Teaching Session 3
Dosimetry + Translational Molecular Imaging & Therapy + Radiation Protection Committee
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Session Title
Radiobiology as a Missing Link in Improving and Understanding Nuclear Medicine

Chairperson
Uta Eberlein (Würzburg, Germany)

Programme
00:00 - 00:21 min Samantha Terry, (London, United Kingdom) Radiobiology in Nuclear Medicine
00:21 - 00:42 min Mark Konijnenberg, (Rotterdam, Netherlands): Why We Cannot Rely on EBRT Radiobiology
00:42 - 01:03 min Katharina Lückerath (Essen, Germany): Need for Radiobiology in Preclinical Research
01:03 - 01:24 min Roland Hustinx (Liège, Belgium): Need for Radiobiology in the Clinic
01:24 - 01:30 min Session Summary by Chairperson

Educational Objectives
1. Teach basics in radiobiology and its link to nuclear medicine
2. Importance of preclinical research and its use of radiobiology
3. Understand the importance of the use of biomarkers for better patient selection and follow-up/treatment planning

Summary
For radionuclide therapies, radiobiology is getting more and more important as a tool to support the efficacy and safety of the treatment. Extrapolation from radiobiology of external beam radiotherapy to radionuclide therapy is not straightforward due to differences in dose rate and the continuous internal irradiation with changing dose rates (varying heterogeneity of dose delivery) versus the external irradiation. There is a clear need to develop a better understanding of the radiobiological basis of therapeutic and cytotoxic responses during and after radionuclide therapy in tumours and normal tissues. Especially in this field a strong interaction and collaboration between radiochemists, radiopharmacists, radiobiologists, medical physicists, and physicians is needed. Consequently, teaching of those groups is of utmost importance. This session focuses on radiobiology, but it will bridge the gap to the clinics and its applications in nuclear medicine.

Following this session participants will understand the basic concepts and models of radiobiology, will know why dose limits of EBRT are not directly applicable in nuclear medicine and in which way the growing radiobiological knowledge will influence the clinical application of radionuclide therapies in the future.

Key Words
Radiobiology, Radionuclide Therapy, Biomarkers