R E V I E W

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Re: Competition for an Associate Professor position at the Institute of Organic Chemistry with Centre of Phytochemistry, BAS in professional field 4.2 Chemical Sciences, scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Physiologically Active Substances" for the needs of Laboratory "Chemistry and Biophysics of Proteins and Enzymes"

There is only one candidate applying for the Associate Professor position, announced in the State Gazette 43/31.05.2019: Head Assistant Professor Dr. Miroslav Angelov Rangelov. For the competition the candidate has provided a full set of documents in accordance with the Regulations for the implementation of the Law for development of the academic community in Republic of Bulgaria.

Dr. Rangelov is a graduate from the Faculty of Chemistry, Sofia University. He obtained his M.Sc. degree in 1997 in the field of Organic and analytical chemistry. In 2008 he, under the supervision of Prof. D. Petkov, successfully defended a Ph.D. thesis at the Institute of Organic Chemistry with a Centre of Phytochemistry, BAS entitled "Participation of the vicinal hydroxyl group in biosynthesis of peptide bond in ribosome". He started his scientific carrier in 2002 as a research chemist at the same institute where he was then consecutively promoted to Research Associate III degree (2005), Research Associate II degree (2008) and Head Assistant Professor (2011).

For the competition, the applicant has presented 17 scientific papers, 5 of which are equated to habilitation thesis (set of metrics "V") whereas the rest 12 papers are unified under the set of metrics "G". Sixteen of the papers are published in scientific refereed journals, while one publication is a book chapter published by Elsevier. Two of the presented papers (No 1 from the first group and No 6 from the second group) have been printed before obtaining the doctoral degree, but are not included in the Ph.D. thesis. Note that majority of the papers are printed in top journals in the fields of chemistry/biochemistry and theoretical chemistry (quartiles Q1 and Q2). There are 54 citations in the literature on Dr. Rangelov's publications. Results from his research have been reported in the form of talks or posters at scientific conferences (17 and 29 events, respectively). The candidate has participated in 6 international

research projects (being the head of the contract for one of them) and 17 national projects (also managing one of them).

The main scientific contributions of Dr. Rangelov are in the field of theoretical modeling of biological processes with the focus placed mainly on the mechanism of protein synthesis in the ribosome. He developed and applied new approaches/algorithms for theoretical investigation of systems, characterized by great conformational freedom. Also, a new methodology has been developed for analyzing the catalytic potential of a proton-donating or proton-accepting group depending on its location in the active center. Offered is also a new heuristic algorithm for adding counterions in nucleic acids, which automatically optimizes their type (mono- or divalent cations) and position depending on the spacial characteristics of the phosphate group from the nucleic acid skeleton. The algorithms and methodologies, developed by Dr. Rangelov, have been applied in modeling, at atomic level, of the mechanism of protein synthesis inside ribosome and shed light on various aspects of this process: Investigated are the ribosomal catalytic activity via aminolysis of diols, migration of acyl group in the aminoacelated tRNA, and the role of the hydrogen bond network in the active center.

Theoretical approaches, apart from modeling the processes in the ribosome, have been successfully employed by the candidate in elucidating the mechanisms of therapeutic action of a number of biologicaly active substances such as VV-Hemorphin-5, series of morpholinedione derivatives and single-chain antibodies.

Conclusion

Scientific publications presented by the applicant fall into the scope of the announced competition and represent original scientific investigations with significant contribution to the field of bioorganic chemistry. They are innovative. The candidate is a proven scientist in his scientific domain distinguished by creative thinking, maturity in selecting appropriate targets for conducting research, and originality in applying a large spectrum of theoretical approaches for characterizing biological systems and reaction processes. The results obtained by him provide a basis for future investigations in the field of theoretical modeling of systems of interest to biology, medicine and pharmacy. In conclusion, as a result of the foregoing, I believe that with his scientific activities and achievements Dr. Miroslav Rangelov fully complies with all the requirements of the Law for the occupation of the academic position "Associate Professor".

In connection with the above, I propose Head Assistant Professor Dr. Miroslav Angelov Rangelov to be elected Associate Professor in the professional field 4.2 Chemical Sciences, scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Physiologically Active Substances" for the needs of the Laboratory “Chemistry and Biophysics of Proteins and Enzymes” at the Institute of Organic Chemistry with Centre of Phytochemistry, BAS.

02.09.2019

Reviewer:

(Prof. Todor Dudev)