

<b>Masaryk University</b>	
<b>Faculty</b>	Faculty of Medicine
<b>Procedure field</b>	Pathological Physiology
<b>Applicant</b>	MUDr. Jaromír Gumulec, Ph.D.
<b>Applicant's home unit, institution</b>	Faculty of Medicine, Masaryk University
<b>Habilitation thesis</b>	Interplay between aggressive prostate cancer metabolism and biomechanics
<b>Board members</b>	
<b>Chair</b>	prof. MUDr. Kateřina Kaňková, Ph.D. <i>Faculty of Medicine, Masaryk University</i>
<b>Members</b>	prof. MUDr. Martin Vokurka, CSc. <i>1. LF UK Praha</i> doc. Mgr. Petr Beneš, Ph.D. <i>Faculty of Science, Masaryk University</i> prof. Dr. Michael Hausmann <i>Experimentelle Biophysik, Kirchhoff-Institut für Physik, Universität Heidelberg</i> prof. Ing. Jiří Burša, Ph.D. <i>Ústav mechaniky těles, mechatroniky a biomechaniky, Fakulta strojního inženýrství VUT</i>

### Evaluation of the applicant's scholarly/artistic qualifications

To date (1. 1. 2023) Jaromír Gumulec, M.D., Ph.D. is the first- or co-author of 85 articles in journals with impact factor listed in WoS with cumulative IF 301,7. Of this total, dr. Gumulec is listed 14 times as the first or corresponding author (of these 7 times in Q1 journals). Dr. Gumulec contributed to a chapter in monographies "Imaging Modalities for Biological and Preclinical Research: A Compendium", published by IOP Science and "Targeting Oral Cancer" published by Springer. Number of citations in WoS (as of 1. 1. 2023) is 2,523, H-index 27. Dr. Gumulec has been awarded by several external grants: once as a principal investigator from The Czech Health Research Council (AZV ČR), two times as co-investigator from Czech Science Foundation (GAČR). Dr. Gumulec has been awarded by the Minister of Education, Youth and Sports Award for outstanding students and graduates 2016, by Masaryk University Rector's award for outstanding postgraduate students in 2014 and in Conference competition "Student Scientific Conference of the Czech and Slovak Faculties of Medicine" in 2011. Dr. Gumulec also received a fellowship from the "Correlated Multimodal imaging in Life Sciences" European Cooperation in Science and Technology (COST) action in 2020 which allowed him to spend two months in Max Planck Institute for the Science of Light in Erlangen, Germany (in the lab of Prof. Guck)

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

### Evaluation of the applicant's pedagogical experience

Jaromír Gumulec, M.D., Ph.D. started his teaching activity soon after graduation at the Pathophysiology department, Faculty of Medicine, Masaryk University as junior assistant, after completing his Ph.D. thesis as an assistant professor. He has been involved in multiple courses – Pathophysiology (tutorials) and Neuroscience (lectures) for General Medicine and Dentistry (both Czech and English versions) from 2014 onwards, for bachelor programs (lectures on Morphological and Functional Pathology for Laboratory technicians, Pathophysiology for Nutrition specialists or Pathophysiology for Biomedical engineering & Bioinformatics) from 2014 onwards. He also cooperates on courses for students of the Faculty of Science, Masaryk University (Molecular Basis of Pathophysiological processes for bachelor and master students of Biochemistry). Dr. Gumulec supervised two bachelor and master student theses and served as a supervisor-specialist of the PhD student of the student of Brno University of Technology (T. Vičar) who defended his thesis in 2022. Currently, he is a supervisor of one doctoral student of Faculty of Medicine, Masaryk University (Mgr. Hánělová „Role of autophagy in the regulation of secretome in head and neck squamous cell carcinoma“). He is a member of the Ethics Committee for Biomedical Research and the state examination board for bachelor and master studies of Biomedical Engineering, Brno University of Technology (VUT). Dr. Gumulec is a co-author of two textbooks "Pathophysiology in images" and "Selected chapters from cell physiology".

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

### Habilitation thesis evaluation

Jaromír Gumulec, M.D., Ph.D. submitted his habilitation thesis with the title "INTERPLAY BETWEEN AGGRESSIVE PROSTATE CANCER METABOLISM AND BIOMECHANICS" which is written as a commentary to the core collection of 6 original papers representing Results plus 2 reviews nicely complementing Introduction. The entire thesis text is very concise and makes for an interesting reading convincingly documenting dr. Gumulec research expertise and broad methodological repertoire. Major findings of the thesis are challenging and provoking. Contrary to the shared opinion that invading cancer cells are generally more deformable the studied cancer type – prostate carcinoma –

documents that this is not the unified feature and that more rigid cell biomechanics accompanied by metabolic reprogramming might offer a selective advantage to this particular cancer type. Of note is the use of artificial intelligence in microscopic image analysis workflows. The committee especially values the quality of the published papers since they are published in prestigious journals with IF ranging from 3.3 to 7.3. All three reviewers provided very positive feedback and highlighted the methodological complexity of dr. Gumulec approach to cancer biomechanics.

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

### 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 Medicine of Masaryk University to **appoint the applicant associate professor** of Pathological Physiology.

In Brno on 13.01.2023

prof. MUDr. Kateřina Kaňková, Ph.D.

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