

## STATEMENT

from Prof. Dr. Irina Bogdanova Karadjova,

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on the materials submitted for participation in a competition for the academic position of 'professor', in the field of higher education 4. "Natural Sciences, Mathematics and Informatics", Professional field 4.2. "Chemical Sciences" (Analytical Chemistry), announced in SG, issue. 57 of 26.06.2020 for the needs of the Faculty of Chemistry and Pharmacy at Sofia University "St. Kliment Ohridski ".

Assoc. Prof. Dr. Ivayla Nedyalkova Pancheva-Kadreva from the Department of Analytical Chemistry at the Faculty of Chemistry and Pharmacy at Sofia University is the only candidate in the contest for 'Associate Professor'. The materials presented by Assoc. Prof. Dr. Ivayla Pancheva-Kadreva are in compliance with the requirements of the Law for the Development of the Academic Staff in Republic of Bulgaria and the relevant regulations for its implementation. In addition the documents presented meet the criteria of Regulation for the Terms and Conditions for Acquiring Scientific Degrees and Occupying Academic Positions at Sofia University "St. Kl. Ohridski" and the Recommended Criteria for Acquiring Scientific Degrees and Occupying Academic Positions at Sofia University "St. Kl. Ohridski" for Professional field 4.2 "Chemical Sciences".

For the contest, Assoc. Prof. Pancheva-Kadreva has presented 19 publications in scientific journals and 3 publications in proceedings of scientific conferences. The presented publications have not been used in other competitions for academic positions and degrees. The main part of the publications are in journals ranked in quartiles Q2 and Q3, respectively 6 and 7; 2 are in Q1 and 4 in Q4. A habilitation work on "The diversity in the properties of the natural antibiotic Monensin" has been also provided. The habilitation work, written on 19 pages, includes 6 of the publications submitted for participation in the contest.

The scientific activity of Assoc. Prof. Pancheva-Kadreva is in the field of bioinorganic and bioanalytical chemistry. The research interests of the candidate are mainly focused on the coordination chemistry of biologically active ionophore compounds, forming complexes with metal ions of first, second and third degree of oxidation. Systematic studies have been conducted on the possibilities to modulate the bioactive properties of the ligands - salinomycin sodium and monensinic acid (known natural antibiotics used as veterinary drugs) via complex formation with suitable metal ion. The defined goals have been consistently achieved - the parameters for synthesis of metal complexes have been optimized; their structure has been elucidated by modern methods (ESI-MS, FAB-MS, IR, EPR, SRCD), their biological activity has been proven by in vitro and in vivo experiments. The main idea for structural characterization of the complexes is to obtain information about coordination of the ligand with metals in different degrees of oxidation and thus to evaluate the hypothesis for the selectivity of the ligand toward a certain type of complexing agents. However, the essential

purpose is to find the relationship between the type of the metal ion complexing agent and the structure of the formed complexes with their biological activity. The significant volume of experimental data results in serious conclusions about the impact of the complexing agent on the activity of the complex and on the changes in the bioactivity of the ligand itself. It has been unequivocally proven that the synthesized metal complexes (Ca, Mg, Co, Mn, Ni, Zn, La (III) and Nd (III)) are more effective than the uncoordinated ligand monensin in terms of proliferation and viability of various cellular lines. Higher bacteriostatic activity of monensin complexes with double-charged ions of Ca, Mg, Co, Mn, Ni and Zn against different bacterial strains has been demonstrated. The presented habilitation work discusses in detail this area of research and achievements of Assoc. Prof. Ivayla Pancheva-Kadreva.

Conversely, a study of metal complexes of acetylcholinesterase reactivators has shown that the new complex species have significantly lower activity than the uncoordinated ligand, explained by the higher stability of the complexes in solution.

In the field of bioanalytical chemistry, research is mainly in the field of toxicology and criminology. A number of results important for laboratory practice have been obtained.

Assoc. Prof. Ivayla Pancheva-Kadreva is the first author and leading author in 12 of the 22 scientific publications submitted for the contest, the impact factor of the journals in which they are published is in the range from 0.242 (Bulg. Chem. Comm.) to 3.067 (RSC Advances). There were 29 citations on publications submitted for participation in the contest, according to the candidate reference. It should be noted that 8 of the 22 publications presented are from the last 2 years, the total number of citations on scientific publications of the candidate is 350.

I consider as a positive aspect the interdisciplinary nature of the research carried out by teams with diverse scientific interests. The leading participation of Assoc. Prof. Ivayla Pancheva-Kadreva in defining the goals of the research, the interpretation of the obtained results and the preparation of the scientific publications is undoubted.

The candidate demonstrate good project management experience. She has participated in 8 national and 2 international research projects in the period 2012-2020. The candidate is the leader of 3 national projects - two of them are research and one is a project under the Operating Program "Science and Education for Intelligent Development" (2017), related to education and lifelong learning of students, PhD students and young scientists.

In addition, she is an active participant in national and international conferences, an active organizer of international conferences and compiler of a collection of abstracts "Chemistry Today for Tomorrow".

Assoc. Prof. Dr. Pancheva is highly qualified researcher with a number of research visits in leading scientific teams, participant in international cooperation and projects with Aarhus University, Denmark, member of the editorial board of The Scientific World Journal (Inorganic Chemistry).

Assoc. Prof. Pancheva-Kadreva is a lecturer in Analytical Chemistry I and II for the specialty Pharmacy and Analytical Chemistry for the specialties "Biology and Chemistry" and "Biology".

In the period 2012-2020, under her supervision, 6 diploma theses and 2 PhD thesis were defended. Currently, the candidate is the supervisor of doctoral student Radoslava Stamboliyska (part-time study).

## **CONCLUSION**

Assoc. Prof. Ivayla Pancheva-Kadreva is an knowledgeable scientist and lecturer with very good prospect to lead and conduct original research. The scientific contributions, published scientific papers, the participation in scientific projects as well as my personal impressions give me a reason to have a positive assessment and to convincingly recommend to the Scientific Council of the Faculty of Chemistry and Pharmacy of Sofia University "St. Kliment Ohridski" to vote positively for awarding of the academic title "Professor" to Assoc. Prof. Ivayla Pancheva-Kadreva in professional field 4.2. "Chemical Sciences" (Analytical Chemistry) .