

OPINION

by Prof. Dr. Lyudmila Vladimirova Kabaivanova - Milanova, Institute of Microbiology "Stephan Angeloff" - BAS, elected as a member of the Scientific Jury by order No. I - 64/29.05.2023 of the Director of the Institute of Microbiology "Stephan Angeloff", on a dissertation with the thesis "Mechanisms of modulating the processes of obesity in an in vitro model of human adipocytes by applying biologically active molecules" with an author - Master of Pharmacy Martina Stoyanova Savova for the acquisition of the educational and scientific degree "doctor" in the field of higher education: 5. Technical sciences, professional direction 5.11 Biotechnologies (Technology of biologically active substances) with scientific supervisor Prof. Dr. Milen Georgiev

As a member of the scientific jury, I have received all the necessary documents for disclosure of the procedure for the defense of the dissertation work by Martina Stoyanova Savova, MSc, Pharmacist, according to the LDASRB and the regulations for its application.

Martina Stoyanova Savova received her higher education at the Faculty of Pharmacy in the Medical University of Plovdiv and received a qualification - Master of Pharmacy in 2019, after which she enrolled as a full-time doctoral student at the „Stephan Angeloff“ Institute of Microbiology, in the Laboratory of Metabolomics.

The dissertation work developed by PhD student Savova presents the results of an in-depth study in a finished form. It consists of 8 sections, 15 chapters and includes 38 figures.

The abstract contains all the necessary sections and represents clearly and in detail the results obtained by showing the contributions achieved.

The rich bibliographic reference speaks of a very good knowledge of the subject, which is undeniably current, since the spread of obesity has reached epidemic proportions in recent decades, as it also affects very young people. In addition, unwanted obesity is not an independent problem, but causes the occurrence of concomitant diseases with increased frequency.

The studies and experimental work carried out are aimed at developing means for the prevention and therapy of obesity and represent an in-depth study of the molecular mechanisms

and modulation of signaling pathways related to adipogenesis, energy metabolism, intercellular and intracellular communication. Taking the right actions, such as exploring the potential to influence these molecular pathways through the administration of plant secondary metabolites, demonstrates a promising approach to obesity prevention.

The main objectives and achieved results in the dissertation work are based on the application of an in vitro platform for evaluating the effect of plant extracts and their metabolites on the function and physiology of fat cells, as the main structural units of adipose tissue, and modulating their inflammatory response.

In her research work, the candidate applies a wide range of modern techniques and the skillful handling of state-of-the-art experimental approaches for the development of new experimental model systems is visible. An in vivo model of glucose-induced obesity in *Caenorhabditis elegans* was also used.

In the present dissertation, the results were achieved through a combined approach between molecular pharmacology and ethnopharmacology by identifying plant secondary metabolites with the potential to favorably influence obesity and determining their molecular mechanism of action.

At the end of the dissertation, six important conclusions from the research are presented. I accept the author's contributions of scientific-fundamental and scientific-applied nature.

On the topic of the dissertation, Martina Savova has presented six scientific papers, four of which fall into Q1, which is the absolute proof of the significance of the obtained results and their reflection in the international scientific space.

The PhD student has participated and presented her thesis work at six international scientific forums.

According to the regulations for the activities of the Training Center and the Academic Council of the Bulgarian Academy of Sciences, the doctoral student has collected credits under item 1 - 170 credits with a mandatory minimum of 130, under item 2 - 88 credits with a mandatory minimum of 40 and under item 3 - 47.3 credits out of a mandatory 30. From the total amount of 305.3 credits, with the required 200 credits, it can be seen that the received credits exceed the requirements.

CONCLUSION

The presented dissertation fully complies with the requirements of the LDASRB and the Regulations for its Implementation and the Regulations for the Acquisition of Scientific Degrees and Occupancy of Academic Positions in the Bulgarian Academy of Sciences and the “Stefpan Angeloff” Institute of Microbiology.

My assessment of the dissertation work, the abstract, scientific publications and scientific contributions, as well as the credits achieved by Martina Savova, is expressly positive.

The presented results are original, up-to-date and of public importance. They reveal opportunities and perspectives for new research on current problems aimed at applying the biological activities of various plants as valuable pharmacological agents in the prevention of obesity as a socially significant problem. The achieved results give me the reason to propose to award the educational and scientific degree "doctor" to Martina Stoyanova Savova, in the field of higher education 5. Technical sciences, professional direction 5.11 Biotechnologies (Technology of biologically active substances).

30.07.2023

Prepared by:

/prof. Dr. Lyudmila Kabaivanova/