OPINION

on the competition for the academic position „Professor“ in the field of higher education 4. “Natural Sciences, Mathematics and Informatics”, professional field 4.2 “Chemical Sciences” („Analytical Chemistry“) for the needs of the Faculty of Chemistry and Pharmacy at Sofia University "St. Kliment Ohridski”, announced in the “State Gazette”, issue 103 / 12.12.2023, p. 117-118.

by Associate Professor Dr. Ivanka Grigorova Dakova,
Faculty of Chemistry and Pharmacy at Sofia University „St. Kliment Ohridski”,
a member of the Scientific Jury, appointed by order № RD-38-12/10.01.2024 of the Rector of Sofia University "St. Kliment Ohridski”

The only applicant in the competition is Assoc. Prof. Dr. Galina Gencheva - Kissovsky from the Faculty of Chemistry and Pharmacy at Sofia University “St. Kliment Ohridski”, Department Analytical Chemistry, Laboratory of Molecular Spectroscopy for Structural Analysis. The materials presented by Assoc. Prof. Dr. Galina Gencheva - Kissovsky 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”.

Career development of the candidate. Galina Gencheva - Kissovsky has graduated with Master’s degree in Chemistry (Inorganic and Analytical Chemistry), Sofia University “St Kliment Ohridski“ in 1986. In 1993, she successfully defended her doctoral thesis entitled „Complexation of the bioligand creatinine with nickel, palladium and platinum in aqueous and organic media“ and received the scientific degree "Doctor of Philosophy". In 1992, she was appointed as an Assistant Professor at the Faculty of Chemistry at the Sofia University “St. Kl. Ohridski", in 1997 as the Head Assistant Professor, and from 2004 until now she is an Associate Professor at the Faculty of Chemistry and Pharmacy (FCP). Assoc. Prof. Dr. Galina Gencheva - Kissovsky is the head of the Laboratory of Molecular Spectroscopy for Structural Analysis at the FCP. In the period 1997 - 2016, she has completed several short-term specializations abroad (University of Saarland, (Saarbrücken, Germany) and Institute of General and Inorganic Chemistry at the University of Münster (Germany)). Assoc. Prof. Dr. Gencheva – Kissovsky is a member of the Bulgarian crystallographic society. She is a Guest Editor of the scientific journals “Pharmaceutics” (Special Issue “Research on the Design of New Metal-Based Antitumor Drugs”) and “Bulgarian Chemical Communications” (Vol. 49, Special Issue A, Proceedings of the VIth National Crystallographic Symposium, Sofia, October 5-7, 2016). She is currently Vice-Dean of FCP.

Scientific activity of the candidate. Assoc. Prof. Dr. Gencheva - Kissovsky is a co-author of 52 scientific publications, 40 of which are referenced in Scopus and Web of Science, and 12 in non-refereed journals. According to data submitted by the candidate, the scientific publications have 286 citations (exclude self-citations, Scopus) and her h-index is 8 (exclude self citations of all authors, Scopus). She participates in the competition for a professor position with 21 publications (group of indicators D: Q1 – 6, Q2 – 3, Q3 – 2, Q4 – 6, SJR – 1; group of indicators G – 3 publications) and one patent. A careful review of the submitted materials gives me reason to believe that publications № 6, 14 and 15 (published in journals in quartile Q4) should be evaluated with 12 points (not 10), and publication № 12 to be transferred to group of indicators G. Despite these corrections, the points under group of indicators D and G exceed the minimum national requirements of the Law for the Development of the Academic Staff in Republic of Bulgaria as well as the additional requirements specified in FCP recommendations for occupying academic position "Professor". The candidate is the lead author (first author and/or corresponding author) in 15 articles. The citations of the articles submitted for the competition are 68 (Scopus, exclude self-citations).

