalova) are also strongly presented at FaF HK. With some exceptions these works have mostly not been published in highest ranking journals but importantly contribute to the coherence of pharmaceutical research at CUNI. The researchers in the cited areas are strongly recommended to increase the visibility of their research by targeting higher ranking journals.  Comendably, FaF HK owns several patents protecting various structural types of antimicrobial compounds, instruments and methods. A patent application on new antituberculotic agents was licenced to a pharmaceutical company.  Data from the table and the graph comparing the research output at CUNI and the six benchmark univerisities in the period 2014-2018 shows that by papers in highest IF journal (>10%, D1) per author the ranking order is as follows: Leuven, Heidelberg, Copenhagen and Milan, Vienna, CUNI and Warsaw. Quantitatively in D1 papers category CUNI is 3-4 times below the European leading benchmark universities (Leuven, Heidelberg, Copenhagen) but close to Vienna and above Warsaw). Ranking based on top half journals is similar (Leuven, Milan, Copenhagen, Heidelberg, Vienna, CUNI, Warsaw. However, the difference between CUNI and top universities is two-fold (Leuven / CUNI =1.96 vs. 0.92). Comparing the number of publications per author in the bottom half journals shows a tendency of “reverse ranking” with much smaller differences. As a recommendation based on comparing ranking in top 10% and top half journals, CUNI needs more publication in top 10% and also in top half journals.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | WoS Category: PHARMACOLOGY & PHARMACY and TOXICOLOGY | | | | |  |  |  |  |  | | University | HC | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A | | CUNI | 436 | 400 | 0,9 | 235 | 0,5 | 57 | 0,13 | 635 | 1,46 | | Heidelberg | 364 | 493 | 1,4 | 149 | 0,4 | 155 | 0,43 | 642 | 1,76 | | Warsaw | 109 | 69 | 0,6 | 33 | 0,3 | 12 | 0,11 | 102 | 0,94 | | Copenhagen | 755 | 1.221 | 1,6 | 245 | 0,3 | 273 | 0,36 | 1.466 | 1,94 | | Milan | 482 | 765 | 1,6 | 276 | 0,6 | 169 | 0,35 | 1.041 | 2,16 | | Vienna | 195 | 226 | 1,2 | 73 | 0,4 | 46 | 0,24 | 299 | 1,53 | | Leuven | 392 | 766 | 2,0 | 196 | 0,5 | 203 | 0,52 | 962 | 2,45 | | | | | | | | |  |  |  |  |
| SUMMARY  Although the subfields of Pharmacy and Pharmacology and Toxicology at the Charles university have a strong international context, the subfield Pharmacy and Pharmacology is much more stronly  represented than the subfield Toxicology. Whereas in Pharmacy and Pharmacology FaF HK is the flagship faculty in the period 2014-2018, the flagship institution in Toxicology in the same period is 1.LF.  In the top 10%  and top half category papers the scientific subfields Pharmacy and Pharmacology and Toxicology at CUNI are clearly below the European leading benchmark universities. An important conclusion from this analysis is that CUNI authors in order to improve their visibility in the subfields Pharmacy and Pharmacology and Toxicology should increase publishing  in top 10% and top half journals.  In the subfields Pharmacy and Pharmacology and Toxicology very often the research is carried out within one Faculty or within CUNI collaboration only, therefore the leading faculties  and Departments are strongly encouraged to analyze how fostering international collaboration could provide added value to exiting prevailing inter-CUNI or national collaboration in the subfields Pharmacy & Pharmacology and Toxicology.  In the evaluation of subfields Pharmacy and Pharmacology and Toxicology a discrepancy was observed between the existing CUNI classification and WoS classification which was responsible for losing several top papers that were internally assigned to a subfields outside Pharmacy and Pharmacology and Toxicology (in WoS classification there were 56 D1 papers compared to only 14 D1 papers in CUNI Subfield classification). This should be considered with future evaluations. | | | |  |
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| **Psychiatry and Sexuology**  There are three articles with Papezova from 1. LF, Department of Psychiatry (1. Faculty of Medicine) as a co-author. The author is known for long term involvement in clinics and publications on eating disorders. These are the results of an international project of a genetic study of mental anorexia. She is not listed among authors in the second article; her name is in the acknowledgement of involved researchers. She is a co-author listed among hundreds of co-author in the third article published in Science journal as is quite typical for international genetic studies. Immediate clinical impact of this article is low. As the impact factors of these journals are high, the involvement of the author/department in this study confirms the recognition of the author and the institution by the international research community. The article in Science can be considered as very important in an effort to find a genetic base for major psychiatric diseases.  