

STATEMENT

by assoc. prof. Petya Asenova Dimitrova, Laboratory of Experimental Immunotherapy,
Department of Immunology, the Stephan Angeloff Institute of Microbiology – BAS,
A member of the Scientific Jury, according to order № I-39 / 23.04.21, issued by the Director of
the Stephan Angeloff Institute of Microbiology at the Bulgarian Academy of Sciences

Concerning: Statement about the candidate's application for the academic position "Associate Professor", in the professional field 4.3. Biological Sciences (Immunology), announced and published in the State Gazette, issue no. 20 / 09.03.2021, subjected for the needs of the Department of Immunology, The Stephan Angeloff Institute of Microbiology – BAS.

Information about the candidates in the competition

Nikolina Mihaylova Mihaylova is the only candidate in the announced application for the academic position „Associate Professor “. She received a Bachelor's degree in Biology in 2003 and a Master's degree in Cell Biology and Pathology in 2005 from the Biological Faculty at Sofia University "St. Kliment Ohridski". In 2009 she obtained a scientific and educational degree "Doctor" in the scientific specialty 01.06.23 – Immunology. She defended her PhD thesis entitled: "Immunomodulatory activity of novel experimental IgM and IgG preparations" under the supervision of Prof. Tchavdar Vassilev at the Institute of Microbiology. The scientific results of her PhD thesis were included in 2 publications - Clinical and Experimental Immunology in 2006 and International Immunology in 2007. Dr. Nikolina Mihaylova has been working on a permanent researcher position at the Institute of Microbiology - BAS since 2008 and has a work experience of 17 years, 1 month and 29 days. She received the Award of the Stephan Angeloff Foundation for the best work of a young microbiologist in Bulgaria in 2008; the Award of the Bulgarian Academy of Sciences "Ivan Evstratiev Geshov" for a young scientist up to 30 years in the field of biological sciences in 2009 and the Award of the Bulgarian Academy of Sciences "Prof. Marin Drinov" for a young scientist in the field of biological sciences in 2017.

Fulfilment of the requirements to hold the academic position

According to the national requirements, Dr. Nikolina Mihaylova fulfils the minimal criteria for the position, based on the group indicators and points: According to the indicator A she has submitted a Short Book Description of a PhD thesis. According to the indicator B, the candidate has 9 scientific publications, 3 of which are in journals with Q1 rank - a total of 185 points. According to the indicator D, 12 scientific papers and one book chapter are presented, as 3

publications in journals with Q1 rank and the total points of 262. According to the indicator D, Nikolina Mihaylova has 102 citations - 204 points. According to the indicator E, the candidate presents evidence of granted projects in which she participated or has been a principal investigator, with a total activity of 213 points.

According to the Regulations of the Institute of Microbiology-BAS, Dr. Nikolina Mihaylova fulfils the additional criteria as follows: there are 23 articles after her PhD title out (required are 20), there is an IF of 93,672 (the required is 20), H factor 9 (the required is 5) and 102 citations (the required are 100 for the entire scientific career).

Scientific topics

Dr. Nikolina Mihaylova divides her scientific activity into 3 areas: I. Selective targeting of pathological autoreactive cells by protein-engineered antibodies and by monoclonal antibodies in mouse and human models of autoimmunity. II. Natural biological molecules with anti-tumor and adjuvant properties. III. Immunomodulatory activity of immunoglobulin molecules.

Dr. Nikolina Mihaylova, as part of the team of Prof. Tchavdar Vassilev has actively participated in the development of novel therapeutic approaches for systemic lupus (SLE) based on the use of chimeric or monoclonal antibodies with selective mode of action - part I. The principle of their idea for therapy is targeting antigen-specific B lymphocytes (autoreactive, pathological B lymphocytes) and concomitant involvement of inhibitory receptors (FcγRIIb and complement receptor), which suppress abnormally activated pathways in autoreactive B cells. Therapeutic effects of the following chimeric molecules in systemic lupus have been established - a monoclonal rat antibody against FcγRIIb carrying a DNA mimotope; a murine monoclonal IgG antibody bearing the DNA-mimicking peptide DWEYSVWLSN and the CD22-binding STN epitope with free terminal sialic acid; a monoclonal antibody against a human complement 1 receptor inhibitory receptor associated with the DWEYSVWLSN decapeptide, which mimics an antigenic region of DNA.

A similar strategy has been used to target autoreactive cells in type I diabetes, in particular a model of streptolysin-induced autoimmune diabetes, that uses a 2.4G2 monoclonal antibody conjugated to epitope peptides, part of the GAD65 molecule. The administration of the chimeric antibody results in a decrease in the number of anti-GAD65 IgG antibody-secreting plasma cells and an increase in the apoptosis of specific B lymphocytes.

Although this strategy for selective targeting of autoreactive cells in systemic lupus and diabetes is original, it is mostly related to the work of Dr. Mihaylova, as a team member of Prof. Tchavdar Vassilev' and Prof. Andrey Tchorbanov' groups. In my opinion, the most significant articles, in which new ideas and potential of Dr. Mihaylova blossom, are related to a completely new approach - the use of anti-ANX A1 antibody in spontaneous SLE model in MRL / lpr mice and in humanized SLE mouse model. I believe that this should be Dr. Mihaylova's "new research activity", as the role of Annexin A1 is just still unclear. Although there is evidence for the regulation of T cell differentiation, positive and negative selection of autoreactive T cells by

Annexin A1, a new study in Cell 2021 Jun 11; 10 (6): 1472 shows its importance in the isolation of cancer-derived exosomes and the formation of a suppressive complex with PLA2. The attention of scientists in recent years has definitely focused on the role of Annexin A1 in tumors, neuroinflammation and autoimmunity, and in the last year about 120 publications have been published in leading research journals. In Bulgaria, this topic was developed only by Dr. Mihaylova and her collaborators in the articles, which means that this can be a "successful future scientific niche for her." I strongly encourage her to continue research in this direction, looking for new collaborations with international teams.

Additional activities - Participation in scientific projects and scientific forums

Since 2004, Dr. Mihaylova has participated in more than 60 congresses and scientific forums. Dr. Mihaylova took a part in 12 national projects and 2 international projects, which means that she is a wanted partner and expert. Since 2019 he has been the principal investigator of new project. According to my personal observations, Dr. Mihaylova has already established "good practices for project management" dealing with hard practical problems (including unpleasant documentation, maintenance of equipment, maintenance of animal facility), which will allow her to be effective in seeking new funding for her ideas and in their implementation in the future - two absolutely necessary requirements as independent researcher besides her mentors (Prof. Vassilev and Prof. Tchorbanov).

Conclusion

In conclusion, Dr. Nikolina Mihaylova shows skills for independent work. There is 1. a solid basis of already published research and data recognition by citations (indicators exceeded the minimal national and additional requirements of the Institute of Microbiology), 2. She has the potential for new ideas and 3. She has practical skills for implementing the research projects. These 3 factors, in my opinion, define her as a promising scientist, whose career should be definitely supported. Based on the materials presented, I give a completely POSITIVE assessment of the Nikolina Mikhaylova's application for the academic position "Associate Professor".

Sofia 06.07.2021

Signed by:

Assoc. Prof. Petya Dimitrova