

New approaches to the modernization of technologies for radiation sterilization of bioimplants

Tuesday, 12 July 2022 13:10 (20 minutes)

Modern requirements for the quality of bioimplants combine the need to ensure not only the necessary osteoinductive potential, adequate structure and mechanical strength, but also guarantees the safety of the recipient due to the high level of sterility of the plastic material.

Among the currently used technologies for the sterilization of biomaterials, radiation exposures occupy an increasing volume [1]. However, the presence of pronounced dose-dependent side effects that can lead to deterioration of all of the above vital properties and characteristics of bone implants determines the need for further improvement of radiation technologies.

One of the promising solutions is the development of combined technologies that combine, along with radiation treatment, other types of physico-chemical effects with a pronounced resultant synergism of sterilization action. As the author's research has shown, one of such promising combinations is two-stage treatment (ozone + radiation) [2]. Further development and improvement of the new technology is carried out in several directions. Firstly, the optimization of the impact parameters at each of the stages. Secondly, the choice of optimal sources (ozone, radiation) effects to ensure the quality of manufactured bone implants, including the characteristics of the surface layer of bone samples [3,4] (relief, microarchitectonics, mechanical characteristics, elemental composition, etc.).

This research has been supported by the Interdisciplinary Scientific and Educational School of Moscow University «Photonic and Quantum technologies. Digital medicine».

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The speaker is a student or young scientist

Yes

Section

1. Nuclear technology and methods in medicine, radioecology

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Session Classification: Nuclear technology and methods in medicine, radioecology.