The article with P. Sos (3. LF) as a co-author was published in the American Journal of Psychiatry. It is a meta-analysis, and the original publication of P. Sos et al. was included in this meta-analysis, so it is supposed that this was the main reason for co-authoring. The topic is of emerging interest with high clinical impact, and the article already has 171 citations. The co-authoring in this meta-analysis can be an important sign of recognition of the department at an international level.  The article of Winkler et al. was published in Lancet. It was assigned to the 1. LF in the bibliographic .xls file, but according the first author should be assigned to the 3. LF. There are co-authors from 1. LF and the study was done in cooperation with the King's College and Palacky University. Publication in Lancet is a mark of importance, but the topic is more social medicine or social psychiatry, not core clinical medicine. The reform of psychiatry in post-socialist countries is an attractive topic.  There are three articles listed in D1 from a group of authors Martin Alda and Tomas Hajek assigned to the 3. LF. Al three articles are on aspects of bipolar disorder with clinical impact. One of them is a review of lithium (Alda as the single author). Both authors are highly internationally recognized in the study of bipolar disorder; both are members of Department of Psychiatry, Dalhousie University, Halifax, NS, Canada with affiliation in 3. LF, but primary at National Institute of Mental Health in Klecany, The Czech Republic.  An article by Spaniel and co-authors mostly from the 3. LF published in Schizophrenia Research is more from the neuroscience group than clinical psychiatry. It is a highly interesting topic about the fundamental questions about schizophrenia but has only 15 citations according to Google Scholar.  An article with co-authors from 3. LF is the result of significant international cooperation focused on white matter changes in schizophrenia.This article also is more neuroscience research and not a core clinical study with immediate impact.  An article in JAMA about the genetics of schizophrenia and should probably be deleted,as members of the 2. LF are only listed in consortium and are not among authors of the article.  **Conclusions**:  In the group D1 of Psychiatry and Sexology, there are 10 articles suitable for evaluation. Three of them are from 1. LF and are from the Department of Eating Disorders under the lead author of Dr. Papezova. The main addition to the published studies is providing the genetic material of properly diagnosed patients. The significance of this article for CUNI is the recognition of this department as a reliable partner for international cooperation and co-authoring in highly recognized journals.  All other articles are from 3. LF. There is a problem of assignment of these critical works (or publications) to the profile of CUNI. All authors are primary affiliated to the National Institute of Mental Health, Czech Republic (do not be confused by the same name of the institution to the USA NIMH) and have affiliation to the 3. LF as a secondary affiliation. This problem should be take into account in the CUNI evaluation process. There are also authors who are fully employed by theCzech NIMH (Horacek, Filip, Winkler). In addition, other authors (Alda, Hajek) who are internationally recognized are employed at the Department of Psychiatry, Dalhousie University, Halifax, although they started their careers at NIMH.  It is clear that Czech NIMH affiliated with 3. LF is a leading centre for research in psychiatry in the Czech Republic. This institution cooperates with other Faculties of Medicine of CUNI but also with other institutions in the Czech Republic and abroad.  It is possible to identify some flagships in psychiatry at CUNI. At the 3rd Faculty of Medicine. Prof. Hoschl is a departmental and international leader. There are several research fields with both high attractivity and level of scientific work (e.g. MRI in psychiatry, psychotropic substances for treatment of mental disorders). The authors from 1st Faculty have the largest number of publications in general. They cover a broad spectrum of subfields in psychiatry including sexology, without a clear leading research topic. Psychiatry at the 2nd Faculty of Medicine is oriented to child psychiatry, and child autism is recently extremely important field of interest. L. Hosak from the Faculty of Medicine Hradec Kralove collaborates internationally on publications on genetics and epigenetics in psychiatry. The Faculty of Medicine in Pilsen has less research and publication activity. However, Dr. Jan Vevera has published a number of articles on the underlying genetic and psychiatric basis of violence and impulsive violence. His H-index is 11 and his research has been cited 413 times. However, this is an area of increasing importance. Such investigators are likely to be under the radar in this evaluation and methods to include them would be helpful in future reviews of the faculty.  According the chart below from WoS, CUNI is comparable to the Universities of Heidelberg, Copenhagen, Milan and Vienna, is better than University of Warsaw. University of Leuven is much better in quantity of articles per author. | | | | | | |  |  |  |  |  |

