

## **REPORT**

by

assoc. prof. Rayna Georgieva Bryaskova PhD,

member of the academic jury set to render a decision on the competition for occupying the academic position "Associate Professor" in Professional Field 4.2. Chemical Sciences /Polymers and Polymeric Materials/, published in SG No.65 on August 12th, 2022

This Report is prepared in response to Order № RD-09-148/11.10.2022 issued by the Director of the Institute of Polymers, Bulgarian Academy of Sciences. The Report is in compliance with Development of Academic Staff in the Republic of Bulgaria Act (DASRB), the Rules for the Application of the Development of Academic Staff in the Republic of Bulgaria Act, the Rules of BAS and with the Rules set at the Institute of Polymers-BAS, for applying the Acts aforementioned.

The only candidate in the competition for the academic position "Associate Professor" in professional field 4.2. Chemical Sciences (Polymers and Polymeric Materials), announced in SG No. 65 of 12.08.2022 for the needs of the "Macromolecular Engineering" Laboratory at the IP-BAS, is the Assist. Prof. Dr. Radostina Genova Kalinova, who is the only candidate in the competition. The documents presented by Dr. Kalinova meet all the regulatory requirements related to DASRB.

### **1. Assessment of the scientific and research accomplishments of the candidate**

Assist. Prof. Dr. Radostina Genova Kalinova participated in the competition with 18 scientific works, which did not repeat the publications presented for the acquisition of the educational and scientific degree "doctor". Of the 18 publications presented, 17 are referenced and indexed in the world-renowned databases Scopus and Web of Science with an impact factor and fall into quartiles Q1 to Q4 according to the grouping of scientific journals, and one of them is with JCR without IF.

Seven of them are published in the last 5 years and nine of them are in Q1. In indicator C.4, 5 publications in total are presented, which are equivalent to a habitation thesis, four of which fall into quartile Q1, which is indicative of the high quality of the candidate's research, and one of them is in Q2. In four of them, Dr. Radostina Kalinova is the first author, which confirms the significant contribution to their development and publication. The publications in this group give a total of 120 points out of the minimum required 100 points. Indicator G.7 includes the remaining 13 scientific works, carrying a total of 241 points out of the minimum required 220. Of these, 5 publications are in quartile Q1, 2 publications are in Q2, 3 publications in Q3 and one with SCR without impact factor. Indicator D.11 presents 140 citations noticed on the publications presented in the contest, which give 280 points out of the required 60 points. The significant number of noticed citations on the presented scientific works shows the high scientific potential of the conducted scientific research. In indicator E, which is not mandatory for holding the academic

position of "associate professor", assist. Prof. R. Kalinova scored 691 points out of 430 points, which are result of participation in 13 research projects with national and /or European funding.

The presented assessment shows that according to all groups of indicators, the candidate Assist. Prof. Dr. Radostina Genova Kalinova exceeds the minimum requirements for holding the academic position "Associate professor".

The main contributions under **indicator B4** can be summarized as follows:

- Design and synthesis of new functional amphiphilic block copolymers obtained by combining different polymerization techniques such as controlled atom transfer radical polymerization, ring-opening polymerization, and "click" chemical reactions. The synthesized copolymers self-associate in an aqueous environment with the formation of well-defined micelles, which are distinguished by excellent stability. The successful loading of hydrophobic drugs such as phenethyl ester of caffeic acid (CAPE) as well as the natural drug curcumin shows that they have a potential for nanomedicine applications as an effective drug delivery vehicle.
- Preparation of nanosized polyplexes based on poly(ethylene glycol) methacrylate (POEGMA) and poly(L-lysine) (PLL) hybrid block copolymer, which can be used as non-viral vectors for gene delivery.
- Preparation of a hybrid linear block copolymer based on ethylene oxide and L-lysine, with proven ability to complex with insulin, which shows their potential as nanocarriers of proteins and peptides for *in vivo* applications.

The main contributions under **indicator G7** are grouped in the following main directions:

- Design and synthesis of functional polymeric nanocarriers with effective targeted cellular and subcellular delivery of the natural medicinal substance curcumin.
- Preparation of functional copolymers with linear polyglycidol as a nonionic hydrophilic block and a second block bearing pendant aminohydrochloride groups that form aggregates capable of condensing DNA into stable and compact nanosized polyplex particles.
- Synthesis of new linear copolymers based on poly(dimethylsiloxane)-block-poly(acrylic acid) copolymers with different second block lengths, which were studied for their ability to aggregate, depending on their concentration, the second block length and the type of solvent.
- Preparation, characterization and potential application of polymers and polymer films for supercapacitors, polymer-photovoltaic cells and LEDs.
- Investigation on the olefin metathesis for the preparation of small acyclic molecules and macrocycles.

## 2. Opinions, recommendations and notes

I have no critical remarks or recommendations on the applicant's documents.

I know assist. prof. Dr. Radostina Kalinova as a hardworking, goal-oriented and determined person who follows the implementation of the assigned tasks with precise accuracy and great scientific

potential. That is why I think that Dr. Radostina Kalinova, is a worthy candidate for the academic position of "associate professor" under the current competition.

### 3. Conclusion

On the basis of the documents presented by Assist. prof. Dr. Radostina Genova Kalinova in the competition for the academic position "associate professor" in professional field 4.2. Chemical sciences (Polymers and polymeric materials) and the evaluation of the scientific and scientific-applied contributions of the presented publications demonstrated that the applicant exceed the requirements for holding the academic position of "associate professor" defined in the Development of Academic Staff in the Republic of Bulgaria Act (DASRB), the Rules for the Application of the Development of Academic Staff in the Republic of Bulgaria Act, the Rules of BAS and the Rules set at the Institute of Polymers-BAS, for applying the Acts aforementioned. Therefore, I give a **positive assessment** to the candidate and recommend to the Scientific Council of the Institute of Polymers-BAS to support the election of assist. prof. Radostina Genova Kalinova to hold the Academic Position "Associate Professor" in the professional field 4.2. Chemical Sciences (Polymers and Polymeric Materials).

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Sofia

Report prepared by:

/assoc. prof. Rayna Bryaskova, PhD/