

## **Re-examining the role of tissue inflammation in radiation carcinogenesis: a hypothesis to explain an earlier onset of cancer**

For some time, radiation has been believed to affect only some, not all, individuals in an exposed population. However, that hypothesis does not explain the fact that the entire mouse survival curve<sup>1</sup> shifts in unison to show a shorter lifespan when mice are irradiated. For that reason, this uniform change should be considered the result of radiation's uniform effects on all exposed individuals.

In this paper, RERF scientists have considered that radiation-induced stromal<sup>2</sup> inflammation is likely the cause of the aforementioned comprehensive change in the survival curve. Radiation not only damages DNA but also causes cell death, leading to the release of a variety of inflammatory substances from damaged cells and the attraction of inflammatory cells to the stroma. Tissue in which inflammation is generated by radiation appears to promote increased proliferation (growth) of experimentally transplanted tumor cells. Such a favorable tissue environment for tumor cell growth can be spontaneously generated by other causes besides radiation. Moreover, radiation-induced inflammation is thought to persist over the long term, which is consistent with epidemiological data showing that an increased risk of radiation-related cancers persists over the lifetime of the organism.

If this new hypothesis about a possible link between radiation-induced inflammation and cancer risk is correct, the paper suggests that management of such stromal inflammatory processes with medicines might be able to delay the development of radiation-related cancers, in other words, reduce cancer risk.

### Notes

<sup>1</sup>Survival curve:

A graph showing the survival rates of a specific population.

<sup>2</sup>Stromal (adj); stroma (n):

Stroma are connective tissue such as blood vessels and nerves that support organs.

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RERF's objective with this brief outline is to succinctly explain our research for the lay public. Much of the technical content of the original paper has been omitted. For further details about the study, please refer to the full paper published by the journal.