OPINION

by assoc. prof. Dr. Tanya Dimova, Institute of Biology and Immunology of Reproduction "Acad. K. Bratanov", BAS, member of the scientific jury

on 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 "Immunology" under the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB) for the needs of the Department "Immunology", Laboratory "Experimental Immunotherapy", Institute of Microbiology "Stefan Angelov" (IMicB), Bulgarian Academy of Sciences (BAS). This opinion is acc. to the order I-170/28.10.2025 of the director of IMicB, BAS and is in line with the requirements of ZRASRB and the Regulations for its implementation, as well as with the Regulations on the terms and procedure for acquiring scientific degrees and academic postions at IMicB and BAS. The competition for the **academic position of "professor"** was announced in the State Gazette (84/10.10.2025) with a single candidate, assoc. Prof. Dr. Anastas Dimitrov Pashov. The documents submitted by the candidate meet the requirements of ZRASRB and the Regulations for its implementation as well as the Regulations on the terms and procedures for acquiring scientific degrees and academic positions at IMicB and BAS.

Brief biographical data

Assoc. prof. Dr. Anastas Pashov graduated from the Medical Academy, Sofia in 1989 with a distinction level of *magna cum laude*. In 1995, he acquired the degree "Doctor" in Immunology at the National Center for Infectious and Parasitic Diseases, Sofia, a diploma for Ph.D. N 23439/20.02.1995 from the Higher Attestation Commission (VAC). Since 2010 was elected as an associate professor at IMicB-BAS by a decision of VAC and holds this academic position to this day. The education and professional development of the candidates are in the field of Immunology and thus fully correspond to the direction and specificity of the announced competition.

Scientific achievements of the candidate

Publication activity

For this competition, assoc. prof. Pashov has presented a list of an enviable number of publications - a total of 51, of which 35 publications in group B (habilitation work) and 16 publications in group G incl. 2 book chapters. All publications are in English. The articles are referred and indexed in the global databases Scopus and WoS, only 4 publications (7.8%) are in non-indexed journals with scientific review. Of the 47 refereed and indexed publications, nearly half are in Q1 (22), 11 are in Q2, 5 in Q3 and 7 in Q4. In 16 publications (31%), the candidate is the first or corresponding author. A significant part of the candidates' publications is co-authored with established Bulgarian, European and American scientists and are the result of collaborative research work.

Participation in scientific forums

For this competition, the candidate also attaches a list of reports and posters (total 20) from participation in 8 scientific congresses and conferences and 2 workshops. Assoc. prof. Pashov has participated in 5 international scientific forums, in 2 national ones with international participation and in 1 national forum. Eighteen of the participations were with reports, which emphasizes the authority and leading role of Dr. Pashov in dissemination of his results among the international and our immunological community.

Citations

I am extremely impressed by the wide resonance of the candidate's publication activity. A list of 1490 citations is presented, and the h-index of Dr Pashov's is 20. These are key indicators of his strong academic impact as a scientist, his prestige and visibility in the immunological field, and the relevance of his research.

Participation in scientific projects

In the period after the election to the academic position of "associate professor", Dr. Pashov participated in a total of five national and two international projects, being the leader of four projects - two with international funding and two funded by the Bulgarian Science Fund. The financial resources attracted by his projects are BGN 744 200.

***Patents*:** During the evaluation period, assoc. prof. Pashov has one registered invention in the Patent Office of the Republic of Bulgaria in co-authorship.

Teaching activity of the candidate

In the period under evaluation, Dr. Pashov has lead courses in the project "Fundamental and applied training of doctoral students, postdoctoral students, specialists and young scientists in interdisciplinary biological fields and innovative biotechnologies" (2014-2015).

Supervision of doctoral students and graduates

Assoc. Prof. Pashov was the scientific supervisor of two successfully defended PhD students and three graduates.

According to the submitted set of documents, the candidate covers and significantly exceeds both the minimum national requirements and these of the Institute of Microbiology and Bulgarian Academy of Sciences for holding the academic position of "professor" in the field of "Natural Sciences, Mathematics and Informatics" and the professional field of Biological Sciences. Of the required total of 600 points according to ZRASRB and 640 points according to the Regulations of the Institute of Microbiology, assoc. prof. Pashov has 4 508 points, i.e. 7 times more.

