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Sexual dimorphism in Cs137 accumulation after chronic low dose exposure in mice

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The presence of ¹³⁷Cesium (¹³⁷Cs) in the environment after nuclear accidents at Chernobyl and Fukushima Daiichi raises many health issues for the surrounding populations chronically exposed through the food chain. Unlike previous *in vivo* studies that focused solely on male exposures, this experimental research aims to assess the dosimetry and biodistribution of low-dose cesium contamination in both male and female C57bl6 mice. This study establishes a model for chronic ingestion of ¹³⁷Cs, simulating various exposure scenarios.

Male and female C57bl6 mice are exposed to concentrations resembling those ingested daily by residents in contaminated areas (20kBq/L), as well as 5- and 10-times higher concentrations to mimic potential cardiovascular damage-inducing levels. We subjected the animals to contaminations lasting either 2 or 6 months. Throughout this period, the animals were closely monitored to determine and quantify the absorbed doses by zooradiometry or measuring the concentration of Cs137 in different organs.

After 2 and 6 months exposure to chronic Cs137 in drinking water at 500kBq/L the absorbed dose is 1,6 times less in female mice compared to male mice. 40.02 mGy in female mice and 66.86 mGy in male mice after 2 months exposure. 187.7 mGy in female mice and 309.3 mGy in male mice after 6 months exposure. This dimorphism is also expressed in different organs and is highly expressed in skeletal muscle, heart and kidneys.

In this study we demonstrated a sexual dimorphism in cesium accumulation in total body and across different organs. This disparity is primarily attributed to higher cesium excretion via urine in females.