

# What mechanisms mediate the health effects of ionising radiation?

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## Abstract

Ionising radiation is an inducer of mutations in genomic DNA and of the phenomenon of genomic instability. Conditions, epidemiologically associated with exposure to ionising radiation, including cancers, cataract of the eye, and circulatory disease, exhibit both mutations and genomic instability in the affected tissues. In general, affected tissues of exposed individuals give no reliable indication (biomarker) of radiation causation. Neither is it clear whether the condition is underlain by mutation or genomic instability. Nevertheless, in terms of research, prevention (radiological protection) and treatment of radiation induced diseases, understanding the underlying mechanisms is important.

Following the Chernobyl accident, childhood thyroid cancer was a prominent early (within the first decade) consequence. Increased numbers of other solid cancers, blood cancers and circulatory disease are continuing to be reported, especially among clean-up workers. This paper explores the relevance of underlying mechanisms for studies of the consequences of the Chernobyl and Fukushima Daiichi accidents.