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## The biological response of human skin tissue to low dose ionizing radiation - from a metabolomic perspective

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Understanding how human organs respond to ionizing radiation (IR) at a systems biology level and identifying biomarkers for IR exp.physiological responses to low dose IR at the metabolite level, which represents the end-point of biochemical processes inside cells. Using a full thickness human skin tissue model and GC-MS-based metabolomic analysis, we examined the metabolic perturbations at three time points (3, 24 and 48 h) after exposure to 3, 10 and 200 cGy of X-rays. PLS-DA score plots revealed dose- and time-dependent clustering between sham and irradiated groups. Importantly, delayed metabolic responses were observed at low dose IR. When compared with the high dose at 200 cGy, a comparable number of significantly changed metabolites were detected 48 h after exposure to low doses (3 and 10 cGy) of irradiation. Biochemical pathway analysis showed perturbations to DNA/RNA damage and repair, lipid and energy metabolisms, even at low doses of IR.

### Biography

Dr. Zeping Hu is a research assistant professor in the Children Research Institute at the University of Texas Southwestern Medical Center at Dallas. He earned his Ph.D. from the National University of Singapore in Metabolomics and Pharmaceutical Sciences and received his post-doctoral training in the field of mass spectrometry and metabolomics with Dr. Richard Smith at Pacific Northwest National Laboratory. His research interest includes metabolomics, metabolic flux analysis, bioanalytical sciences (chromatography and mass spectrometry), drug metabolism and pharmacokinetics, and drug-drug/herb interactions. He is current focusing on the metabolomics (global profiling and targeted analysis) and metabolic flux analysis in stem cells, cancer cells and tissues to address important metabolic questions in stem cell and cancer biology. He is also interested in absolute quantitation of a variety of small handful of metabolites to better understand the target metabolic pathways. The goals of these studies are to understand the metabolic perturbations of stem cells and cancers and to discover diagnostic marker metabolites and novel therapeutic targets. Dr. Hu is the author of ~30 publications and reviewer of over 30 scientific journals in the fields of pharmaceutical sciences, metabolomics and analytical chemistry. He is also on the editorial board of *Journal of Chromatography & Separation Techniques*.

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