REPORT

by Prof. Stanislav Rangelov, DSc

Member of the Academic Jury set to render a decision on the competition for filling the academic position of ***Associate Professor*** in the Professional Field 4.3 *Biological Sciences*, scientific specialty *Biochemistry*, for the needs of Laboratory *Regulation of Gene Expression*, Institute of Plant Physiology and Genetics – BAS (IFRG), announced in Official State Gazette, issue. 17 17/26.02.2021

This report was prepared in response to Order № RD-10-02/23.04.2021 of the Director of IFRG. The Report is in compliance with the Development of Academic Staff in the Republic of Bulgaria Act (DASRB), the Rules for the Application of the DASRB and the Rules set by the IFRG for applying the Act aforementioned.

General information about the candidate

Assist. Prof. Dr. Kiril Mishev is the only candidate in the competition for the academic position of *Associate Professor* in the Professional Field 4.3. Biological Sciences, announced in ДВ бр. 17/26.02.2021. All documents submitted by the candidate have been prepared in accordance with the requirements of the Development of Academic Staff in the Republic of Bulgaria Act (DASRB) for the acquisition of the academic position of *Associate Professor* and the Rules of the IFRG for its Implementation. The candidate obtained a PhD degree in *Plant Physiology* in 2010 after successfully defending a PhD thesis on the *Functional State of the Photosynthetic Apparatus and Gene Expression in Chloroplasts in Dark-Induced and Natural Aging*. Since 2008 Dr. Mishev has held the position of *assist. prof.* at IFRG-BAS and conducts research in the field of plant physiology, cell biology and biochemistry.

Assessment of the scientific and research accomplishments

The total number of publications of Dr. Kiril Mishev is 24. In the competition he participates with 16 publications published in the period 2004 – 2021: 14 of them are of the type *research article*, and 2 – *review paper*. Most of the publications (14) fall into quartile Q1; 2 - into quartile Q4. The total SJR impact factor of the publications for the competition is 98.964. The publications in *Nature Chemical Biology* и *Nature*

Communications (IF > 12), *Proc. Natl. Acad. Sci. USA*, *Plant Cell* (IF > 8.6) are noteworthy. All publications are co-authored, and in 4 of them Kiril Mishev is the first author.

The materials presented in the competition show that the results of the research activity of Dr. Kiril Mishev exceed the minimal national requirements, as well as the requirements set in the relevant Rules of BAS and IFRG-BAS for holding the academic position of *associate professor*. This is evident from the points for each of the indicators calculated in accordance with the DASRB and the Rules for its implementation. Four scientific publications in the above-mentioned journals (Nature Chemical Biology, Nature Communications, Proc. Natl. Acad. Sci. USA, Plant Cell) are presented in the group of indicators *B*. All of them fall into quartile Q1, with which the minimum required 100 points are fulfilled. The evaluation of the group of indicators *Г* is based on 12 publications with a total number of points of 274, whereas the minimum required is 220. According to Annex 1 of the Rules on the specific conditions and procedures for acquiring scientific degrees and for holding academic positions in IFRG-BAS, at least half of the points from the group *Г* indicators must be formed on the basis of scientific publications in which the candidate is indicated as an author for correspondence and/or a first author; the number of points could be further reduced to 70 if the applicant is the principal investigator or coordinator of one or more projects funded by NSF, European programs, etc. I consider that the minimal requirements according to Annex 1 are exceeded, as the total number of points from publications in which Kiril Mishev is the first author is 87 (3 Q1 × 25 points + 1 Q4 × 12 points), and he is/has been a principal investigator/coordinator of research projects for which financial resources have been received by IFRG-BAS. Regarding the indicators of group *Д*, a list of 285 citations of the publications submitted in the competition is attached. This means 570 points, which exceeds the required minimal number of 100 points more than 5 times. The Hirsch index, according to Scopus and Web of Science, without selfcitations of the candidate is 8, which is also compatible with the requirement in Annex 1 of the Rules of IFRG-BAS.

Analysis and evaluation of the applicant's scientific contributions

My impression from the presented publications in the competition is for a high level scientific production. The contributions of Dr. Kiril Mishev are undoubted; they are of a fundamental nature in several directions:

- *Studies of the molecular mechanisms of regulation of intracellular membrane traffic.* Growth inhibitors of intracellular membrane trafficking have been identified and their mechanisms of action have been established. In one of the review articles a comparative analysis of the routes of intracellular vesicular traffic in different eukaryotic systems has been made;
- *Studies of the mechanisms of hormonal regulation in plants*. New aspects of the regulation of auxin biosynthesis and polar auxin transport have been identified. The importance of receptor-dependent endocytosis for the signaling activity of the

brassinosteroid receptor BRI1 has been elucidated and the role of ubiquitin ligases in the brassinosteroid signaling pathway has been established. The BIN2 kinase of the brassinosteroid signaling pathway was investigated using the induced protein aggregation approach. The second review publication summarizes information on the available low molecular weight biologically active substances that can be used to study brassinosteroid activity.

- *Studies of structural and functional aspects of the reaction of the photosynthetic apparatus under stressful environmental conditions.* Differences in the mechanisms of photoprotection have been established depending on the method of application of dark stress. Sensitivity of plastid RNA polymerases to dark stress has been found. Changes in the aging processes of normally illuminated leaf organs, caused by darkening of adjacent leaves, have been established. New aspects of the mechanism of biological action of the amphiphilic peptide melittin from bee venom have been discovered.
- *Studies of the structural and functional organization of ribosomal DNA in barley (Hordeum).* Unmethylated CCGG regions were localized in a small fraction of the rDNA repeats of common barley (*Hordeum vulgare*) and the nucleotide sequence and structural elements in the 25S-18S rDNA region of the genomic DNA of *Hordeum bulbosum* were determined.

Plagiarism was not detected in the presented scientific papers.

Other contributions and achievements

Undoubtedly, Dr. Kiril Mishev is a young and already well-established specialist in the field of plant physiology, cell biology and biochemistry. To the contributions identified above can be added others, which often remain underestimated and are not even noted in the preparation of evaluation reports. These are his numerous participations in scientific forums, including oral presentations at international forums, his participation in research projects, in some of which he is the principal investigator or coordinator of a team (see above), and his teaching and training activities. Dr. Kiril Mishev has frequently been invited to review and evaluate articles and projects, as well as to participate in academic juries in procedures for scientific degrees and academic positions. Among them, the reports for the PhD theses at the University of Ghent, Belgium (3) and the University of Castilla-La Mancha, Spain (1) should be mentioned. Last but not least, the two, obviously successful, long-term post-doc specializations at the Flemish Institute of Biotechnology in Ghent, Belgium, where Dr. Mishev has mastered modern approaches, expanded and deepened his knowledge and gained experience in different research environments have contributed and are contributing to his successful development.

Conclusion

The scientific activity and research metric indicators of Dr. Kiril Mishev exceed the requirements for holding the academic position of *associate professor*, defined in the DASRB, as well as those specified in the Rules of BAS and IFRG-BAS. Based on the materials presented in the competition, as well as the above analyses and evaluations, I give a positive assessment and recommend the Scientific Council of IFRG-BAS to support the election of Dr. Kiril Mihailov Mishev for filling the academic position of *Associate Professor* at the IFRG-BAS in the professional field 4.3 Biological Sciences.

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