Statement/Evaluation Report

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In my capacity as a member of the Scientific Jury, appointed by Order No. R-109-269/18.06.2025 of the Rector of the Medical University “Prof. Dr. Paraskev Stoyanov” – Varna, and pursuant to Articles 258–269 of the Law on Obligations and Contracts, I am presenting this statement under Protocol No. 1/26.06.2025 of the Jury meeting, regarding the dissertation thesis of Ivaylo Konstantinov Pehlivanov submitted for the award of the educational and scientific degree *Doctor*.

Introduction

The dissertation thesis, carried out at the Medical University “Prof. Dr. Paraskev Stoyanov” – Varna, Faculty of Pharmacy, addresses a highly relevant problem in the field of pharmacology and pharmaceutical technology. Its primary objective is the optimization of the oral bioavailability of sodium alendronate through the development of innovative lipid-based self-emulsifying drug delivery systems. The topic is clearly defined, in line with the priorities of contemporary pharmaceutical science, and socially significant given the wide application of bisphosphonates in the treatment of osteoporosis and related diseases. The thesis demonstrates an interdisciplinary concept that combines a critical literature review, well-designed experimental work, and meaningful interpretation of the results.

General Impressions

The overall impression is consistently positive. The dissertation is structured in accordance with academic standards, written in a precise and accessible scientific style, and reflects the author’s solid preparation and ability to systematize complex information. The methodology is appropriate and applied rigorously, integrating both established and modern approaches. The research is logically structured, the transitions between sections are coherent, and the conclusions are clearly formulated. The study is well contextualized within the international literature and demonstrates both scientific relevance and practical potential.

Content Analysis

The content of the thesis includes a comprehensive literature review that critically evaluates current knowledge on bisphosphonates, sodium alendronate, and lipid-based delivery systems, and convincingly defines the research gap. The experimental work is extensive and methodologically robust, covering solubilization studies, determination of HLB values, pseudo-ternary phase diagrams, stability testing, in vitro release and permeation studies, as well as in vivo pharmacokinetics. The applied methods are validated and comply with international standards. The results are presented clearly, supported by tables, graphs, and figures, and are analyzed critically with comparisons to existing literature. The conclusions are logically derived from the evidence and correspond fully to the defined objectives.

Contributions

The main scientific contribution of the dissertation lies in the development and characterization of novel self-emulsifying lipid systems, including double SEDDS, that improve the absorption of sodium alendronate, as well as in establishing correlations between their physicochemical characteristics and pharmacokinetic parameters. The thesis also validates an analytical UV/Vis method for quantitative determination of alendronate in biological media and provides a critical evaluation of the role of excipients in the stability and performance of the systems. From an applied perspective, the research demonstrates therapeutic potential for improved oral bioavailability of alendronate, provides results of practical relevance for future pharmaceutical product development, and has clear educational value for integration into the teaching of pharmaceutical technology and biopharmacy.

Remarks and Recommendations

Some remarks are worth noting. In Section 3.3, the term “solubilization” is used to designate a procedure for filtrate preparation for quantitative analysis rather than the solubilization process itself, and in future publications it would be advisable to maintain this distinction. In several cases, data are presented in both tables and figures without additional interpretative value, creating unnecessary duplication and somewhat burdening the text. The results of pharmacopoeial tests are presented mainly as mean values, and a more detailed statistical treatment would have strengthened the conclusions. In the discussion of pharmacokinetic results, there is limited emphasis on inter-individual variability, which is particularly relevant for bisphosphonate therapy. Finally, the literature review is heavily focused on international sources, while research from Bulgaria is underrepresented. These observations do not diminish the scientific value of the work, but they should be considered in future academic publications.

Conclusion

In conclusion, the dissertation thesis of Ivaylo Konstantinov Pehlivanov represents an independent, thorough, and timely scientific study, making significant contributions to both scientific and applied fields. The research has been carefully executed, the results are reliable and well-founded, and the presentation is academically sound. For these reasons, I confidently give a positive evaluation and recommend the award of the educational and scientific degree “Doctor” to Ivaylo Konstantinov Pehlivanov.

Sofia, 26.08.2025 Signature:

/Ch. Tzachev/