P-HO-257/19.11.2024

Review for ESD „Doctor“

STANDPOINT

from prof. Maya Boyanova Georgieva, PhD – Department of Pharmaceutical chemistry, Faculty of Pharmacy, Medical University - Sofia

of a dissertation for awarding the educational and scientific degree **'doctor'**

professional direction *7.3 "Pharmacy"*

doctoral program. *"Pharmaceutical chemistry"*

Author: *Vanya Rangelov Kojuharov*

Form of doctoral studies: regular

Department: Pharmacognosy and pharmaceutical chemistry

Topic: *Modern guidelines and pharmacoanalytical approaches in doping prevention.*

Scientific supervisor: *assoc.prof. Kalin Ivanov, PhD – Faculty of Pharmacy, MU – Plovdiv*

1. General presentation of the procedure and the PhD student

The presented set of materials on paper / electronic media is in accordance with Art. 70 (1) of I. Sec. Acquisition of educational and scientific degree "DOCTOR" and scientific degree "DOCTOR OF SCIENCES" at MU-Plovdiv; Regulations of MU-Plovdiv dated 28.01.2021 and includes the following documents:

- Application to the Rector of MU-Plovdiv for disclosure of the procedure for the defense of a dissertation work
- CV in European format with the doctoral student's signature
- a notarized copy of a higher education diploma
- orders for enrollment in doctoral studies; for deduction with right of defense
- an order for conducting an exam from the individual plan and a corresponding protocol for a passed exam or doctoral minimum in the specialty
- minutes from the departmental council for the preliminary discussion of the pre-dissertation work and the decisions taken for the disclosure of the procedure and for the composition of the scientific jury
- certificate of received credits from the group study plan at the Doctoral School of MU-Plovdiv;
- dissertation work
- abstract
- a list of scientific publications on the topic of the dissertation
- copies of scientific publications
- list of participations in scientific forums
- declaration of originality and authenticity of the attached documents

The doctoral student has attached **3** (three) scientific publications, of which **2** with **IF**. I accept all scientific papers as related to the topic of the developed dissertation work. In all publications, the PhD student is the first author.

I have no notes or comments on the documents.

2. Relevance of the topic

In recent years, unintentional doping has become a seriously discussed social and scientific problem. Numerous cases of unintentional doping have been registered due to the intake of dietary supplements (DS) containing undeclared prohibited substances. At the same time, the use of DS is considered an essential part of the diet of professional athletes, and in recent years there has been a trend towards higher levels of intake of such products, not only among elite athletes, but also among diverse groups of consumers.

Currently, doping prevention strategies are considered a current and urgent problem. Doping prevention has not only a serious ethical aspect, but is a key element in preserving the health of athletes. One of the main pillars of these strategies includes monitoring the quality of DS before they are included in the diet, as well as raising the awareness of athletes and their teams about the "hidden" risks of doping.

3. Knowing the problem

The literature review is comprehensive, the information in it sheds light on the essence of the problems and challenges discussed in the dissertation work in conducting the intended study regarding the presence of undeclared substances in commercial products that are naturally present in the phytochemical composition of plant extracts (e.g. higenamine, methylhexamine, etc.); the use of doping-contaminated compounds (e.g. anabolic agents, sibutramine, clenbuterol) in food supplements and, last but not least, the insufficient awareness of athletes and their teams regarding the possibilities for doping prevention and the risks of unintentional doping.

The review is written concisely and with understanding, but at the same time it is comprehensive and fully reflects the existing problems related to the low control in the registration and trade of dietary supplements, as well as the need to develop and implement new analytical approaches to prove and quantify prohibited substances in DS, often causing unintentional doping.

4. Research methodology

In the Materials and Methods section, the dissertation author has provided a detailed description of the methodologies used in this scientific work. Their presentation shows that the dissertation has been developed using appropriately and correctly selected methods, allowing for the achievement of the set goal and obtaining an adequate answer to the tasks solved in the dissertation.

It is striking that a very diverse methodology has been applied in the work, which does not raise any doubts, which is a prerequisite for obtaining correct results.