**Surgery**

*General*

Across all 5 medical faculties, a total of 186 outputs were produced within the Surgery subfield, which represents 1.1 outputs per member of staff. A total number of only 4 publications fall into the D1 category, and another 18 in the Q1 category. This adds to 22 papers, which were analysed for the purpose of this review. Distribution between faculties is as follows: 1. LF: 12 papers (1 D1), 2. LF: 7 papers (2 D1), 3. LF: none, LFHK: 1 paper (D1), and LFP 2 papers (no D1).

*Authorship*

Senior authorship (1st and/or last author) was found to occur as follows in the respective faculties: 1.LF (12 papers), 2.LF (4), 3.LF (nil), LFPl (2) and LFHK (1). With respect to sub-specialties within surgery, the most productive unit was General Surgery (GI), with an output of 8 out of 22. The rest were spread amongst 6 others (bariatric, breast, thoracic, vascular, urogenital and head and neck surgery), each with 1-2 papers. All of the preceding were clinical studies, except for 4, that were either consensus statements, guidelines or congress proceedings. There was only one randomized controlled trial (RTC) overall. Unfortunately, none of the publications were in the external peer-reviewed group database, provided by CUNI.

*Flagship authors*

Even though the D1 papers were few (4), they were published in high-impact class journals: Annals of Surgery (IF 9.476), British Journal of Surgery (IF 5.572) and Surgery (IF 3.476). With such few top-level publications, it is difficult to determine true ‘flagship authors’, but these three stand out. 2 D1-1st authors: **Tomas Harustiak** (1.LF; publ. 23, citations 165, H-index 8) and **Filip Cecka** (LFHK; publ. 19, citations 101, H-index 7). There was one last author in D1, **Alan Stolz** (1.LF). 2 of the 4 D1 outputs were either a consensus statement (30+ co-authors listed) and a symposium proceedings (20+ co-authors), with one CUNI staff in each, and in the middle of author list.

Otherwise in Q1, there were 10 and 8, first and last authors respectively. Overall, CUNI had 12 (out of 22) first authors, 5 second and 9 last (D1 and Q1 combined). The most productive faculty was 1.LF.

*Research Grants*

With respect to grant funding, the field of Sugery received 10 national grants for the years 2014-2018, but no interntional funding (source: provided CUNI spreadsheet). The funding source was Czech Science Foundation for one and Ministry of Health for the other nine. The 1.LF had 3 grants, totatalling 195 thousand EUR paid during 2014-2018, 3.LF had 5 grants, with a total of 162 thousand EUR, and LFP 2 grants, totalling 97 thousand EUR. Overall, I think this would be considered a rather moderate amount of grant money. There was no data listed for the 2.LF and LFHK in Surgery.

*International Ranking*

With respect to international benchmarks, the field of surgery is unfortunately near the bottom. Overall for total outputs, at 1.1 paper per author, CUNI ranks 6th out of 7 benchmark universities in Europe. For the top 50% output, CUNI is tied with Warsaw in the last place. (source WoS bibliometric data).

*Summary*

In summary, the outputs in the sub-field of Surgery are on the low side, which creates an inherent inability to evaluate this area in depth. However, some broad trends and conclusions may be drawn. The 1.LF appears to be most productive faculty and the sub-specialty of General Surgery is the most actively published area. The very low level of D1 publications with respect to the other fields in medicine, may be due to insufficient staff that is too busy with clinical activities to pursue publications and/or there may not be defined research associates with protected research time. From my Canadian experience, this is usually due to the burden of having to earn a clinical income from seeing patients and carrying out surgeries, which leaves little time for research. Sufficient “protected” research time is key in producing quality research and mandatory for lab bench science (at least 50-70% protected time is recommended for designated personnel to yield significant outputs). This of course means that the funding formula of clinician-researches has to be reviewed and a new model needs to include “hard” money for the research activities. Given these findings, evaluation of this particular field would benefit with on-site visits and discussions with the deans.

