OPINION

by Assoc. prof. d-r. Dimitar Borisov Iliev, Institute of Molecular Biology – BAS

regarding competition for the academic position of "Associate Professor"

in professional field 4.3. Biological Sciences, scientific specialty Molecular Biology
for the needs of the Institute of Molecular Biology "Acad. Roumen Tsanev", BAS

General Overview of the Procedure and the Candidate

By Order No. 32-OB/28.01.2025 of the Director of the Institute of Molecular Biology "Acad. Roumen Tsanev" at BAS (IMB-BAS), I was appointed as a member of the academic jury for the competition for the academic position of "Associate Professor" in professional field 4.3. Biological Sciences, scientific specialty Molecular Biology.

At the subsequent meeting of the academic jury on 17.02.2025, I was assigned to prepare an opinion on the procedure.

The competition is announced in the State Gazette, issue 104 of 10.12.2024. and has a single candidate – Dr. Emil Parvanov.

The documents submitted by the candidate meet the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the Law, and the regulations of BAS, as well as the criteria of IMB-BAS for acquiring the academic position "Associate Professor." According to the submitted report, the candidate fully meets and exceeds the minimum national requirements for the position.

Biographical Data

- In 2001, Dr. Parvanov obtained a Master's degree in Molecular Biology with a specialization in Biochemistry from the Faculty of Biology, Sofia University "St. Kliment Ohridski."
- In 2006, he earned a PhD in the specialty "Yeast Genetics" from the Institute of Cell Biology, University of Bern, Switzerland.
- From February 2007 to September 2009, he worked as a postdoctoral researcher at The Jackson Laboratory, USA, and from December 2009 to February 2014 at Masaryk University, Brno, Czech Republic.
- Dr. Parvanov's scientific career continued at The Jackson Laboratory, USA (02.2014–07.2015), the Institute of Molecular Genetics – Czech Academy of Sciences, Prague, Czech Republic (11.2015–08.2021), and the Medical University – Varna (11.2021–06.2024), in the fields of mouse genetics, hybrid sterility genetics in mouse strains, and translational stem cell biology.
- Since June 2024, Dr. Parvanov has been working at the Institute of Molecular Biology "Acad. Roumen Tsanev" – BAS, as a senior assistant in the field of epigenetics.

Publication Activity
The result of the candidate's scientific work includes co-authorship in 32 scientific articles indexed in Scopus/Web of Science, 15 of which were submitted for this competition. Five of the articles are listed under Indicator B – Habilitation Work, and the remaining 10, under Indicator G – outside the habilitation work. Most of the presented articles are published in **Q1** journals, with a **total impact factor of 122.18**, attesting the high quality and significance of the candidate's research.

Particularly impressive is an article published in the journal ***Science*, with an impact factor of 47.73**, in which Dr. Parvanov is the first author, highlighting his significant contribution to the work.

Citations
The candidate has provided citation data from Scopus for the period 2008–2024, showing a total of 1,057 citations. This is a clear indicator of the high quality of Dr. Parvanov's scientific publications.

Participation in Scientific Projects
Dr. Emil Parvanov has led two international projects:

1. **2011–2013:** "Prdm9 – linking histone modifications and DNA recombination" – Masaryk University, Brno, Czech Republic; South Moravian Grant (SoMoPro) (co-funded by the Marie Curie Foundation).

2. **2017–2020:** "The role of Prdm9 alleles in mouse hybrid sterility" – Institute of Molecular Genetics, Prague, Czech Republic; Funded by the Czech Science Foundation (GACR).

Supervision of Doctoral Students
Dr. Parvanov supervised one PhD student who successfully defended their dissertation in 2022.

Scientific and Applied Contributions of the Candidate
The scientific and applied contributions of Dr. Parvanov, as well as his specific involvement, are accurately listed in the submitted documentation. In collaborative publications, the candidate's individual contribution is clearly defined and beyond doubt. The contributions are categorized as follows:

1. **Mapping recombination events along mouse chromosomes.**
   The data show that the regulation of meiotic recombination is a dynamic process influenced by species, sex, and individual variation.
2. **Discovery of trans-acting factors determining the location and activity of individual recombination hotspots during meiosis.**
   It was found that the presence of a gene with a CAST/EiJ allele in the genome can activate or suppress the activity of recombination hotspots. Specifically, the Prdm9 gene in the CAST/EiJ configuration activates studied hotspots on chromosome 1. The

discovery of the high variability of Prdm9 zinc fingers and their role in DNA binding sheds light on the mechanisms of recombination site selection.

3. **Determination of the mechanism of action of Prdm9.**
   Dr. Parvanov's research established that Prdm9 trimethylates not only lysine 4 but also lysine 36 of histone 3. Additionally, it was shown that Prdm9 not only indicates where recombination will initiate but also determines the length of the DNA exchanged during crossover.
4. **Analysis of trends in digital healthcare, patient safety, and personalized medicine.**
   Part of Dr. Parvanov's scientific career is in the field of medicine, in particularl - digital healthcare and patient safety, highlighting the applied scientific nature of this research.

CONCLUSION

After reviewing the materials and scientific works submitted for the competition and based on an analysis of their significance and the scientific contributions they contain, I confirm that the candidate's scientific achievements meet and, in many aspects, significantly exceed the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, its implementing regulations, and the relevant BAS rules for appointment to the academic position of "Associate Professor" in the specified scientific field and specialty.
In view of the above, **I strongly recommend that the academic jury propose the candidate Dr. Emil Parvanov for appointment to the academic position of "Associate Professor"** at the Institute of Molecular Biology "Acad. Roumen Tsanev" – BAS.

Date 25.04.2025

Prepared by:

.....

(Assoc. prof. Dimitar Iliev)