5. Characterization and evaluation of the dissertation work and contributions

The dissertation is formatted into 159 standard pages and includes the following main elements: Table of Contents – 1 page, Abbreviations and Symbols – 3 pages, Introduction – 1 page, Literature Review – 29 pages, Scientific Hypothesis, Goals and Objectives – 1 page, Materials and Methods – 13 pages, Results and Discussion – 65 pages, Conclusion and Future Directions – 3 pages; Conclusions – 1 page, Contributions – 2 pages, List of scientific publications and participation in scientific forums related to the dissertation – 1 page, Bibliography – 23 pages, Appendices – 14 pages.

The results obtained in the dissertation are illustrated with 48 figures and 22 tables. 249 literary sources are cited, of which 62 from the last 5 years and 128 from the last 10 years. Citations of official Internet sites containing data updated for the last 5 years are attached. All sources used, except 1, are in Latin.

The goals of the dissertation and the 8 specific and logical tasks identified arise from the literature review. The conclusions (8 in number) are adequate and correctly reflect the results of the conducted research.

The contributions made in the developed dissertation work can be summarized and include a systematized description of a group of pharmacologically active substances, contaminants of food supplements, such as sibutramine, anabolic steroids and diuretics. An effective complex strategy for the prevention of unintentional doping is proposed, through different approaches that can find real application in different laboratories. Innovative, fast and sensitive analytical methods have been created, using the tools of HPTLC, GC-MS, HPLC-UV and LC-PDA methodologies for the determination of target doping components in food supplements.

6. Assessment of dissertation publications and personal participation of the PhD student

The results of the research conducted in the doctoral candidate's scientific work are reflected in **3** scientific publications, **two** of which were published in a journal with **IF**. It is worth noting that in **all** scientific works related to the dissertation, the doctoral candidate is the **first author**, which unconditionally proves her personal participation in the research conducted, and determines the personal merit to the formulated contributions and the obtained results. The presented works logically reflect the results obtained by the doctoral candidate. The total number of **citations** in **Scopus** is **45**, of which one article was cited 41 times.

Parts of the dissertation were presented at 2 scientific forums, 1 of which was international, where the doctoral student was awarded a Certificate for the best oral presentation at the 9th International Conference of Young Scientists 2022, Plovdiv, July 14 – 15, 2022.

In addition to the above, the personal contribution of the doctoral student is clearly visible from the additional activities carried out by her, directly related to the topic of the dissertation work and including a participation in a scientific project entitled „Contemporary aspects and pharmacoanalytical approaches in doping prevention“ with scientific supervisor assoc. prof. Kalin Ivanov, PhD and leading scientist – PhD student Vanya Kojuharov.

With regard to these scientometric indicators, the dissertation student meets the requirements for awarding the educational and scientific degree "Doctor", laid down in the Regulations for the development of the academic staff at the MU – Plovdiv with a total number of points under indicator group D of 47 points.

7. Abstract

The abstract is formatted into 57 pages in accordance with the established requirements and correctly reflects the main applications and scientific and applied contributions of the dissertation work.

CONCLUSION

The dissertation contains ***scientific, scientific-applied and applied results, which represent an original contribution to science*** and **meet all the requirements** of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of ZRASRB and the relevant Regulations of the Medical University - Plovdiv. The presented materials and dissertation results **fully** correspond to the specific requirements of the MU - Plovdiv.

The dissertation shows that the doctoral student *Vanya Rangelov Kojuharov* **possesses** in-depth theoretical knowledge and professional skills in the scientific specialty "Pharmaceutical chemistry" by **demonstrating** qualities and skills for independent conduct of scientific research.

Due to the above, I give my ***positive assessment*** of the conducted research, presented by the above-reviewed dissertation work, abstract, achieved results and contributions, and I ***propose to the honorable scientific jury to award the educational and scientific degree "doctor"*** to Vanya Rangelov Kojuharov in a doctoral program in " Pharmaceutical chemistry" in Higher Education District 7. "Health and Sports", Professional Direction 7.3 "Pharmacy".

Заличено на основание
Чл.5 §1, б."В" Регламент (ЕС)2016/679

15.11. 2024

Reviewer: ....

prof. Maya Georgieva, PhD