TABLE SUMMARY: 22 D1+Q1 papers out of total of 186

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beiliegend die unterschriebene:Dokumente:2020 Charles University:Statistics:Documents to work with:List with CZ Authors:wos_surgery.pdf

1. **Contribution of individual CU units to the field/area development**

**To analyse the output of te 4 main fields, from the 5 medical faculties and a faculty of pharmacy as defined by CUNI the panel used the same Quantity/Quality index – papers / author / above 50% AIS vs papers / Author / below 50% AIS. The data have been extrapolated from FORD and CUNI Bibliometric support according the assignement to the field or area by the authors. As Pharmacy and Toxicology (P&T) is defined only by CUNI, while FORD include P&T within the 4 main fields, it was decided to present both FORD and CUNI.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Basic medicine FORD** | |  |  |  |  |  |  |  |  |  |
| Unit | HC | Share Major | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A |
| 1. LF | 543 | 54.1% | 395 | 0.73 | 522 | 0.96 | 47 | 0.09 | 917 | 1.69 |
| 2. LF | 259 | 57.4% | 221 | 0.85 | 266 | 1.03 | 31 | 0.12 | 487 | 1.88 |
| 3. LF | 211 | 57.8% | 117 | 0.55 | 240 | 1.14 | 14 | 0.07 | 357 | 1.69 |
| FaF HK | 265 | 74.6% | 181 | 0.68 | 157 | 0.59 | 14 | 0.05 | 338 | 1.28 |
| LFHK | 224 | 62.2% | 112 | 0.50 | 220 | 0.98 | 10 | 0.04 | 332 | 1.48 |
| LFPl | 185 | 60.5% | 169 | 0.91 | 197 | 1.06 | 48 | 0.26 | 366 | 1.98 |

**beiliegend die unterschriebene:Dokumente:2020 Charles University:Statistics:Documents to work with:Individual reports:FORD comparson:ford_basic_medicine.pdf**

**Taking into account the headcount of authors/researchers, the output on average is more or less equaly distributed with slightly higher output from 2.LF and LFPl and slightly lower from FaF HK, howeder the later with better proportion of higher quality papers.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CUNI Field: Basic Medicine** | | |  |  |  |  |  |  |  |
| Unit | HC | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A |
| 1.LF | 199 | 388 | 1.95 | 386 | 1.94 | 69 | 0.35 | 774 | 3.90 |
| 2.LF | 176 | 246 | 1.40 | 234 | 1.33 | 62 | 0.35 | 480 | 2.73 |
| 3.LF | 97 | 93 | 0.96 | 182 | 1.88 | 11 | 0.11 | 275 | 2.84 |
| FaF HK | 1 | 6 |  | 4 |  | 1 |  | 10 |  |
| LFHK | 60 | 84 | 1.41 | 122 | 2.05 | 8 | 0.13 | 206 | 3.46 |
| LFPl | 99 | 168 | 1.70 | 191 | 1.93 | 49 | 0.49 | 359 | 3.63 |



|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clinical medicine FORD** | |  |  |  |  |  |  |  |  |  |
| Unit | HC | Share Major | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A |
| 1. LF | 933 | 74.0% | 993 | 1.06 | 758 | 0.81 | 324 | 0.35 | 1,751 | 1.88 |
| 2. LF | 502 | 78.8% | 595 | 1.19 | 401 | 0.80 | 188 | 0.37 | 996 | 1.98 |
| 3. LF | 376 | 79.3% | 309 | 0.82 | 315 | 0.84 | 72 | 0.19 | 624 | 1.66 |
| FaF HK | 30 | 25.4% | 42 | 1.40 | 30 | 1.00 | 2 | 0.07 | 72 | 2.40 |
| LFHK | 351 | 78.7% | 194 | 0.55 | 310 | 0.88 | 50 | 0.14 | 504 | 1.44 |
| LFPl | 298 | 82.8% | 211 | 0.71 | 323 | 1.08 | 80 | 0.27 | 534 | 1.79 |

**beiliegend die unterschriebene:Dokumente:2020 Charles University:Statistics:Documents to work with:Individual reports:FORD comparson:ford_clinical_medicine.pdf**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CUNI Field: Clinical Medicine** | | |  |  |  |  |  |  |  |
| Unit | HC | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A |
| 1.LF | 1,005 | 1,072 | 1.07 | 698 | 0.69 | 330 | 0.33 | 1,770 | 1.76 |
| 2.LF | 523 | 626 | 1.20 | 373 | 0.71 | 203 | 0.39 | 999 | 1.91 |
| 3.LF | 438 | 386 | 0.88 | 324 | 0.74 | 102 | 0.23 | 710 | 1.62 |
| FHS | 24 | 16 | 0.67 | 8 | 0.34 | 0 | 0.00 | 24 | 1.01 |
| LFHK | 394 | 236 | 0.60 | 317 | 0.81 | 65 | 0.17 | 553 | 1.41 |
| LFPl | 318 | 202 | 0.63 | 258 | 0.81 | 62 | 0.19 | 460 | 1.45 |



