

## OPINION

by **Maria Yordanova Angelova-Romova,**  
**Associate Professor at Plovdiv University "Paisii Hilendarski"**

of the materials submitted for participation in the competition to occupy the academic position of "Associate Professor" at University of Plovdiv "Paisii Hilendarski" by: field of higher education 4. Natural sciences, mathematics and informatics professional direction 4.2. Chemical Sciences (Organic chemistry, Bioorganic chemistry)

In the competition for academic position of "Associate Professor", announced in the State Gazette, no. 98 of 19.11.2024 and on the website of the University of Plovdiv "Paisii Hilendarski" for the needs of the Department of Organic chemistry, Faculty of Chemistry, as the only candidate participates Assist. Prof. Dr. Mina Mihaylova Todorova from the Department of Organic Chemistry at the Faculty of Chemistry of University of Plovdiv "Paisii Hilendarski".

### **1. General presentation of the procedure and the candidate**

By order No. RD-22-81/17.01.2025 of the Rector of the University of Plovdiv "Paisii Hilendarski" (PU) I have been appointed as a member of the scientific jury of a competition for the academic position of "**Associate Professor**" at the PU in the field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.2 Chemical sciences (Organic chemical, Bioorganic chemistry), **announced for the needs** of the Department of the Organic chemistry, Faculty of Chemistry of the PU.

Only **one candidate** submitted documents for participation in the announced competition, namely Assist. Prof. Dr. Mina Mihaylova Todorova from the Department of Organic Chemistry at the Faculty of Chemistry. The presented set of materials on an electronic media is in accordance with the Rules for the Development of the Academic Staff of the PU, and includes all the necessary documents.

The candidate, Assist. Prof. Dr. Mina Todorova, has submitted a total of 33 scientific papers and 2 textbooks for laboratory work. A total of **24** scientific papers are accepted for review (all of them in publications, referenced and indexed in the Scopus and/or Web of Science databases): **10** according to indicator *B.4.* and **14** according to *G.7.*, which are outside the dissertation and are counted in the final grade, and **2** textbooks for laboratory work. Two scientific works related to the dissertation and 7 research papers from the competition for the academic position "Assist. Prof." are not reviewed being outside of the competition's issues.

The papers presented for consideration are in good formatted form and very well organized. All applied scientific works are of a high level and have indisputable practical-applied significance.

### **2. Brief biographical data of the applicant**

The candidate in the competition, Assist. Prof. Dr. Mina Todorova, obtained her Bachelor's degree in 2003 and the Master's degree in 2005 in scientific specialty "Medicinal Chemistry" at the University of Plovdiv "Paisii Hilendarski." In 2015, she defended her

dissertation for a Ph.D. degree at the Faculty of Chemistry of Plovdiv University. In 2007, she was appointed as an Assistant, and later as an Assist. Prof. in the Department of Organic Chemistry at the University of Food Technologies – Plovdiv, Technological Faculty. Since 2021, she has been an Assist. Prof in the Department of Organic Chemistry at the Faculty of Chemistry of University of Plovdiv "P. Hilendarski," where she is actively involved in research and teaching activities. She is highly responsible, ambitious, and respected by both colleagues and students.

### 3. General description of the applicant's activity

*The educational and pedagogical activities* of Assist. Prof. Dr. Todorova include lectures, seminars, and laboratory exercises with students in the Bachelor's and Master's Degree Programs. She participated in the development of two new curricula. She is the co-author of two textbooks for Bachelor's students from the Technological and Economic faculties of the University of Food Technologies – Plovdiv.

Her average workload over the years has significantly exceeded the standard of 360 hours of teaching. Her successful work as a teacher is also supported by the six graduate students to whom she was the research supervisor.

The high *evaluation of the candidate's scientific and scientific-applied work* can be supported by the presented 24 articles, all of them in publications, referenced and indexed in the *Scopus and/or Web of Science* databases. The distribution by quartiles is as follows – Q1 – 11 pcs.; Q2 – 2 pcs.; Q3 – 6 pcs., Q4 – 4 pcs., and without Q – 1 pcs. A total of 152 citations were noticed on the publications submitted for participation in the competition (in the Scopus database). The presented scientific works are accessible to a wide audience, thanks to which Assist. Prof. Dr. Todorova receives high recognition from a number of researchers abroad. The applicant has actively participated in numerous national and international scientific forums, with a total of 15 participations over the past two years. Since 2013, Assist. Prof. Dr. Mina Todorova has contributed to 9 projects, including 6 university projects and 3 projects funded by the Scientific Research Fund of the Ministry of Education and Science. In 2024, she reviewed 6 articles in scientific papers.

