

## OPINION

On a **competition to occupy academic position of Associate Professor**, Professional field: 4.3. Biological Sciences (Human Biology), announced in State Gazette No. 48/28.06.2022

By: **Assoc.Prof. Radoslava Vasileva Vazharova, MD, PhD**, lecturer at the Faculty of Medicine of Sofia University "St. Kliment Ohridski", an internal member of the scientific jury, determined by order of the Rector No. RD 38-500/24.08.2022.

The only candidate in the competition is **Lyudmila Filipova Belenska-Todorova, PhD** - chief assistant at the Department of Biology, Medical Genetics and Microbiology of the Faculty of Medicine, Sofia University "St. Kliment Ohridski".

### **Biographical data, academic and professional development**

Chief Assistant Lyudmila Belenska-Todorova was born in 1982 in the city of Sofia. She completed her secondary education with honors at II AEG "Thomas Jefferson", Sofia in 2000. In 2004, she obtained the educational and qualification degree of Bachelor in Molecular Biology from the Faculty of Biology of the SU "St. Kliment Ohridski" (A-03CY №Б172146, 09.2004), and in 2006 she acquired the educational and qualification degree "Master of Microbiology and Microbiological Control" (A-05CY № M180108; 02. 2006). Chief Assistant Lyudmila Belenska-Todorova has an additional specialization with the professional qualification "Teacher in Biology" (CY № 000583, 10.04.2007), and since 2014 - recognized specialty in "Medical Biology" (CY № 000004, 16.05.2014).

In 2016, she defended her doctoral thesis on the topic "The role of complement in the processes of joint destruction in experimental models of arthritis" and obtained the educational and scientific degree "doctor" from the Institute of Microbiology of the BAS, in Immunology, Professional field: 4.3. Biological Sciences (Diploma No: 000735 / 01.07.2016).

In the period 2006 - 2008, she worked as a correspondent at "FAKTOR-TS EOOD". After completing her higher education, from August 2008 until now, Lyudmila Belenska-Todorova has worked successively as an assistant professor, and since 2017 as a chief assistant professor in the Department of Biology, Medical Genetics and Microbiology of the Faculty of Medicine of SU "St. Kliment Ohridski". Along with her teaching and scientific activities, in the period November 2008 - January 2019, Lyudmila Belenska-Todorova worked as a specialist in medical biology at Lozenets Hospital, and since April 2019 she is a technical associate in the Laboratory for Molecular Diagnostics, Microbiology, Virology, parasitology and genetics of the Faculty of Medicine of the SU "St. Kliment Ohridski".

### **Scientometric data and research activity**

The scientometric data of the candidate, evaluated in their entirety, correspond to the criteria and indicators recommended in the normative documents for evaluation when holding a competition for "associate professor".

To participate in the competition, Ludmila Belenska-Todorova presents publications related to serious fundamental and scientific-applied developments in the field of medical biology and especially immunology, which are focused on analysis of the mechanisms of acute and chronic inflammation. Her scientific works include 2 monographs (one - habilitation thesis), 1 book based on a defended

dissertation work, 5 chapters in scientific textbooks, 8 scientific publications in refereed journals and 7 scientific publications in non-refereed journals. The scientific works submitted for participation in the competition are outside the dissertation work for the acquisition of the doctorate. The monograph on the topic "The complement system in inflammatory joint diseases" is presented as a habilitation work, in which the author competently analyzes the biology of the complement system, the ways of its activation, the amplification of the complement action, the final phase of the complement cascade and examines the role of complement in the pathogenesis of a number of joint diseases, such as osteoarthritis, rheumatoid arthritis, psoriatic arthritis, septic (infectious) arthritis, ankylosing spondylitis. The main contribution of the monograph is the gathered and described author's own results of research on experimental models of rheumatoid arthritis and osteoarthritis. The monograph presents methods used in research carried out by the author, for experimental analysis of serum complement activity, as well as for induction in animal models of inflammatory joint diseases, with special attention paid to a model of erosive zymosan-induced arthritis resembling rheumatoid arthritis in humans and a model of collagenase-induced osteoarthritis. Methodology and results of cell culture of bone marrow cells isolated from arthritic joints are also described. Another important contribution of the monograph is the analysis of therapeutic approaches that are the basis for future drug development and opportunities for future clinical trials.

Eight of the scientific publications are in journals referenced in world-renowned databases of scientific information, and 7 of them are with IF / SJR (total IF of articles with the candidate's participation is 20,701). Lyudmila Belenska-Todorova is the first author of three of the publications in the refereed journals, the second author of two, and the third and consecutive author in two of the publications.