**For clinical medicine equal distribution of output, except LFHK and LFPl with lower outputs in top half papers. The higher bars of FaF HK is explained by the low number of self allocated authors /researchers with a multidisciplinary focus (see caveat 1 above).**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Health sciences and others FORD** | |  |  |  |  |  |  |  |  |  |
| Unit | HC | Share Major | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A |
| 1. LF | 97 | 40.8% | 143 | 1.47 | 83 | 0.86 | 27 | 0.28 | 226 | 2.33 |
| 2. LF | 29 | 29.0% | 72 | 2.48 | 26 | 0.90 | 4 | 0.14 | 98 | 3.38 |
| 3. LF | 43 | 43.4% | 47 | 1.09 | 33 | 0.77 | 2 | 0.05 | 80 | 1.86 |
| FaF HK | 22 | 32.8% | 24 | 1.09 | 9 | 0.41 | 2 | 0.09 | 33 | 1.50 |
| LFHK | 21 | 41.2% | 36 | 1.71 | 28 | 1.33 | 0 | 0.00 | 64 | 3.05 |
| LFPl | 22 | 29.3% | 24 | 1.09 | 22 | 1.00 | 4 | 0.18 | 46 | 2.09 |

**beiliegend die unterschriebene:Dokumente:2020 Charles University:Statistics:Documents to work with:Individual reports:FORD comparson:ford_health_sciences.pdf**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CUNI Field: Other Medicine And Health Sciences** | | | |  |  |  |  |  |  |
| Unit | HC | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A |
| 1.LF | 179 | 171 | 0.96 | 139 | 0.78 | 46 | 0.26 | 310 | 1.73 |
| 2.LF | 64 | 49 | 0.77 | 37 | 0.58 | 7 | 0.11 | 86 | 1.34 |
| 3.LF | 55 | 60 | 1.09 | 48 | 0.87 | 1 | 0.02 | 108 | 1.96 |
| FTVS | 44 | 19 | 0.44 | 27 | 0.62 | 2 | 0.05 | 46 | 1.06 |
| LFHK | 41 | 22 | 0.54 | 56 | 1.38 | 0 | 0.00 | 78 | 1.93 |
| LFPl | 34 | 33 | 0.98 | 29 | 0.86 | 3 | 0.09 | 62 | 1.83 |
|  |  |  |  |  |  |  |  |  |  |



**The interpretation is also biased by the caveat 1 with low proportion of major authors shares, which migh benefit the the average papers/author ratio.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CUNI Field: Pharmacy And Toxicology** | | |  |  |  |  |  |  |  |
| Unit | HC | >50% | P/A | <50% | P/A | Top 10% | P/A | Total | Total P/A |
| 1.LF | 16 | 45 | 2.78 | 51 | 3.15 | 1 | 0.06 | 96 | 5.94 |
| 2.LF | 8 | 6 |  | 3 |  | 0 |  | 9 |  |
| 3.LF | 6 | 13 |  | 6 |  | 0 |  | 19 |  |
| FaF HK | 158 | 195 | 1.23 | 188 | 1.19 | 12 | 0.08 | 383 | 2.42 |
| LFHK | 15 | 37 | 2.47 | 29 | 1.93 | 1 | 0.07 | 66 | 4.40 |
| LFPl | 11 | 4 | 0.36 | 11 | 1.00 | 1 | 0.09 | 15 | 1.36 |



**E. International collaboration and visibility**

The medical faculties in their self-assessment reports presented examples of internationally recognised scholars. The importance of some of these listings is difficult to assess but overall there is evidence that all assessment units are internationally connected and have some degree of international recognition. There are several examples of high calibre individual awards (e.g. Prof Widimsky at LF3 and Prof Svec at FaF HK) indicating very solid international reputation. Several CUNI academics are editors of high quality journals and further members of staff are members of editorial boards.

LF1: The self-evaluation report lists examples of 10 persons serving on editorial boards of international journal; a number of invited lectures in both directions (~10 good examples provided); 10 examples of significant elected members of international societies.

