

BRIEF REFEREE REPORT

on conducting a competition for the academic position of "Associate Professor", in the field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences (Biochemistry),

announced in Official State Gazette, issue. 17 / 26.02.2021,

for the needs of the laboratory "Regulation of gene expression" at the Institute of Plant Physiology and Genetics (IPPG), Bulgarian Academy of Science (BAS)

Referee: Prof. Galina Teneva Yahubyan, PhD

Scientific specialty: Molecular biology

Institution: University of Plovdiv "Paisii Hilendarski"

appointed a member of the Scientific Jury by order RD10-02/23.04.2021, IPPG, BAS

One candidate - Chief Assistant Professor Dr. Kiril Mihailov Mishev takes part in the announced competition for the academic position of "Associate Professor" in the specialty "Biochemistry" at IPPG, BAS.

The submitted documents are in accordance with the requirements of the Law on the Academic Staff Development in Republic of Bulgaria, the Regulations for its implementation and the Regulations of for the specific conditions and procedure for acquiring scientific degrees and holding academic positions in IPPG, BAS.

1. Career profile of the candidate

Kiril Mishev has a BSc degree in Molecular Biology (2003, Sofia University "St. Kliment Ohridski"), a MSc degree in Plant Physiology (2004, Sofia University "St. Kliment Ohridski") and a PhD degree in Plant Physiology (2009, IPPG, BAS).

Dr. K. Mishev began his career development in 2008 as a senior assistant at the Laboratory of Gene expression regulation, IPPG, BAS, where he continues to this day. He has completed numerous doctoral and post-doctoral specializations and working visits to leading research centres and laboratories abroad. He was awarded the prize for high scientific achievements of the Rotary Club, Sofia-Sredets (2009).

2. General description of the submitted materials under the competition and compliance with regulatory requirements

Ch. Asst. Prof. Dr. K. Mishev participates in the competition with:

- **1 dissertation** for the acquisition of ONS "Doctor";
- **16 scientific publications** in peer-reviewed and indexed international journals with a **total JCR IF 98.964**, of which:
 - 14 research articles and 2 review articles;
 - **4 articles** are equivalent to **habilitation work**, assigned to the **indicator group B** and bring the candidate **100 points**;
 - **12 articles** are assigned to the **indicator group G** and bring the candidate **274 points**, of which **87 points** are formed by 4 articles in which he is the **first author**;
 - **14 articles** are with quartile **Q1** and **2 articles** with quartile **Q4**;

- **18 projects**, of which:
 - 15 research projects and 3 others,
 - 4 research projects, of which the applicant is the head or coordinator of IFRG, BAS, as 2 of them after acquiring ONS "Doctor" for a total amount of BGN 61,250;
- **285 citations** of 19 scientific publications of the candidate (according to the databases for scientific information Web of Science and Scopus) that form **570 points**;
- **Hirsch citation index** ("h-index") - **8**, according to Scopus.

The metric indicators of the scientific performance of Ch. Asst. Prof. Dr. K. Mishev not only meet, with a **total number of points - 994**, but also significantly exceed the minimum national criteria for awarding the academic position "Associate Professor" and the increased minimum requirements of BAS.

3. Evaluation of the achievements in the research work of the candidate

The scientific works of Ch. Asst. Prof. Dr. K. Mishev are in the fields of plant physiology, biochemistry and proteomics, molecular and cell biology. A distinctive feature of his research is the interdisciplinary approach, implemented with the most modern biotechnological methods - screening of combinatorial chemical libraries (**G7_3, B4_2, B4_1, B4_4**), confocal laser microscopy (**B4_1, B4_4**).

