

To the Chairman of the Scientific Jury,
appointed by order of
The Rector of the Medical University - Plovdiv,
№ P-1491 / 13.09.2021г.

STATEMENT

**From Assoc. Prof. Dr. Georgi Papanchev, MD,
Department of Oral Surgery,
Faculty of Dental Medicine,
Medical University Varna**

Address and contacts:

Varna 9000, 84A Tsar Osvoboditel Blvd.

Tel: 0889306465

Under the procedure for defense of a dissertation for the award of educational and scientific degree "Doctor" in the field of higher education 7. Health and sports in professional field 7.2. Dental Medicine; doctoral program "Periodontology and oral diseases" at the Department of Periodontology and diseases of the oral mucosa, FDM, MU-Plovdiv.

Author of the dissertation: Dr. Ivan Venkov Nachkov

Form of doctoral studies: self-study

Topic: Laser-assisted therapy of periimplantitis with Er: YAG laser

Supervisors: Assoc. Prof. Dr. Georgi Tomov, MD

Prof. Dr. Plamen Zagorchev, Ph.D.

General presentation of the procedure and the doctoral student:

The presented set of materials on paper and electronic media is in accordance with the Procedure for acquiring ONS "Doctor" in the field of higher education 7. Health and sports in professional field 7.2. Dental Medicine;doctoral program "Periodontology and oral diseases" at the Department of Periodontology and oral diseases, FDM, MU-Plovdiv and includes all necessary documents.

Dr Ivan Venkov Nachkov was born on January 31, 1977. In 2004 graduated with a master's degree in dentistry. In 2009 acquired a degree in maxillofacial surgery, and in 2013 graduated with a master's degree in medicine from MU - Plovdiv. In the same year he was appointed as an assistant in the Department of Periodontology and oral diseases, FDM, MU-Plovdiv.

On 15.07.2019 is enrolled as a doctoral student in independent training indoctoral program "Periodontology and oral diseases" at the Department of Periodontology and oral diseases, FDM, MU-Plovdiv by order of the Rector № R-1588 / 23.07.2019 and was expelled by order № P-1491 / 13.09.2021.

Notes and comments on the documents:

The dissertation contains 197 standard pages. It is illustrated with 4 tables and 71 figures. The literature review is in-depth and shows a detailed knowledge of the problem. It includes 326 literary sources, of which 8 are in Cyrillic and 318 in Latin. It is presented on 49 pages, purpose and tasks - 2 pages, material and methods, own results and discussion - 65 pages, conclusions 4 pages, contributions - 2 pages.

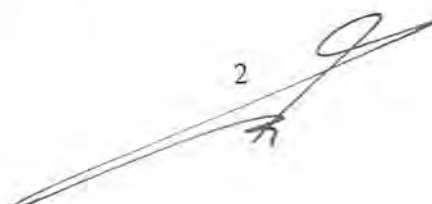
The abstract meets all the requirements of the Law for the development of the academic staff in the Republic of Bulgaria.

The doctoral student has attached 3 publications in which he is the first author.

Assessment of the personal participation of the doctoral student in the dissertation

The presented dissertation examines a current problem in modern dentistry, namely treatment of periimplantitis associated with the use of ER: YAG lasers. Their application in dentistry is based on their unique wavelength (2940 nm) with peak absorption in water and hydroxylapatite. Due to this property ER: YAG lasers are used with equal success in the treatment of hard and soft tissues and are used in the treatment of inflamed

2



peri-implant areas. For the long-term success of dental implants, it is important to define the factors leading to the destruction of the supporting bone and to create a healing concept that predictably stops this process and even encourages the periodontist to regenerate tissue loss.

Dr. Nachkov has made a thorough, critical literature analysis on the subject, which gives him reason to formulate the exact purpose of his study: "To study Er: YAG laser-assisted therapy of periimplantitis through experimental, laboratory and clinical methods."

To achieve this goal it sets the following tasks:

1. To conduct a scanning electron microscopy and comparative analysis of structural changes on the titanium surface after treatment with Er: YAG and diode lasers.

2. To study the changes in temperature in and around the implant during laser irradiation with Er: YAG, CO₂ and diode lasers. This task is divided into two subtasks.

2.1. Subtask. Real-time study of temperature changes using an infrared thermal camera.

2.2. Subtask. The research is performed with the help of an interface integrated digital system with thermocouples.

3. The task. Investigation of the decontamination ability of Er: YAG laser on periodontopathogenic microorganisms.

3.1. Subtask. Determination of the main periodontal pathogens from the peri-implant pocket of patients by Real time PCR reaction.

3.2. Subtask. Investigation of the decontamination efficiency of Er: YAG laser and ultrasonic device with Teflon tip, verified by electron microscope.

3



4. Study of the clinical efficacy of Er: YAG laser in laser-assisted periimplantitis therapy.

The presentation and visualization with figures and graphs of one's own research in terms of materials and methods is at the required level. The studied material is sufficient. Interpretation and discussion of the obtained results was made. The conclusions fully support the results achieved by the doctoral student in connection with laser-assisted therapy of periimplantitis with Er: YAG laser. The contributions described by the dissertation follow the conclusions made, namely:

1. For the first time in our country an electron microscopic examination of implant surfaces treated with Er: YAG laser.

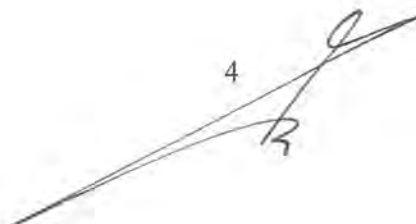
2. The reflection coefficient of the titanium surface during the laser treatment.

3. For the first time, temperature changes in the operating field of thermostated biological model that most closely resembles the physiological conditions in the oral cavity.

4. For the first time, temperature changes were recorded in real time of irradiation through a thermal chamber.

5. For the first time the bactericidal potential of Er: YAG laser detected by scanning electron microscope.

6. Based on the results of laboratory and clinical studies, a surgical protocol has been proposed Er: YAG laser assisted periimplant therapy.

A handwritten signature in black ink, consisting of a stylized 'A' followed by a cursive flourish. To the left of the signature, the number '4' is written in a simple, bold font.

Conclusion:

The dissertation of Dr. Nachkov contains scientific and applied research results that represent **an original contribution to science and meet all the requirements** of the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), Plovdiv. This gives me reason to give my positive assessment of the presented dissertation on "**Laser-assisted therapy of periimplantitis with Er: YAG laser**". I propose to the scientific jury to award the **educational and scientific degree "Doctor"** to Dr. Ivan Venkov Nachkov.

06.12.2021

Prepared the statement:

Assoc. Prof. Dr. Georgi Papanchev, Ph.D.