The presented habilitation thesis, entitled “Instrumental methods for molecular structure determination - application in modeling of non-classical antitumor drugs” is based on 4 publications (Q1) in which the candidate is a leading researcher. The habilitation thesis presents and discusses the possibilities and areas of application of a group of instrumental methods for the control of preparation processes, for the structural characterization and study of the physicochemical properties of newly obtained compounds. The instrumental methods used are from the groups of molecular spectroscopy, magnetic measurements and diffraction methods and operate over a wide range of the electromagnetic spectrum. To demonstrate the advantages of the designed novel structures, the results of *in vitro* experiments are presented. The presented habilitation thesis is in a clearly defined area and with the candidate's own achievements.

Scientific contributions. The main areas of scientific interests and research of Associate Professor Gencheva - Kissovsky related to the synthesis of new complex compounds, their structural characterization and the study of the possibilities of their application as antitumor drugs. A theoretical approach was developed to evaluate the complexing ability of organic ligands. A relation between the spectral characteristics of the ligands and their complexation properties is derived. The scientific contributions can be summarized in the following main areas::

1. Application of the instrumental methods for the study of complex-forming equilibria and analysis in determining the molecular structure of:

a) newly synthesized metal complexes of Au(II), Pt(III) and Pd(III) with hematoporphyrin IX, of Pt(IV) with the ligand 1,3,5-triamino-1,3,5-trideoxy-cis-inositol (taci, all-cis-2,4,6-triaminocyclohexane-1,3,5-triol);

b) targeted selected ligands such as tertiary phosphine oxides functionalized with primary and tertiary amino group and investigation of their coordination ability.

2. Application of the methods of vibrational spectroscopy and X-ray diffraction in studying the physicochemical properties of new materials and natural products, and determination of crystal structure.

3. Development of a cyclic method for the preparation of K_2PtCl_4 by reduction under mild conditions of solutions of K_2PtCl_6 with $K_2C_2O_4$, for which a patent has been issued (Hellenic Patent No 1007317 (2011), Reg. No 20100100327 (2010); Int. Cl: C01G 55/00).

The main results of the scientific research of Assoc. Prof. Dr. Gencheva - Kissovsky were also promoted through oral and poster presentations at a total of 10 scientific conferences.

Teaching and project activity. Assoc. Prof. Dr. Galina Gencheva - Kissovsky is an experienced and respected teacher in the field of the analytical chemistry and instrumental methods. She conducted lectures of courses such as "Analytical chemistry and instrumental methods - I", „Instrumental methods - II", „ Methods of vibrational spectroscopy", „ Complex Compounds in Analytical Chemistry", „ Analytical Chemistry – I and II" (2006 – 2009) in Bachelor's degree , "Modern applications of molecular spectroscopy in chemical analysis" (MSc program: "Intelligent analytics"), "Modern methods of molecular spectroscopy" and "Electrochemical methods of analysis" (MSc program: "Modern spectral and chromatographic methods of analysis". She has supervised 9 successfully defended diploma students (BSc and MSc) as well as 2 PhD students. She was a scientific consultant to one PhD student. Assoc. Dr. Prof. Gencheva - Kissovsky is co-author of a textbook (for 12th grade of high school, approved by the Ministry of Education and Science) and a textbook of analytical chemistry problems for students.

The project activity of Assoc. Dr. Prof. Gencheva - Kissovsky includes 6 national projects and 4 projects at the University of Sofia. The candidate is the leader of 2 successfully completed national projects and 4 projects at Sofia University.

Conclusion:

The presented overall scientific research, project and teaching activities and the fulfilled quantitative indicators clearly show that Assoc. Prof. Dr. Galina Gencheva - Kissovsky is a well-established and independent scientist, possesses a high professional level in the scientific specialty "Analytical Chemistry". Based on the above, I am convinced of my positive assessment and suggest Associate Professor Dr. Galina Gencheva - Kissovsky to be elected to the academic position of "Professor" in the professional field 4.2 Chemical Sciences (Analytical Chemistry).

Sofia Writing the opinion: .....

18.04.2024 Assoc. Prof. Dr. Ivanka Dakova