The main *contributions* in the considered scientific publications can be presented as:

➤ *scientific contributions* – for the first time, the design of dyes as NLO-phores and the optimization of synthetic approaches for their preparation were presented. The study examined the introduction of various structural elements (donor or acceptor groups) to influence charge transfer within the system and enhance the second-order nonlinear optical response.

For the first time, 80 samples of propolis from all 28 regions of Bulgaria have been studied. A correlation has been established between the region from which the propolis is isolated and its physicochemical properties, content of polyphenols and flavonoids, and consequently, its antioxidant and antimicrobial activity.

➤ *scientific and applied contributions* – six new styrylquinoline dyes were synthesized, and single-crystal X-ray diffraction was performed on three of them. Thin films of one of the researched dyes were successfully deposited using the PLD technique. The chemical composition and surface of the deposited layers were studied. The reversible electrochemical reactions (oxidation/reduction) of three dyes were evaluated, and the influence of the nature of the donor moieties was established. A rapid quantitative approach was adapted to assess the

inhibition of albumin denaturation, an indicator for determining *in vitro* anti-aging activity. This included the preservation of a valid method using *ex vivo* evaluation, *in silico* calculations, and molecular docking. A rapid, completely green and ecological method for the synthesis of silver nanoparticles as drug/synthetic substance carriers was developed, and their biological activity was evaluated.

The protective effects of edible coatings made from carboxymethylcellulose and propolis on the shelf life of food products were studied. The findings confirmed that these edible coatings effectively protect the products. Additionally, in the search for new coatings, celery pectin was isolated and characterized, and its potential use as an edible coating for storing blackberries was investigated.

The methods for analysing natural products were further expanded to include the study of fructooligosaccharides, lactose octaacetate, aqueous and acetone extracts of edible plants (pomegranate blossom and orange blossom), and the essential oil from *Hypericum perforatum* L.

➤ *theoretical contributions* – based on the UV-visible spectra, the energies of the ground and excited states were calculated, along with the energy difference between the levels of three of the dyes. It was determined that the smaller the energy difference between the ground and excited states, the easier the charge transfer occurs.

The high significance of the applicant's contributions is supported by the following circumstances:

✓ publication of articles in journals with quartile Q1 – 11 pcs; with Q2 – 2 pcs; with Q3 – 6 pcs, with Q4 – 4 pcs, and without Q – 1 pcs.;

✓ in the 24 scientific publications presented for participation in the competition, a total of 152 citations all, of which are in the Scopus database. According to data presented in Scopus, her author-level *h-index* is 8;

✓ significant number of participations in national and international scientific forums – 15 in the last to two years.

The preparation and conducting of new exercises and lectures, as well as the participation of Assist. Prof. Dr. Todorova as a co-author in a 2 university textbooks confirms her qualities as a teacher.

I explicitly grant a high assessment to the scientific and scientific-applied work presented by Assist. Prof. Dr. Mina Todorova in the field of the design, synthesis, and characterization of new styrylquinolinium compounds with potential nonlinear optical activity, as well as her research on the biological activity and pharmacological potential of propolis. Dr. Todorova has an *h-index* of 8, and the submitted reference for meeting the minimum national requirements for holding the academic position "Associate Professor" demonstrates that she surpasses the requirements for all group indicators, achieving 809 points, with the required minimum being 400 points.

#### **4. Critical remarks and recommendations**

I have no critical remarks about the materials presented.

## CONCLUSION

The documents and materials presented by Assist. Prof. Dr. Mina Mihaylova Todorova for this competition meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of the ZRASRB and the relevant Regulations for the Development of the Academic Staff of PU "Paisii Hilendarski".

The candidate in the competition has submitted a sufficient number of scientific works published after the materials used in the defence of the PhD Degree and Chief Assistant professor. The applicant's works contain original scientific and applied contributions that have received international recognition, the main part of which has been published in scientific journals issued by international academic publishing houses. The scientific and teaching qualifications of Assist. Prof. Dr. Mina Todorova are unquestionable.

The achievements of the Assist. Prof. Dr. Todorova results in the educational and scientific research activities fully correspond to the minimum national and specific requirements of the Faculty of Chemistry of the University of Plovdiv "Paisii Hilendarski", adopted in connection with the Regulations of the PU for the application of ZRASRB.

After familiarizing myself with the materials and scientific works presented in the competition and analyzing their significance, I find it reasonable to give my positive assessment and to recommend to the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Chemistry for the selection of Assistant Prof. Dr. Mina Mihaylova Todorova to the academic position of "Associate Professor" at University of Plovdiv "Paisii Hilendarski" in: field of higher education 4. Natural sciences, mathematics and informatics professional direction 4.2. Chemical Sciences (Organic chemistry, Bioorganic chemistry).

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Prepared the opinion: .....

/Assoc. Prof. Dr. Maria Angelova-Romova/