

REVIEW

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Regarding a competition for the academic position 'Professor' in the field of higher education 4. Natural Sciences, Mathematics and Informatics, Professional field 4.3. Biological sciences, specialty "Medical Biology", Faculty of Medicine, Department of Medical Biology, Medical University - Plovdiv, Bulgaria, announced in the State Gazette, N: 35 /19.04.2024

The reviewing of the materials submitted for the competition is based on the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for its implementation, as well as the Regulations for the Conditions and Procedure for Acquisition of Scientific Degrees and Holding Academic Positions at MU-Plovdiv.

The review is prepared on the basis of the Order No. P-2300/03.07. 2024 of the Vice Rector of MU-Plovdiv and Protocol No. 1 of the meeting of the scientific jury of 08.07.2024.

1. General presentation of the competition materials

For participation in the competition has submitted documents only one candidate - Maria Hristova Kazakova - Velinova, PhD - Associate Professor at Medical University - Plovdiv, Head of the Department of Medical Biology.

The set of materials submitted by the candidate on electronic media are in accordance with the recommended minimum scientific-metric requirements for academic positions in the Regulations of MU-Plovdiv.

2. Career Development

Maria Kazakova graduated in 2005 from P. Hilendarski University as a bachelor in molecular biology, and in 2006 she obtained a master's degree in cell biology. From 2005 to 2007 she worked as a biologist at the Department of Developmental Biology of the same university. After successfully passing a competitive examination in 2007, she was appointed as an assistant professor in the Department of Medical Biology of Medical University - Plovdiv. In parallel with her teaching work, she was a PhD students in immunology, and successfully defended her PhD thesis in 2013.

In the same year she acquired a specialty in medical biology, and the following year she was appointed as a senior assistant professor. In 2015, she was promoted to the post of Professor of Biomedicine.

M. Kazakova also graduated as a Master - Manager of Applied Research at P. Hilendarski University. Since 2016, she has been a full-time associate professor of medical biology, and since 2024, the head of the department of medical biology.

In the course of her professional career, she has continuously improved her qualification by participating in international trainings such as EFIS Advanced course "Innate Immunity 2012: from Evolution to Revolution", 2012, Sorrento, Italy and "Novel vaccination strategies against the three major killers", 2013, Castellammare di Stabia, Italy. The two-month EFIS fellowship at the University of Catania significantly enriched and enhanced her skills in the biology and biochemistry of proinflammatory molecules.

In conclusion, Assoc. Kazakova followed a well-defined and straightforward path for academic development and realized her potential as a teacher and supervisor in a short time. She is a researcher with serious training and clearly defined professional interests. At the same time, she is involved in administrative activities and scientific supervision of PhD students and postgraduate students.

3. General description and evaluation of the applicant's activities

- Teaching and expert activities

Assoc. M. Kazakova has 16 years of teaching experience in MU-Plovdiv. The average teaching workload for the last 4 years is 943 h. The teaching work includes lectures and exercises in Bulgarian and English to first year students in the following specialties: medicine, dentistry, pharmacy, assistant pharmacists and physician assistants. As an Erasmus lecturer she has realized mobilities in University Campus Bio-Medico, Rome, Italy.

She has been an examiner of the biology competitive entry examinations at MU-Plovdiv since 2008. Since 2023 she is the chair of the biology examination committee in Bulgarian and English. She participates with opinions and reviews in scientific juries for the acquisition of PhD and academic positions.

Under the supervision of Assoc. Kazakova has defended one PhD student - Valentin Dichev (2022). She is also the supervisor of another regular PhD student - Valentina Mihaylova. Both theses are in the field of her scientific research on inflammatory markers in rheumatological diseases. In addition to supervising PhD students, she also supervises postgraduate students in medical biology.

Holding the academic position of "professor" requires not only strong scientific metrics, but also experience in teaching. In this respect, the candidate has made no small contribution. She has co-authored 20 (11 after getting the position of Associate Professor) textbooks on medical biology and parasitology. All the mentioned textbooks and one textbook on parasitology in English are currently used in teaching at MU-Plovdiv. He is also involved in 3 biology textbooks for prospective students. They are helpful for high school students and biology candidates in higher medical schools.

Over the years she has gained experience in developing and delivering in Bulgarian and English a lecture course in medical biology, preparing teaching aids, illustrating and conducting practical exercises in biology and parasitology

for students of pharmacy, medicine and dentistry. She helped the updating of the syllabus and in the preparation of examination tests for the discipline.

- **Research activity**

Assoc. Kazakova is a researcher with a clear scientific profile. The realization of her significant scientific output is based on the funding of 7 intra-university projects, 3 of which she is the leader and in the others - a team member.

After her habilitation in 2008, she continued to work on 5 projects at the Bulgarian national Science Fund. For one of them she was the supervisor and it was successfully completed with a very good evaluation. The study she led on molecular signatures and cell metabolism in neurodegenerative and neuroinflammatory diseases was awarded in the project session of MU - Plovdiv for innovative projects with European funding in 2024.

She is also the leader of a working group in an international COST action on osteoarthritis.

The scientific topic of Assoc. Kazakova's research is focused on several areas in which she works in a team of members of the Department and scientists from other units. The main topic, which started with the PhD and continues successfully up to now, is related to biomarkers and molecular signatures in inflammation and tumorigenesis. Its main focus is on the glycoproteins YKL-40 and LAMP-1 and LAMP-2.

