Contribution ID: **215** Type: **Poster**

Computational approach to the sterilization of the human amniotic membrane using ionizing radiation via GEANT4

In the last decades the use of the Human Amniotic Membrane (HAM) in regenerative and curative medicine has been significantly increased. The sterilization processes of the HAM are crucial for its clinical use. In order to preserve the main biophysical and biochemical properties of HAM, improvements are required in the sterilization procedures, in which some of the valuable HAM's properties are lost. Currently most of HAM's clinical sterilization protocols are based on biochemical processes with antibiotics and glycerol. Recently sterilization studies with ionizing radiation reported up to 25000 Gy radiation sterilization dose to obtain the so-called sterility assurance level. We are considering a simple and valuable approach to the preparation of HAM by antibiotic and glycerol combined with radiation sterilization. In this work we present a GEANT4 study of the interaction of bacterial DNA of "staphylococcus aureos"with two different ionizing radiations.

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Session Classification: Poster Session - MP

Track Classification: Medical Physics