

OPINION

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Subject: applications for participation in a competition for the academic position "Associate Professor" in the scientific specialty "Immunology", professional field of Biological Sciences, field of higher education Natural Sciences, Mathematics and Informatics.

The competition is open in the Department of Immunology, Institute of Microbiology "Acad. Stephan Angelov", BAS, Sofia, Bulgaria. It was announced in the State Gazette issue 20 / 09.03.2021.

I present the following evaluation as a member of the scientific jury in the above-mentioned competition according to the decision of the Scientific Council of Institute of Microbiology (Protocol 17/22.04.21) and order № I-39/23.04.21 of the Director of the Institute. This evaluation has been prepared according to the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations for its implementation and the Regulations for the Development of the Academic Staff of the Institute of Microbiology and BAS.

The only candidate allowed to participate in the competition is Dr. Nikolina Mihaylova. The documents submitted by the applicant are complete and precisely organized. I declare that I have no common publications with the candidate.

I. Assessment of the applicant based on the publications and professional activities submitted for consideration under this procedure.

1. Brief biographical data about the candidate

Dr Nikolina Mihaylova was born in 1980. She graduated with a bachelor's degree in biology from the Faculty of Biology at Sofia University in 2003, and in 2005 she defended master's degree in Cell Biology and Pathology at the same university. In 2008 Nikolina Mihaylova defended a PhD thesis titled "Immunomodulatory activity of new experimental IgM and IgG preparations". As a PhD student she was supervised by Prof. Chavdar Vassilev, a prominent scientist in the field of immunology, which is a warranty for successful academic career. During her doctoral studies Nikolina Mihaylova specialized in the team of Dr. Srinivasa Kaveri, INSERM Institute, Paris, France. She is a member of the Union of Scientists in Bulgaria, Immunology Section and of the European Federation of Immunological Societies - EFIS. Her further career took place in the Department of Immunology at Institute of Microbiology, a place known for its high level and hot topics research and outstanding researchers.

2. Research activity

The general publishing activity of Dr Mihaylova includes 36 publications. To participate in this competition, she has submitted 22 scientific publications and 1 chapter of a book that have not been reviewed in previous competitions for academic degree or position. Of the 22 publications submitted, 20 articles were published in scientific journals referenced and indexed in the databases Web of Science and Scopus with an impressive total impact of 61,011 and 2 articles were published in non-referenced scientific peer-reviewed publications. Of the proposed 23 publications - in 6 publications (26%) the candidate is a first

author. All submitted articles are in the field of the competition. In total, 256 citations were mentioned, of them 102 citations related to the articles for this competition. All this comes to show high scientific value of the candidate's work. Nikolina Mihaylova's project activity is also impressive. She has participated in 12 national research projects, of which 8 are funded by Bulgarian Science Fund, 3 - by the Operational Programs of the Structural Funds and 1 - by the Program for Support of the Young Scientists and Doctoral Students - BAS. She has taken part in 2 international research projects funded by the Pasteur Institutes Network. She has led one and is currently leading a second national research project, both funded by the Bulgarian Science Fund. As a PhD student, Nikolina Mihaylova received a number of awards, distinguishing her as a promising young scientist such as "Autoantibody Research" Award (Dresden, 2004), "Young Scientist Award" (8th International Lupus Congress, 2007), "Stephan Angelof Foundation" Award for Young Microbiologist (2008). He is also the winner of "Ivan Evstatiev Geshov award" for a young scientist up to 30 years in the field of biological sciences (2009), given by BAS. In 2017 she was awarded "Prof. Marin Drinov award" for young scientist in the field of biological sciences (2017), also given by BAS.

