AGA 5: Effects of Radiation

Time: Thursday 15:00–16:00 Location: PTB HS HvHB

Invited Talk AGA 5.1 Thu 15:00 PTB HS HvHB

Gender- and age-specific characteristics in radiosensitivity and their consequences for radiation protection - Overview of the current knowledge — •Lisa Deloch[1,2], Lena Winterling[1,2], Laura Ruspeckhofer[1,2], Tom Unterleiter[1,2], Michael Rückert[1,2], Thomas Weissmann[1], Antonia Völlings[1,2], Eva Titova[1,2], Rainer Fietkau[1], Udo S. Gaipl[1,2], and Margaux Piltz[1,2] — [1]Department of Radiation Oncology, Uniklinikum Erlangen, Friedrich-Alexander- Universität Erlangen-Nürnberg, Germany — [2]Translational Radiobiology, Department of Radiation Oncology, Uniklinikum Erlangen, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

The main aim of radiation protection is to keep the population from damage caused by ionizing and non-ionizing radiation, whereby deterministic damage should be prevented and stochastic risks should be reduced to a minimum. Biological research relevant to radiation protection has so far mostly focused on DNA as the most radiation-sensitive component of the cell. Nevertheless, a paradigm shift has become noticeable in recent years, which not only places direct, DNA-mediated effects at the center of research, but also focuses on systemic, immune-mediated effects that also occur after exposure to radiation. Additionally, age and gender have also an impact on the immune system, a rather basic but crucial factor that has been widely neglected in research. Some of these gender-specific influences are also known for radiation exposure, where women have shown to exploit a two-fold increased risk for solid tumors than men after exposition to radiation. Similar, preclinical studies revealed gender-specific differences in DNA-mediated radiation response. A more detailed understanding of the molecular mechanisms is thus required to define more specific threshold values in radiation protection issues but also in therapeutic approaches, disarmament and dismantling processes. As these important questions have not yet been systematically investigated, our NukSiFutur workgroup is focusing on answering the influence of age and gender on radiation responses in an osteo-immunological setting.