Prediction of Total Body and Partial Body Exposures to Radiation Using Plasma Proteomic Expression Profiles

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There is a need to identify new biomarkers of radiation exposure both for use in development of biodosimetry blood diagnostics for radiation exposure and for clinical use as markers of radiation injury. As almost all exposures in the field are heterogeneous, determination of degree of exposure and which vital organs have been exposed will be essential for effective medical management. In the current study we sought to characterize novel proteomic biomarkers of radiation exposure and develop exposure and dose prediction algorithms for a variety of exposure paradigms to include uniform total body exposures, partial body exposure fractions, and organ specific partial body exposures to only the brain, only the gut and only the lung. Using a mouse model, blood samples were collected from each radiation exposure paradigm and analyzed by either singleplex ELISA or the highly multiplexed SomaLogic SomaScan 7K proteomics platform to identify novel proteomic biomarkers of radiation exposure and develop biodosimetry algorithms to predict radiation exposure, radiation dose and organ specific radiation exposures.