Habilitation Board Decision on the Nomination for Appointment to Associate Professor

Masaryk University	
Faculty	Faculty of Science
Procedure field	Biochemistry
Applicant	Mgr. Zdeněk Farka, Ph.D.
Applicant's home unit, institution	Faculty of Science, Masaryk University
Habilitation thesis	Advanced Immunochemical Biosensors and Assays: From Label-Free to Single-Molecule Detection
Board members	
Chair	prof. RNDr. Michaela Wimmerová, Ph.D. *CEITEC, Masaryk University*
Members	doc. Ing. Martin Mandl, CSc. *Faculty of Science, Masaryk University* prof. RNDr. Zuzana Bílková, Ph.D. *Faculty of Chemical Technology, University of Pardubice* Assoc. Prof. Jan Halámek, Ph.D. *Department of Environmental Toxicology, Texas Tech University, USA* Prof. Niko Hildebrandt, PhD *Université Paris-Saclay, France*

Evaluation of the applicant's scholarly/artistic qualifications

Dr. Zdeněk Farka graduated in Biochemistry from Faculty of Science, Masaryk University, Brno, Czech Republic. He received his Ph.D. degree in Structural Biology (Life Science Programme) from the same institution in 2017 for the work “Bioelectronic interfaces studied with scanning probe microscopy”. He received Dean’s Award for the best students in doctoral programmes, CEITEC MU Award for extraordinary scientific contribution for young scientists under the age of 35, the Shimadzu Award for young chemists and biologists and the Jean-Marie Lehn prize for chemistry. After his PhD, he continued his scientific work as a researcher in the Nanobiotechnology Research group at CEITEC Masaryk University held by prof. Petr Skládal. In 2020, Dr. Farka was appointed as Assistant Professor at the Department of Biochemistry, Faculty of Science, Masaryk University, Brno. Within the years 2016-2020, he underwent four stays at the University of Regensburg, Germany, in a total of 10 months.

His research is focused on bioaffinity and biocatalytic sensors, mainly based on immunochemical sensors. Recently, he has turned his attention to nanoparticle-based biosensors, focusing primarily on photon-upconversion nanoparticles (UCNP). He is interested in the methodological aspects of the techniques and their application for the detection and monitoring of clinically important molecules and harmful agents, including viruses, bacteria, and other toxins.

The habilitation application is based on 38 publications (with significant contributions in Q1 and Q2 quartiles), 6 technically realized results, 2 editorships of special issues of proceedings from conferences. The work is highly cited, currently represented by citations exceeding 1000 citations (the most cited review received more than 350 citations for 5-year lifetime), with almost 70 % of citations in Q1 journals.

Dr. Farka is the corresponding or co-corresponding author on 14 of them, 15 times being as the first author. It must be noticed that the presented work was published over the period of 7 years. The most important information seen from the bibliography record is the dynamic increase in citations of his work during the time.

Dr. Farka is also PI or co-PI of three projects from the Czech Science Foundation, Technology Agency of the Czech Republic and Ministry of Education, Youth and Sports.

Conclusion: The applicant's scholarly/artistic capabilities **meet** the requirements expected of applicants participating in a habilitation appointment procedure in the field of Biochemistry.

Evaluation of the applicant's pedagogical experience

Dr. Zdeněk Farka started his teaching activities as a PhD student participating in courses Special biochemical Methods - practice (4 semesters), Methods in Biophysical Chemistry – seminar (4 semesters). His more extensive involvement in pedagogical activities relates to his appointment as the Assistant professor at the Department of Biochemistry. Currently, he is involved in the following classes at bachelor and master levels: since 2020 in Biochemistry – laboratory course, and Methods of biochemical research, since 2021 Biochemistry I – seminar, and recently also Biochemistry II – seminar. He has supervised 8 bachelor and 4 master students.

The teaching activities of the applicant is relatively short, so it is difficult to evaluate his pedagogical experience fully. However, based on the survey results of the School course opinion poll held every semester at the university, Dr. Farka’s performance in the courses is generally well evaluated among students. The comments from students are rather positive, highlighting his abilities to explain the grounds of the taught topic.

Conclusion: The applicant's pedagogical capabilities **meet** the requirements expected of applicants participating in a habilitation appointment procedure in the field of Biochemistry.

Habilitation thesis evaluation

Single-Molecule Detection" is a collection of 22 scientific papers addressing several questions in biochemistry and sensoring. The thesis concentrates on developing and applying immunochemical biosensors to monitor various analytes, from small molecules to proteins, up to bacteria. The thesis has been reviewed by three external reviewers: Assoc. prof. Tomasz Grzyb (Adam Mickiewitz university, Poznań, Poland), Ján Tkáč, DSc. (Institute of Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia), and Associate Professor Lucie Korecká (University of Pardubice, Czech Republic). In their reports, all three reviewers appreciated the significant scientific contribution of dr. Farka. They highlighted mainly the impact of his work on the upconverting nanoparticles, which represent considerable potential for future applications. The answers to the reviewers' questions were answered in written form; all reviewers expressed satisfaction with the presented responses. Additional questions were also answered directly during the public habilitation lecture, where two reviewers were presented remotely. All three reviewers supported awarding Dr. Farka by the academic title Associate Professor in Biochemistry.

In summary, the applicant's habilitation thesis meets the requirements expected of habilitation theses in the field of Biochemistry. The proposal for appointment as associate professor takes into account in particular his outstanding scientific achievements in qualitative and quantitative parameters, even during a short period of experience.

Conclusion: The applicant's habilitation thesis **meet** the requirements expected of habilitation theses in the field of Biochemistry.

Habilitation Board Decision on the Nomination for Appointment to Associate Professor

Secret vote results

Voting took place: electronically

Number of board members		5
Number of votes cast		5
of which	in favour	5
	against	0

Board decision

Based on the outcome of the secret vote and following an evaluation of the applicant's scholarly or artistic qualifications, pedagogical experience and habilitation thesis, the board hereby submits a proposal to the Scientific Board of the Faculty of Science of Masaryk University to **appoint the applicant associate professor** of Biochemistry.

In Brno on 14.10.2022

prof. RNDr. Michaela Wimmerová, Ph.D. .....