



### **Fund “Nauka” Project № 17006 Resume – Competition-Based Session 2017:**

**“Production of allogeneic bone grafts and assessment of the effect of their application by histomorphometric analysis of solid cuts”**

**Project leader:** Prof. Vladimir Emanuilov Panov, MD, PhD, DSc

The aim of this project is to create a scientific infrastructure to ensure the production of allogeneic bone grafts and the subsequent evaluation of their application through histomorphometric analysis of hard sections. The implementation of the project will improve the conditions for the development of research activities at the Medical University of Varna and will expand the treatment and diagnostic possibilities in the field of dental medicine.

Dental implantology plays an important role in the rehabilitation of the dental system. Sometimes implantation in certain areas is difficult due to significant bone deficiency. This requires the application of bone augmentation techniques in order to increase the functional and aesthetic result. Bone repair materials of different origins are used for this purpose. The latter, placed in the receiving box, support tissue regeneration by preserving or restoring volume and quality.

The protocol for the production of allogeneic bone grafts in the established scientific infrastructure / laboratory aims to eliminate the antigenicity and the possibility of transmission of infection from donor to recipient. In certain indications such as horizontal and vertical bone deficiency of the alveolar bone, allogeneic bone grafts are optimal. The reason for this lies in the shortcomings of autogenous grafts.

The introduction of this modern methodology contributes to improving the quality of life and psychoprophylaxis of patients with partial or total edentulousness. It is created on a scientific infrastructure that provides the production of allogeneic bone grafts and the subsequent evaluation of their application through histomorphometric analysis of hard sections.

The following have been developed: a protocol for allogeneic bone treatment and a protocol for histology of hard sections.

The installation of equipment for histology of hard sections allows the improvement of the diagnostics of the diseases affecting the bone system, as well as their application for conducting research in dental implantology and orthopedics. The study of non-demineralized bone samples increases the value and importance of scientific research.

In the long run, the implementation of the project builds on the research activity at the Medical University of Varna in the field of implantology and transplantology.

### **Achieved results:**

1. The following equipment has been delivered and accepted:
  - ❖ Light microscope Leica DM100 Led with color digital camera and histomorphometric analysis software;
  - ❖ Apparatus and consumables for histology of hard sections (precision cutting machine, grinding and polishing machine, epoxy resin, sandpaper, abrasive powder, polishing fabrics, lubricant, diamond paste, aluminum suspension);
  - ❖ Ultrasonic bath;
  - ❖ Kit for mechanical processing of bones;
  - ❖ Alfa 1-2LDPlus lyophilizer;
  - ❖ Belt saw.
2. The following consumables and materials have been delivered and accepted:
  - ❖ Detergent Triton X – 100 – consumable for molecular biology.
3. Activity and professional development of the project team
  - ❖ Dr. Tsvetalina Ivanova Geroval has been enrolled since February 1, 2019 in full-time doctoral studies with the topic: “Study of the results of the application of particulate allogeneic bone material in guided tissue regeneration”, with a supervisor Prof. Stefan Vasilev Peev, MD, PhD, DSc;
  - ❖ Dr. Desislava Kirilova Stoyanova has been enrolled since February 1, 2019 in full-time doctoral studies with the topic: “Histomorphometric analysis of hard sections in the study of subantral bone augmented by lifting the sinus floor with lateral access”, with supervisor Prof. Stefan Vasilev Peev, MD, PhD, DSc.