The scientific works with the participation of the candidate are cited in 37 scientific publications, and all the citations presented for participation in the competition are in publications, referenced and indexed in world-famous databases with scientific information. Most of the citations are from the last three years, which shows the high interest and recognition of the candidate's scientific research achievements.

**The candidate's research and applied scientific activities** are in the field of medical biology, morphology and immunology, and the candidate demonstrates significant scientific achievements. The main areas of her scientific activity are: research on morphological characteristics in humans (dermatoglyphs, variations in the morphology of the vascular network); basic and applied research in the field of immunobiology, focusing on issues such as sepsis, acute and chronic inflammation, the complement system, animal models of some chronic joint diseases, approaches to modulating the immune response, the role of cells in innate and acquired immunity, cytokines and adhesion molecules in the occurrence and development of joint pathology.

The monograph presented as a habilitation thesis, which brings together modern achievements in the field of osteoimmunology for the role of complement in the pathogenesis of a number of joint diseases, has a serious scientific and applied contribution. The candidate's research on the pathogenesis of sepsis is also fundamental in that it sheds light on how the expression of various molecules affects the cell populations involved in sepsis, the development of multiple organ failure syndrome and mortality. Along with this, they also have a markedly applied nature for clinical practice in the search for quick and adequate therapeutic approaches to limit the damage that acute inflammation inflicts on the body and to increase survival in sepsis and septic shock. The scientific works presented by the candidate on the role of complement in the pathogenesis of arthritis, research on the role of apoptosis in the pathophysiology of sepsis and the influence of various hormones

(estradiol, FSH) on apoptosis, inflammation and bone-joint tissue remodelling are of a fundamental and applied contribution nature.

The research analyzed in the works presented for the competition are in areas that are included in the study program in the discipline "Human Biology" in the main sections: "Cell Biology and Immunology", "Genetics", "Developmental Biology and Ecology of Parasitism" and "Comparative Anatomy." This makes the presented works applicable in the competent practical and theoretical training of both medical students and in the supervision of post-graduate residents in specialty Medical Biology at Faculty of Medicine.

**Participation in research projects:** Assistant Professor Ludmila Belenska-Todorova participated in 11 research projects funded by various institutions (FNI of the Ministry of Education and Science; FNI of the SU), two of the projects are international, and in 2 projects with national funding the candidate was the project leader.

**Teaching activity:** Chief Assistant Professor Lyudmila Belenska-Todorova is a full-time lecturer in "Human Biology" in the Master's Programme of medicine and medicine in English, in the Faculty of Medicine of SU "St. Cl. Ohridski" and in "Microbiology, Parasitology and Virology" in the Bachelor's Programme "Nurse" at the Faculty of Medicine of SU "St. Cl. Ohridski". As can be seen from the report provided for the period 2016-2021, the candidate has a total teaching workload of 2656.1 hours, of which 2531 hours are classroom employment.

**Membership in scientific and professional organizations:** Union of Scientists in Bulgaria, Society for Medical Biology in Bulgaria

**Compliance with the minimum national requirements** for candidates for obtaining a scientific degree and for holding an academic position "**associate professor**" in professional direction 4.3. Biological Sciences (Human Biology)

Group of indicators	Content	Minimum number of points for "associate professor"	Chief Assistant Professor Lyudmila Belenska-Todorova, PhD
A	Indicator 1	50	<b>50</b>
Б	Indicator 2	-	-
B	Indicator 3	100	<b>100</b>
Г	Sum of indicators from 5 to 9	200	<b>265</b>
Д	Sum of indicators from 10 to 12	50	<b>74</b>
E	Sum of indicators from 13 to the end	-	<b>150</b>
Total		400	<b>639 points</b>

## **Conclusion**

The scientific-research, teaching, project and scientific-applied activities of chief assistant Lyudmila Belenska-Todorova, PhD show an extremely high competence in the field of medical biology, morphology and immunobiology. Her scientific works have made a significant contribution to clarifying key aspects in the field of immunobiology of acute and chronic inflammation. She is a responsible and serious teacher with solid professional training.

The submitted documents for participation in the competition by chief assistant Lyudmila Belenska-Todorova, PhD, not only meet, but also exceed the minimum national requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria, Rules for the Implementation of Act for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the terms and conditions for acquiring scientific degrees and occupying academic positions at SU "St. Kliment Ohridski" for occupying the academic position "Associate Professor" in professional field 4.3. Biological Sciences (Human Biology).

**I give a positive assessment and strongly support Chief Assistant Professor Ludmila Belenska-Todorova, PhD, to occupy the academic position of Associate Professor in professional field 4.3. Biological Sciences (Human Biology) at the Faculty of Medicine of the Sofia University "St. Kliment Ohridski".**

Signature:

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