LF2: The self-evaluation report suggests 10 persons serving on editorial boards of international journal; invited lectures in both directions (~10 examples provided); 10 examples of significant elected members of international societies.

LF3: Self-evaluation lists 3 personal international awards, and gives examples of 8 persons serving on editorial boards of international journal; invited lectures in both directions (a few (4+5) examples provided); 5 examples of significant elected members of international societies.

LF Pilsen: The self-evaluation report suggests 10 persons serving on editorial boards of international journal; invited lectures in both directions (~10 examples provided); 10 examples of significant elected members of international societies.

LFHK: Self-evaluation lists 2 international personal awards, and gives examples of 8 persons serving on editorial boards of international journal; examples of 10 invited lectures in both directions (10+10) provided; 10 examples of members of international bodies given.

FaF HK: Self-evaluation lists 2 international awards, and gives examples of 8 persons serving on editorial boards of international journal (1 person serves in 3 boards, editor in chief in 2 journals); examples of 10 invited lectures in both directions (10+10) provided; 2 examples of members of international bodies and 5 examples of membership in professional Czech societies given.

**Collaboration**

Each faculty reported guest lectures of CUNI staff at international universities and vice versa. Each assessment unit also reports receiving funding for international collaborative projects, but the distribution among the 6 assessment units is very unequal. By far, the most international projects have been conducted at LF1, andthe funds raised by the conducted projects have also been the highest (2 million €). The collaboration of assessment units outside Prague has been very modest (see section 3 for more detail). There are also some international collaborations without additional funds (e.g. informal research networks).

One imperfect measure of international collaborations, and of the importance of CUNI partners in such collaborations, is the proportion of papers of CUNI authors who were first or last authors in scientific papers. Table E.1 and Figure E.1 below show the proportion of papers with CUNI staff as a first or last author, by journal category. While this comparison is affected by the fact that many papers, particularly in lower impact journals, were by CUNI authors only, it is striking that only 21% of papers with CUNI co-authors in D1 category had a CUNI author as first or last author (the majority of papers with CUNI participation in D1 journals were international collaborative papers). This share was increasing with declining journal importance, so that 80% of papers published in D4 journals had CUNI authors as first or/and last author. This suggests that in CUNI academics are relatively unlikely to lead the research reported in high quality journals.

**Table E.1.**

**Numbers (%) of papers with CUNI staff as first or last author, by journal category.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Journal**  **category** | **No first no last** | | **First or last** | | **First and last** | | **Total** | |
| **n** | **%** | **n** | **%** | **N** | **%** | **N** | **%** |
| D1 | 686 | 79% | 91 | 10% | 96 | 11% | 873 | 100% |
| Q1 | 547 | 56% | 173 | 18% | 258 | 26% | 978 | 100% |
| Q2 | 648 | 35% | 439 | 23% | 786 | 42% | 1873 | 100% |
| Q3 | 330 | 25% | 326 | 24% | 679 | 51% | 1335 | 100% |
| Q4 | 431 | 20% | 506 | 23% | 1217 | 57% | 2154 | 100% |
| **Total** | **2642** | **37%** | **1535** | **21%** | **3036** | **42%** | **7213** | **100%** |

**Figure E.1.**

**Proportion of papers with CUNI staff as a first or/and last author, by journal impact category.**



There were some differences between faculties (Figure E.2). The proportions of authors listed as first or/and last authors in higher impact journal were smaller for LF1 and LF2 and very high for FaF HK. Although we need to keep in mind that the absolute numbers of papers were smaller for the other faculties, they seemed to have higher proportion of first/senior authors in high quality journals, paarticulalry FaF HK. This may potentially suggest that some of these other faculties either publish more high impact papers without extensive collaborations or they may play a more significant roles in international scientific collaborations.

**Figure E.2.**

**Proportion of papers with CUNI staff as a first or/and last author, by journal category and by faculty (1=LF1, 2=LF2, 3=LF3, 4=LJHK, 5=LFPL, 6=FaF HK)**



In addition to these activities, most assessment units report student / junior researchers stay in foreign institutions. While this is a good practice, it is difficult to judge the quality or contributions of such study stays. There are also examples of visiting professors and international postdocs.