II. Fulfillment of the requirements for holding the academic position

Dr Mihaylova fulfills the requirements for holding the academic position of "Associate Professor", defined by the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations for its implementation, by the Regulations of BAS and by the Regulations for the Development of the Academic Staff of the Institute of Microbiology and BAS. Her candidacy not only complies, but also many times exceeds the minimum national requirements under Art. 2b, par. 2 and par. 3 of the Law, according to which the required number of points is 400, according to the criteria of the Rules of BAS - the points are 430. The candidate has 914 points. As I have already mentioned, she exceeds the additional requirements of the Regulations of the Institute of Microbiology. According to them, the academic position "Associate Professor" requires an impact factor of 20 for the entire career so far, h-factor 5 and participation in at least 3 projects. Dr Mihaylova has impressive impact factor - 93,672, h-factor 9 and 12 projects, respectively. Sixty nine participations in national and international scientific forums were also reported.

III. Area of scientific interests and assessment of contributions

The main scientific contributions of Dr Nikolina Mihaylova's research could be summarized as follows:

1. Selective influence of pathological autoreactive cells by protein-engineered antibodies and by monoclonal antibodies in mouse and human models of autoimmunity.

Nearly half of the submitted publications are dedicated to the topic - 12 out of 22. These studies test specific approaches for treatment of the autoimmune diseases systemic lupus erythematosus (SLE) and type 1 diabetes and present therapeutic approaches against both autoimmune B- and T-lymphocytes. These treatments are based on an innovative approach to selectively suppress primarily autoreactive B-lymphocytes by constructing protein-engineered chimeric molecules, including an antibody specific for B-cell inhibitory receptor and conjugated antigenic peptides. Also, experimental formulations have been developed for elimination of antibodies neutralizing the chimeras. This selective approach has been tested in murine experimental model systems of the mentioned autoimmune diseases. Approaches have also been applied to the selective inhibition of pathological human B-lymphocytes by chimeric molecule therapy, which have been successfully tested on human cells from SLE patients, transferred to SCID mice and in a series of in vitro experiments performed with peripheral mononuclear cells from patients with

type 1 diabetes. An experimental formulation for the suppression of autoreactive B and T cells by a monoclonal antibody against annexin in a pristane-induced mouse model of lupus has been developed. This immunotherapy has been successfully tested in vivo to modulate the autoimmune response in a mouse model that spontaneously develops lupus and in a humanized mouse model of lupus.

2. Natural biological molecules with anti-tumor and adjuvant potential

Four out of 22 articles (18%) are dedicated to this problem. A mouse model of colon cancer was developed to test the anti-tumor and anti-proliferative properties of hemocyanins isolated from *Rapana thomasiana* (Rt) and *Helix pomatia* (Hp) and their ability to be used as bio-adjuvants in combination with standard antigens. A strong cytotoxic anti-influenza response has been demonstrated in the immunization of experimental animals with the combination of hemocyanin from Hp and a peptide from the viral hemagglutinin molecule. The possibility of using hemocyanin from Rt or its subunits in various immunization protocols as adjuvants or as protein carriers has been demonstrated.

IV. Main critical remarks and recommendations

I have no critical remarks. The extensive experimental and publication experience presuppose the active participation of Dr Mihaylova in the education of graduates and PhD students in the department and I am sure that she soon will be acting officially as supervisor and teacher sharing her knowledge.

V. Conclusion:

Dr Nikolina Mihaylova is an independent and successful scientist with high achievements in the field of immunology for whom this procedure is not an end in itself, otherwise it would have happened a long time ago. I think a scientist like her is a treasure for the Department of Immunology. My congratulations to the candidate and all her colleagues who helped her in some way to develop such a potential as a scientist.

Based on all the above arguments, I give my positive evaluation of the research activity of Dr Mihaylova. I would like to propose to the esteemed members of the Scientific Jury to make a positive decision and to propose to the Scientific Council at the Institute of Microbiology, BAS Dr Nikolina Mihaylova to be elected for the academic position of "Associate Professor" in the Department of Immunology, scientific specialty "Immunology", professional field of Biological Sciences, field of higher education Natural Sciences, Mathematics and Informatics.

05.07.21

Sofia

Sincerely yours:

Assoc. Prof. Dr. Ta