Gene copy number studies in archived and fresh mouse tissue samples

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Janus studies conducted at Argonne National Laboratory were one of the largest sets of radiobiological mouse studies ever conducted and included more than 49,000 mice. These animals were exposed to a variety of doses, dose rates and qualities of radiation and allowed to live until natural death from cancer or other causes. At that time, a set of tissues were collected from each mouse and preserved in paraffin. Tissue sections from archived samples were used for DNA isolation and quantitative real time PCR amplification that revealed variations in mitochondrial gene copy numbers in different tissues and samples. To corroborate these findings, newly irradiated mice have been tested for gene copy number variations and the corresponding RNA expression was matched with the observed gene copy number differences. Overlap between observed gene copy number differences and RNA expression supports validity of this approach. More importantly, variation of gene copy numbers in fresh tissues follows a pattern recognizable in DNA samples from archived tissues.

This work was supported by United States Department of Energy grants DE-FG02-04ER63920, 05ER64086, DE-FG02-05ER64100, ER64342, and ER64815.