In the course of long-term studies, original results have been obtained that propose a novel mechanism for the regulation of YKL-40 by miRNA-214 in patients with systemic sclerosis based on *in silico* and *in vitro* experiments in blood samples. Also, a mechanism for the control of YKL-40 synthesis involving a gene regulatory axis of long-chain non-coding RNAs, miRNAs and YKL-40 mRNA in the same pathology is proposed.

Following her PhD, which mainly investigated rheumatological diseases, the candidate's interests also focused on tumour processes. For the first time, the clinical relevance of tissue expression of YKL-40 as a prognostic marker in

metastatic colorectal cancer was investigated and it was shown that strong expression of YKL-40 in the tumor front in CRC can serve as a prognostic indicator.

Other glycoproteins with debatable function are LAMP-1 and LAMP-2, for which high gene and protein expression of LAMP-1 has been shown to be associated with tumor progression in high-grade gliomas. They have also been studied in colorectal tumors.

A new direction, which Assoc. Kazakova has been developing in recent years in an interdisciplinary team, is focused on cell biology and cell metabolism in various pathologies. For the first time, the biological action of novel fluorenyl spirohydantoin, the structure and biological properties of substituted fluorenyl spirohydantoin were determined in collaboration with chemists from P. Hilendarski".

Metabolic profile in patients with autism spectrum disorder and changes in mitochondrial activity in a Bulgarian cohort and correlation with YKL-40 levels in a pediatric team are reported for the first time.

In collaboration with neurologists, mitochondrial activity in patients with Parkinson's disease was studied which was shown to improve after treatment.

A long-standing collaboration with rheumatologists continues to focus on mitochondrial dysfunction in isolated PBMCs from newly diagnosed rheumatoid arthritis patients, which is also the topic of the Kazakova's PhD thesis.

The candidate entered the competition with publications equivalent to a habilitation thesis in journals that are refereed and indexed in world-renowned databases of scientific information - 2 articles in Q1 (J. Mol. Neurosci., 2020; Int. J. Mol. Sci., 2022) and 3 articles in Q2 (Brain Res., 2019; Rev. Neurosci., 2020; J. Neuroimmunol., 2022). Also included are 16 publications in scientific journals refereed and indexed in Scopus and Web of science, and 6 in non-refereed peer-reviewed journals.

The studies have been reported to the scientific community at 98 scientific congresses and conferences, of which 33 were international. Impressive is the number of projects in which M. Kazakova has participated - 24. Of these - 4 international, 9 national and 11 intra-university.

The most significant indicator of the value of the scientific results of each researcher are the independent citations. M. Kazakova have been cited 221 times, of which 119 were in the competition.

In conclusion, the research activity of Assoc. M. Kazakova is interdisciplinary and fruitful. In the course of these studies, the candidate has proved that she can work in a team, supervise collaborators and successfully implement project contracts.

4.Evaluation of the personal contribution and personal qualities of the candidate

I know Assoc. Prof. M. Kazakova as a scientific supervisor of her Ph.D. studies, and subsequently as the Head of the Department of Medical Biology. I have direct impressions of her daily work. She is a disciplined, responsible and organized researcher and teacher. She unflinchingly takes on commitments and challenges, which she executes rigorously and on time. Over the years she has proven to be demanding of herself and collaborators, ethical and collaborative. I believe that as the head of the department, she will successfully take it to the next level of development and uphold moral values in communication, scholarship and teaching.

The analysis of the documents submitted for the competition and my long personal impressions show that M. Kazakova is an excellently prepared specialist in biomedical science. She combines fundamental knowledge with laboratory skills and precision, has experience in scientific supervision of PhD students, in teaching work and in project funding. These competencies outline the profile of a

specialist in biomedical science. She combines fundamental knowledge with laboratory skills and precision, has experience in scientific supervision of PhD students, in teaching work and in project funding. These competencies outline the profile of a credible academic teacher and researcher who meets the requirements for the academic position of professor.

Analyzing the presented scientific production and comparing it with the scientific criteria set in the Regulations of MU-Plovdiv, the following data emerge:

Indicators	Minimal requirements	Assoc. Prof. Kazakova
A -1	50	50
B - 3 or 4	100	110
Г - 5 to 10	250	377
Д - 11	100	252
Е – from 12 till 20	150	394.29
Ж	560	1486
Total	1210	2 669.29

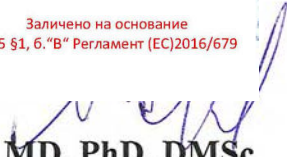
CONCLUSION

The documents and materials submitted by Assoc. Maria Hristova Kazakova - Velinova, PhD meet all the requirements of the Academic Staff Development Act in the Republic of Bulgaria (ASDA), the Implementing Rules of ASDA and the Regulations of MU-Plovdiv. Her research activity exceeds the minimum national requirements for holding the academic position "Professor".

The candidate has presented a sufficient number of scientific works, in which she has original scientific and applied contributions that have received international recognition. A representative part of them has been published in refereed and indexed journals or cited in such journals.

contained in them, I give my positive evaluation and recommend the Scientific Jury to award Assoc. Maria Hristova Kazakova - Velinova, PhD, the academic position "Professor" in the field of higher education 4. Natural Sciences, Mathematics and Informatics, Professional field 4.3. Biological Sciences, specialty "Medical Biology", at the Department of Medical Biology of Medical University of Plovdiv.

Заличено на основание
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July 18th, 2024

Professor Victoria Sarafian, MD, PhD, DMSc