

STATEMENT

from Prof. Ivanka Borisova Stoineva, Dsc

Institute of Organic Chemistry with Centre of Phytochemistry, BAS (associate member)

Member of the Scientific Jury according to order № RD-09-94/19.04.2021 of the Director of IOCCP-BAS

Subject: PhD thesis for awarding the educational and scientific degree "Doctor", in the field of higher education "Natural Sciences, Mathematics and Informatics", professional field 4.2."Chemical Sciences", scientific specialty "Bioorganic Chemistry, chemistry of natural and physiologically active compounds"

PhD Candidate: Boryana Krasimirova Yakimova

Topic: Design and synthesis of biologically active peptides as potential inhibitors for Angiotensin converting enzyme (ACE I)

Supervisor: Prof. DSc Ivanka Stoineva

The PhD student Boryana Yakimova presented a PhD thesis, abstract and the set of documents that are in accordance with the requirements for obtaining the scientific and educational degree "doctor", reflected to the Law for the Development of the Academic Staff in the Republic of Bulgaria, The Regulations of BAS for the Implementation of this Law and the Rules of IOCCP-BAS.

The minimum national requirements for obtaining the educational and scientific degree "Doctor" are also met:

- group A - dissertation work for obtaining ONS "Doctor" - 50 points at required 50;
- group G - 4 scientific publications are presented - 67 points at required 30 points.

Boryana Yakimova received a bachelor's degree in 2005, and in 2007 successfully defended a master's degree in "Industrial Biotechnology", Faculty of Biology at Sofia University "St. Kliment Ohridski ". Due to her interest to the science , in 2005 she was appointed as a biologist, and since 2007 as an assistant in the Laboratory of Chemistry and Biophysics of Proteins and Enzymes.

The PhD thesis of Yakimova is in the field of bioorganic chemistry in particular peptide chemistry and its application. It is very relevant because it reflects research addressed to socially significant problems in medicine such as hypertension and cardiovascular diseases.

The main tasks of the dissertation are focused on the synthesis of biomolecules with potential application as inhibitors of an important enzyme (ACE I) in the renin-angiotensin system. The PhD student has very successfully mastered basic methods in solution and on a solid phase carrier for the synthesis of short-chain peptides and conjugates of mono- and disaccharides with amino acids. The resulting new compounds would find application in the prevention of hypertension and as well as dietary supplements.

During the elaboration of the PhD thesis Yakimova used modern HPLC technique for purification of the synthesized new peptide and carbohydrate hybrid structures. The chemical structure and purity of the new biomolecules were proved by NMR and MS analysis, and IR spectroscopy was used to determine the conformation of some of the target molecules.

PhD student Yakimova perfectly manages with serious scientific challenges (theoretical and experimental) thanks to her diligence, systematic work, enviable experimental dexterity and successfully entered into a new scientific topic for her.

I have witnessed the impressive research work done with the application of a large number of experimental methods, which undoubtedly contributed to its scientific growth in the field of peptide chemistry.

The obtained results from the investigations conducted in the thesis of Boryana Yakimova are summarized in 4 research papers, published in (*Farmacia* ;**Q2, IF 1.607**, *Bulgarian Chemical Communications Special Issue E*) **Q4, IF-0.238**, *J.of Mol. Struc.* **Q2, IF-2.12** , *Protein Pept. Lett.*, **Q3 IF-1.16**. A total of 11 citations have been noticed, which is indicative of the topicality of the scientific results.

Some of the results of Yakimova PhD thesis were promoted at a total of 14 national and international scientific forums as posters or oral presentations.

Although there are always technical errors and inaccuracies, I have no critical remarks on the PhD thesis of Yakimova.

CONCLUSION

Presented in the thesis results fall into the category enriching existing knowledge in the field of bioorganic chemistry and have fundamental and applied science.

PhD student Yakimova is a serious and promising researcher with extensive knowledge and experimental skills in the field of peptide chemistry and bioorganic synthesis.

In my opinion, results are presented in sufficient volume and with original scientific contribution, which cover and exceed the requirements for awarding the scientific and educational degree "Doctor", according to the Law for Development of the Academic Staff in the Republic of Bulgaria. The Regulations for application of the Law of the Bulgarian Academy of Sciences and the Rules of Procedure of the IOCCP-BAS.

Therefore, I confidently give my positive assessment of the results achieved in the dissertation and I am pleased to recommend to the Honored Scientific Jury to award to Boryana Krasimirova Yakimova the educational and scientific degree "Doctor" in professional field 4.2. "Chemical sciences", scientific specialty "Bioorganic chemistry, chemistry of natural and physiologically active substances".

13. 05. 2021

Prof. DSc Ivanka Stoineva