

OPINION

by Assoc. Prof. Dr. Filka Georgieva Georgieva Ph.D.

Member of the scientific jury appointed by Order № P-109-152 / 13.04.2022

of the Rector of the Medical University, Varna

Subject: dissertation for the award of the educational and scientific degree "Doctor" by Julian Zlatkov Penev, PhD student in independent form of study in the doctoral program "Dermatology and Venereology", professional field 7.1 Medicine at MU-Varna on: "**Opportunities for laser rejuvenation and the aestheticization of facial skin.**"

1. Relevance of the topic

The dissertation of Julian Penev is a comprehensive, and innovative study of the possibilities of carbon dioxide laser for the treatment of dermatoses located on the face. The development contains information about the effect of CO₂ laser in the therapy and aestheticization of facial skin, comparing and analyzing photographic material from his own clinical practice and optimized therapeutic techniques to achieve maximum aesthetics of the final result. The relevance of the presented study is determined by the fact that so far there is no systematic scientific data on the biophysical justification of the processes of ablative impact. In this regard, the presented extensive study provides valuable information on the applicability of laser effects for the treatment and aestheticization of facial skin. In this sense, the presented dissertation is a work not only with scientific, but also with scientific-applied value and significance.

2. Main characteristics of the dissertation

The dissertation presented for an opinion is developed on 233 pages and includes a text structured in the following sections: Introduction, Literary, Review, Aim and Tasks, Material and Methods, Results, Conclusions and Contributions. 188 figures, 2 graphs, 7 tables and 6 appendices, containing additional photo-documentary material, references to previous author's contributions, publications and participation in scientific forums. The bibliographic reference includes a total of 105 literary sources, of which 20 in Cyrillic and 85 in Latin. The sections of the dissertation are well developed with mostly practical orientation. **The title** of the dissertation clearly and accurately reflects its content. The introduction logically and appropriately points to the importance of the considered problem related to the use of the healing potential of the CO₂ laser.

The literature review is 26 pages long and covers information on the history, physical basis, main characteristics of laser light, laser beam and its directional systems and the interaction of light radiation with the skin. I believe that the structure of the literature review is correct and has a direct bearing on the goals of the dissertation and the tasks set. The information in it was gathered after reviewing a significant number of literature sources. This fact speaks of the excellent knowledge of the doctoral student on the scientific problem as well as his ability to summarize and analyze the literature.

The aim of the dissertation is clearly formulated, the set seven tasks are developed and presented in a logical sequence and correspond directly to the set goal. The work is at a modern scientific level, realized on the basis of application of own models for analysis, allowing to achieve the set goal and to obtain an adequate answer to the tasks solved in the dissertation. The used statistical methods and specialized software are properly selected and allow to obtain and comparisons qualitative analysis of specific results. The results are skilfully discussed and summarized in the conclusions of the dissertation. It should also be emphasized that they are richly illustrated. The benefit of the work is also that the follow-up of patients is for a long period of time. The dissertation in its essence is close to a complete and extremely informative atlas in the field of laser procedures in the face.

Of interest is the author's procedure for the treatment of age-related and prolonged juvenile acne. Special attention should be paid to the analysis of early and late reactions, limitations and risks associated with the procedure. This makes an important contribution in connection with the need to develop safer and more effective methods for the treatment of facial dermatoses. Especially valuable are the results, revealing the good potential in preparing a personalized plan for aestheticization and rejuvenation of facial skin by applying CO₂ lasers. The obtained results also reveal the significant possibilities of laser therapy in a number of benign skin lesions affecting the patient's quality of life due to their location on the visible parts of the face.

The dissertation has the following **original contributions**: Laser ablation is defined in a new way as thermoradiation self-limiting ablation and is applied by the author as two techniques - Laser Fast 139 Draw Ablation (LFDA) and One Shot Ablation (OSA). This terminology and techniques, as well as their abbreviations, are introduced by the author, and are described for the first time here. Laser ablation at 10600 nm is considered not as a non-selective effect, but as a controllable physical process for ablative destruction of bulky pathological lesions with maximum sparing of the underlying and surrounding tissue structures. A new physical model for skin retraction in ablative laser resurfacing is described, due to irreversible structural changes in the triple helix of collagen, explaining the lifting effect. An original contribution is the author's approach to skin pathology and regenerative processes in evolutionary aspect. The understanding of selective laser thermolysis is clarified and revised.

From such presented scientific work it is clear that the author has many years of experience, wide information and good knowledge of the problems. I believe that the comparison with national and international experience in this field would further express the critical assessment and would contribute to emphasizing the innovative methodologies described in the scientific work.

The formulated **conclusions** as a result of the made development are logical and in accordance with the presented results.

The results of the author's many years of experience are periodically reflected in the scientific literature, and 26 articles on the topic have been published in Bulgarian and English in the period 1998-2021. The doctoral student is the first author of all publications.

The **abstract** reflects correctly and fully the content of the dissertation.

3. Summary assessment of the dissertation and conclusion.

Based on what was written earlier, I believe that the dissertation is characterized by relevance, independence, originality, theoretical and methodological strength. I give a **positive assessment** of the dissertation "Opportunities for laser rejuvenation and the aestheticization of facial skin." I recommend to the esteemed members of the scientific jury to award Julian Zlatkov Penev the educational and scientific degree "Doctor".

02.05.2022

Varna

Member of SJ



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