Scientific and academic contributions of the candidate

A dominant part of Assoc. Prof. Pashov's research is aimed at a critical reassessment of the classical paradigm of high specificity and high affinity as a signature for antibodies. The candidate suggests that antibody specificity is a "Columbus' egg" in immunology, which I strongly hope to be proved. He raises the hypothesis that "monospecificity" is a theoretical abstraction, because mechanisms such as conformational isomerism and the abundance of aromatic residues in the paratope allow antibodies to bind to many different epitopes. In this line of thought, it is more objective to describe the specificity of antibodies as a unique distribution of affinities over all possible structures of the specific antigen landscape. The rethinking of Burnet's classical clonal selection theory and Talmage's idea of antibody polyspecificity as an alternative to the classical model, as well as the new data accumulating on the polyreactivity of antibodies, are a challenge to the classical postulates. The author skillfully advances the idea that these polyreactive antibodies (natural or induced) probably represent an epigenetic addition to the existing repertoire of specificities in each organism and an evolutionarily established function of the immune system. Assoc. Prof. Pashov proves that the polyspecific IgM repertoire is a universal biosensor for changes in the internal environment and that it can be studied by a set of mimotopes that can be rationally scaled to sizes suitable for diagnostic purposes. He designed the first mimotope library for the

analysis of the human IgM repertoire of reactivities recurring in most individuals, also called the public repertoire, by screening of IgM collected from at least 10 000 donors to “diffuse” unique specificities. By considering the entire repertoire of antibodies in our serum, the IgOme, as a reflection of our immune status at any given time, the candidate demonstrates that understanding the dynamics of the igome and the diversity and specificity of serum antibodies as they change, both in response to disease and in the maintenance of homeostasis, can directly impact the ability to design and develop new vaccines, diagnostics and therapeutics. The main contributions of the candidate's work are: 1) Development of tumor vaccines based on carbohydrate mimotopes and formulation of concepts for the greater effectiveness of polyspecific anti-idiotypic epitope vaccines compared to monoclonal-based anti-idiotypic ones as well as quantitative (threshold) tolerance to explain the phenomenon of tumor-associated antigens and 2) Development of a bioinformatic approach for analysis of the repertoire of specificities using gene libraries and/or peptide microarrays in various non-infectious diseases such as tumor (glioblastoma), autoimmune (antiphospholipid syndrome) and neurodegenerative diseases such as Alzheimer's disease and frontotemporal dementia. These studies demonstrate a loss of normally existing reactivities of natural IgM antibodies in patients compared to healthy people, and in autoimmune conditions, increased idiotypic affinity and homology with self-protein antigens. Thus, the IgOme analysis proves to be a valuable tool for studying these phenomena.

The current projects and future plans of the candidate are aimed at improving the developed methods for systematic analysis of antibody specificity repertoires with a focus on the igome image of individual antibodies. He plans an analysis of repertoires of tumor-infiltrating B cells and the study of the correlation of the igome images of these repertoires with the sequences of the B-cell receptor in order to create the methodological basis for linking the igome analysis of specificity with a standard analysis of the variability of the B-cell receptor repertoire. In this regard, the candidate plans to recruit a team for bioinformatics of the obtained data sets. He will also continue his long-standing collaboration with scientists from the Cordelier Center, Paris, on the idiotypic relationship of the antibody repertoire of newborn mice with the maternal repertoire to track possible selection of the emerging neonatal repertoire from the existing maternal repertoire.

Critical remarks and recommendations

I have no critical remarks. I would recommend assoc. prof. Pashov to pass on his rich experience, knowledge and innovative research approaches to more doctoral students in the future.

Conclusion

Assoc. Prof. Dr. Anastas Pashov is an honorable person and colleague. He is one of the outstanding scientists and scientist at heart, who dare to challenge existing dogmas and predict new phenomena based on mathematical models, logical abstractions and fundamental physical principles. He is undoubtedly a prominent scientist and his research receives significant scientific response in the Bulgarian and international immunological community. Assoc. Prof. Pashov meets all the requirements of ZRASRB and the Regulations for its implementation, as well as the Regulations of IMicB and BAS for holding the **academic position of "professor".** All this notes determines my positive assessment and allow me confidently to recommend the election of assoc. prof. Dr. Pashov to the academic position of "professor" in the professional field of Biological Sciences, scientific specialty Immunology.

Sofia, 04.02.2026.

Sincerely yours:

(assoc. prof. Dr. T. Dimova)