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## THE INTERNATIONAL ATOMIC ENERGY AGENCY RESEARCH ON RADIATION STERILISATION IN TISSUE BANKING

Oleg Belyakov\*

Section of Applied Radiation Biology and Radiotherapy, Division of Human Health, Department of Nuclear Sciences and Applications,  
International Atomic Energy Agency, Vienna, A-1400 Austria

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Corresponding author:  
Oleg Belyakov  
Email:  
o.belyakov@iaea.org

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### SUMMARY

**Introduction** IAEA program on radiation and tissue banking is a major effort to establish and improve tissue banks in Member States (MS). It was originated in 1971 and became supported by IAEA's Department of Technical Cooperation (TC) in 1982. Less known is that, apart from capacity building by the TC, Department of Nuclear Sciences and Applications carried out research projects related to tissue sterilisation. These two directions of work reinforce each other. **Materials and methods** IAEA Coordinated Research Project (CRP) E31006 on "Safety and optimisation of radiation sterilization in tissue banking: Studies on functional properties of irradiated tissue grafts" was started in 2010 and completed in 2015. 16 participating institutions from 15 MSs participated in the project. **Results and Discussion** Five main categories of research topics were studied: Bone, Demineralized bone, Cartilage allograft, Skin and Amnion. The use of tissue allografts in surgical procedures has increased tremendously over the last two decades. Radiation has been used to sterilize tissue allografts on a large scale. Controversies exist regarding the optimal dosage required since radiation may also compromise tissue allograft integrity and/or its biological function. Tissue banks use radiation doses just based on empirical and/or historical data, or use a fixed dose of 15 or 25 kGy for all tissue allografts. Moreover, radiation conditions differ very strongly from institute to institute which may strongly influence the efficacy of the radiation treatment. In order to improve the knowledge on radiosterilization of tissue allografts "new" and additional studies were designed and conducted under controlled and validated conditions. This "new knowledge" will lead to an optimization of the radiation sterilization process/procedures. **Conclusion** It can be concluded that since 2010 significant progress has been made by the participating tissue banks/institutes leading to the production of safer allografts both with respect to its functionality and sterility.

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