**International competitive research grants/awards**

Overall, the numbers of international grants were small (48 in total across all units of assessment). Assuming that we understood the figures correctly, the total income from international competitive research grants over the reporting period was 2.78M Euro. This is rather small for a university of the size and ambition of CUNI. There were large differences between faculties – 1.LF for more than half of all international research grants (see table below). In addition, FaF HK received 15M Euro from 5 Research, Innovation and Education Operational Programmes from the Czech Ministry of Education; the funded by the European Regional Development Fund but these awards are for infrastructure rather than for research itself and they are not internationally competitive.

LF1: About 29 international projects, 11 of them from FP7/H2020, all of them as partners (none as PI), total income 2.2M euro.

LF2: 7 international projects, most of them EU institutions, 2 of them H2020, no project as PI, total income 0.25M euro. There was some contracted research for foreign agents.

LF3: 4 international projects, all FP7 or H2020, total income 0.23M Euro, none as PI.

LFHK: 3 international project, one of them FP7, total income 0.04 M euro, one project as PI.

FaF HK: 3 international projects, 2 from FP7, none as PI, total income 0.02M euro. (In addition, FaF HK received 15M Euro from five Research, Innovation and Education Operational Programmes from the Czech Ministry of Education; the funded by the European Regional Development Fund)

Pilsen: no major international award. Participates in HBM4U project (invited by the Czech PI), negligible income.

**Table: International competitive research grants by faculty during reporting period**

|  |  |  |  |
| --- | --- | --- | --- |
| **Faculty** | **Total number of grants** | **Of them FP7/H2020** | **Total value**  **(M euro)** |
| LF1 | 29 | 11 | 2.2 |
| LF2 | 7 | 2 | 0.25 |
| LF3 | 4 | 4 | 0.23 |
| LF Pilsen | 2 | 0 | 0.04 |
| LF HK | 3 | 1 | 0.04 |
| FaF HK\* | 3 | 2 | 0.02\* |
| **Total** | **48** | **20** | **2.78** |

\*In addition, FaF HK received 15M Euro from 5 Research, Innovation and Education Operational Programmes from the Czech Ministry of Education; the funded by the European Regional Development Fund.

**Recommendations**

While there are members of CUNI staff with good international links and memberships in editorial boards and other bodies, the number of international research collaborations of all assessment units is small. There also is an indication that in most of these collaborations CUNI researchers do not play a leading role.

The low participation in EU research programmes is particularlydisappointing . It is difficult to achieve a high successful rate in applications for competitive funding (currently CUNI holds 8 ERC grants) or leading international consortia (80 FP7, H2020 projects, 20 among them are Marie Skłodowska Curie projects), but should be possible to participate as partners in such consortia (H2020, Horizon Europe). This may be a realistic way to build international visibility and recognition. CUNI staff with existing international connections will be instrumental to help their institutions to increase their participation in international projects.

1. **Environment for junior researchers and PhD students**

All CUNI medical schools and the Faculty of Pharmacy provide PhD training, and there are a number of schemes and some funding additional to the national support for PhD students. Depending on unit assessment, students have opportunities to gain experience abroad, often using the European Erasmus scheme. Most students work with senior researchers or teams. Some faculties operate specific recruitment schemes for recruiting PhD students and (less often) for retaining good students but this is restricted by lack of funding.

However, there is a striking lack of postdoctoral positionss in all assessment units; in 2018, there were only 7 postdocs across the five medical schools.

LF1 – operates 22 doctoral programmes. PhD students join research teams and may participated in international mobility (585 students used Erasmus scheme in 2014-18). No fees for students studying in English. The overall completion rate (~35%) but it is substantially higher in medicine (80%). There is some additional funding for a few projects / students.

LF2 – PhD participate in a programme organised jointly by the three Prague’s medical schools, Faculty of Science and Academy of Sciences. 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 sent for international experience.

LF3 – PhD students are supervised by independent committees, there are research fellowships to abroad for PhD students and postdocs, special budget for Phd student (1 per year) and postdoc recruitment (6 recruited)

LF Pilsen – 190 postgraduate students in 2018, several foreign PG students. English language programme, foreign stays, most PhD students have PT appointment in projects, low incomes of PhD students is a problem. Several international postdocs have been listed.

