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## Analyses of CT induced DNA damage to determine radiation sensitivity of different age groups, especially young children –a pilot study in the frame of the EU EPI –CT project

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The increasing use of paediatric computed tomography (CT) worldwide has raised the question of possible late effects from exposure to ionising radiation. The European collaborative EPI-CT project aims at studying the cancer risks and the underlying biological effects in an international cohort study. The project is coordinated by the Section of Environment and Radiation at the International Agency for Research on Cancer (IARC). Eighteen centres from Belgium, Denmark, Germany, Finland, France, Luxemburg, the Netherlands, Norway, Spain, Sweden and the United Kingdom are cooperating in this project to enrol approximately one million patients. The overall objective is to inform about dose reduction and optimisation in paediatric CT.

The aim of the biological part of the study is to compare different biomarkers for radiation exposure and to test their sensitivity in clarifying the biological mechanisms behind low dose hypersensitivity observed in CT examined paediatric patients. The work is divided into a number of distinct and complementary tasks which will allow to study the effects of CT exposure using a variety of approaches, including assessment of DNA damage, mainly through monitoring chromosomal aberrations and  $\gamma$  H2AX foci.

In this context, an in vitro feasibility study to investigate age-dependent radiosensitivity is conducted at the BFS in Germany. Blood samples from three different age groups ranging from newborns (umbilical cord blood), young children (2 –5 years) to adolescents (>18 years) are being collected and investigated for different radiation-induced DNA damage parameters. Blood samples are being irradiated in a CT scanner. Chromosomal aberrations as well as the induction and repair of DNA double strand breaks have been investigated using  $\gamma$  H2AX foci analyses for two different age groups (adults and umbilical cord blood). Preliminary results will be presented at the ERR meeting. Final results of this pilot study will be used for evaluating the feasibility of conducting a larger study allowing sufficient statistical power for estimation of age- and sex-dependent radiosensitivity.

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**Primary author:** Mrs OESTREICHER, Ursula (Bundesamt für Strahlenschutz)

**Co-authors:** Dr KESMIENE, Ausrele (International Agency for Research on cancer IARC, France); Dr LINDHOLM, Carita (Radiation and Nuclear Safety Authority, Finland); Dr HÜBENER, Christoph (LMU, Klinik und Poliklinik für Frauenheilkunde und Geburtshilfe, Germany); Prof. BELKA, Claus (LMU, Klinik und Poliklinik für Strahlentherapie und Radioonkologie, Germany); Dr KIRLUM, Hans - Joachim (Praxis für Kinderchirurgie, Germany); Mr NEUMAIER, Klement (LMU, Klinik und Poliklinik für Strahlentherapie und Radioonkologie, Germany); Dr GOMOLKA, Maria (Bundesamt für Strahlenschutz); Prof. KIECHLE, Marion (TUM, Klinikum Rechts der Isar, Frauenklinik, Germany); Dr NIEMEYER, Markus (TUM, Klinikum Rechts der Isar, Frauenklinik, Germany); Mr LANG, Peter (LMU, Klinik und Poliklinik für Strahlentherapie und Radioonkologie, Germany); Dr BAATOUT, Sarah (Belgian Nuclear Research Center, SCK-CEN, Belgium); Dr KULKA, Ulrike (Bundesamt für Strahlenschutz); Dr ROESSLER, Ute (Bundesamt für Strahlenschutz); Dr HASBARGEN, Uwe (LMU, Klinik und Poliklinik für Frauenheilkunde und Geburtshilfe, Germany)

**Presenter:** Mrs OESTREICHER, Ursula (Bundesamt für Strahlenschutz)

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