These works contain **original scientific contributions**, enriching the scientific knowledge in the field with significant new facts concerning the molecular mechanisms regulating essential processes in the plant organism:

- intracellular membrane traffic (**B4_1, B4_2, G7_3, B4_4 and G7_7**) - new protein factors and interactions have been discovered in *Arabidopsis* for redirection of proteins internalized by endocytosis back to the plasma membrane or to the lytic vacuole;
- hormonal signalization (**G7_8, B4_3, G7_5**) - the role and interactions of the brassinosteroid receptor BRI1, U-box ubiquitin ligases PUB12 and PUB13 and BIN2 kinase in the brassinosteroid signal pathway were clarified with the help of fluorescent marker lines of *Arabidopsis*;
- stress response (**G7_9, G7_10, G7_11**) - differences in the expression of genes encoding structural proteins of photosystems and RuBISCO (psaB, psaA and rbcL), markers of leaf aging (SAG12) and enzymes of photosystem repair (FtsH5 and Deg1) were observed in dark stress of cotyledons, true leaves and whole plants of *Arabidopsis thaliana* and *Cucurbita pepo*, as the differential expression of the studied genes is related to the transcriptional activity of plastids and nucleus under dark stress conditions;
- organization of ribosomal DNA (rDNA) in *Hordeum* (**G7_2, G7_4**) - hypomethylated CCGG regions were found in rDNA repeats on *H. vulgare* by applying restriction analysis with methyl-sensitive endonucleases and comparison with a deletion mutant, and associated with epigenetic control of the activity of the nucleolar organizer; The length of the R128 repeat region of the intergenic spacer in the genome of *H. bulbosum* was determined, which is thought to have a regulatory role in the transcription of rRNA genes and a relationship to nucleolar dominance.

Valuable **scientific contributions of applied significance** are found in the works of the candidate. Screening studies of combinatorial chemical libraries conducted by the candidate et collaborators have led to the identification of new low-molecular-weight inhibitors (Secdin

and ES4, **G7_3** and **B4_2** respectively) of endomembrane traffic and endocytosis (ES9 and ES9-17, **B4_4**) that have potential for biological activity, not only in the model species *Arabidopsis*, but also in other eukaryotic systems (including human cells).

Evidence of the high level of research activity of Ch. Asst. Prof. Dr. K. Mishev, as well as of the impact of his achievements in the world scientific community, are the prestigious indexed and referenced international journals in which he publishes, namely: Nature Communications IF 12.948; Nature Chemical Biology IF 12.124; Proc Natl Acad Sci U. S. A. IF 9,580; Plant Cell IF 8,631; Current Opinion in Plant Biology IF 7,848; Chemistry & Biology IF 6.586; Plant Physiology IF 6.456 et al., and have been cited.

4. Teaching activity

Ch. Asst. Prof. Dr. K. Mishev has 8 years of teaching experiences. He is a participant in the project of the Ministry of Education and Science "Student Internships" funded by the Operational Program NOIR in the period 2013 - 2021 being a mentor to a total of 8 students from the Faculty of Biology at Sofia University "St. Kliment Ohridski ". He was co-supervisor of a thesis of a student from HO GENT, Ghent, Belgium (2015).

5. Personal contribution

All publications of Ch. Asst. Prof. Dr. K. Mishev are co-authored and the author has very precisely reflected in the presented materials his contribution to the relevant scientific work or scientific activity. On this basis, I can conclude that the applicant has a significant share in their planning, implementation, funding and public presentation.

CONCLUSION

The scientific production of Ch. Asst. Prof. Dr. K. Mishev contains significant scientific and science-applied contributions, visible for the international scientific community. Based on the submitted competition materials, it is evident that he has grown as a researcher with in-depth knowledge and methodological skills in a number of areas of plant biology, as a creative and correct partner in joint research projects.

The candidate Ch. Asst. Prof. Dr. Kiril Mishev meets the mandatory and specific conditions and scientific-metric criteria for the academic position of "Associate Professor" according to the requirements of the Law on the Academic Staff Development in Republic of Bulgaria, the Regulations for its implementation and the Regulations of IPPG, BAS. I confidently give my **positive assessment** of the academic performance of Ch. Assistant Professor Dr. K. Mishev in this competition. I recommend to the Scientific Jury to prepare a report-proposal to the Scientific Council of IPPG, BAS, **for election of Ch. Asst. Prof. Dr. Kiril Mihailov Mishev of the academic position "Associate Professor"** at IPPG, BAS, in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.3. Biological sciences (scientific specialty Biochemistry).

15.06.2021

/Prof. Galina Yahubyan, PhD/