FaF HK –operates 8 doctoral programmes (in English !). Admission is open to graduates of university studies of pharmacy (or related fields such as medicine or natural sciences) who has acquired a Magister (Mgr.) or Master (MS) degree or its equivalent. The Faculty wants to motivate successful graduates and has increased the basic scholarship CZK 15,000 per month. Students are entitled to **extraordinary scholarships for research publications** that may range from several hundreds to thousands Czech crowns depending on the quality of the journal that published their article. Most full-time doctoral students join national and international research projects at the faculty soon after they commence their studies. the Faculty of Pharmacy in Hradec Králové has the highest success rate of their doctoral degree programme students both within Charles University.

**Table F.1.**

**Numbers of postdocs and PhD students in 2018 by faculty.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Postdocs** | **All PhD students** | **Foreign PhD\* students** |
| LF1 | 0 | 888 | 55 |
| LF2 | 0 | 338 | 21 |
| LF3 | 7 | 307 | 18 |
| LF HK | 0 | 227 | 8 |
| LF Pilsen | 0 | 186 | 7 |
| **FaF HK** | **0** | **148** | **25** |
| **Total** | **7** | **2094** | **134** |

\*Students with nationality other than Czech or Slovak.

Self-assessment says very little about undergraduates. PhD students, by definition, carry out research projects, but it is unclear whether they are integral parts of senior research teams and what is the quality of the research produced by PhD students.

It is difficult to assess the quality of PhD training. There are formal requirements and courses PhD have to take. There are also requirements on number of publication with IF but it could be any IF, the quality of the training is difficult to assess.

The self-assessment documents listed a few successful examples but whether this applies to nearly 2000 students registered in 2018 is unclear. Only one self-assessment (LF3) mentioned an effort to retain good PhD students.

**Conclusions**

The numbers of PhD students seem reasonably high but the quality of the training and of the research they undertake is difficult to assess. There does not seem any systematic effort to retain the best PhD students at the university. There are very few postdocs in all CUNI medical schools and Faculty of pharmcy; this is possibly related to low retention of good PhD students. While the low number of postdoc positions is probably related to lack of funding, one should consider that even internationally much of the research work often depends on having sufficient number of junior staff dedicated to research (i.e. full time on research). It is unrealistic to expect junior staff employed on clinical appointments to be able to conduct high quality research in their spare time.

1. **Summary, Conclusion, Recommendations**

Considering the sub-optimal financial resources, the workload in teaching and clinical duties of academical staff, the overall research output of the Medical faculties of CUNI is remarkable. There is a potential for improvement to match with benchmark universities;

* Increase amount of institutional grants to allow long term strategic planing of research programs by financing postdocs and PhD's
* Stimulate collaboration among the five faculties focusing on multi-center 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.

For future assessment of the output the WoS categories should be used for Bibliometric support to allow comparison with any University. The self-assignment create confusions (WoS, FORD, CUNI)

Additional recommendations

1. The Panel did not evaluate participation in studies funded by pharmaceutical companies, but increased collaboration with industry has the following advantages:
   1. Increased exposure to new medications and technologies
   2. Collaboration in multi-center clinical trials
   3. Exposure to academic leaders in various fields
   4. Financial gain that can be recycled into personnel costs and research.

It is important that the university adopts rules that makes participation in clinical trials financially worthwhile for investigators in terms of either supporting their salary or their research. Each faculty should have an office that alleviates the burden of initiating and performing clinical trials. As funding by governments decreases, industry funding becomes increasingly important.

1. Speaking Czech as a primary language and historically having limited English education leads to difficulties in publishing and submitting grants in English. Faculties should have ample resources available for teaching English as well as assistance in translation for manuscripts and grants.
2. Increasing the international prestige is dependent on the quality of work produced but also on the perception of others. The university should consider a formal approach to this issue. Possible methods to increase international recognition would include:
   1. Holding international conferences, perhaps with sponsoring from the government or pharmaceutical companies.. The university should leverage this to help improve its international recognition.
   2. Branding of clinical trials such as the Prague trials would be extremely helpful.
   3. Regular invitation of thought leaders in various areas to improve relationships and lead to networking and opportunities. Visiting professorships that are standardized and strategically planned to improve collaborations.
   4. Consider forming a board of advisors for Medicine with representatives from leading European universities to learn what is new in these universities and enhance collaboration and networking.

1. Petr Widimsky, Ales Linhart, Josef Veselka, Richard Rokyta, and Josef Stasek. Current cardiovascular research at the Charles University: The ‘PRAGUE’ trials and beyond. Eur. Heart J. Suppl. 2020; 00, 1–8 [↑](#footnote-ref-1)