##### Biological and Physical Effects of Nuclear Radiation

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Abstract:

Humans have always been subjected to ionizing radiation – both natural and artificial. The biological damage produced by radiation occurs first at the chemical and biochemical level due to the disruption of some of the molecules within the cells of living matter. This disruption may be produced by direct cleavage of the parts of a molecule or by chemical attack by abnormally active chemical agents produced by the radiation. The most critical targets in the cell are the DNA molecules which are responsible for cellular development, function and division. Cellular damage is manifested in several ways: death of cells, failure to reproduces, and much more rarely, transformation of cells to new forms, some of which may eventually become malignant and initiate a cancer. We aim to provide an up-to-date review of the scientific background and current estimates of the potential risk of adverse effects of such exposures. We will also discuss the unavoidable exposures and ALARA principle, the biological and physical effects of radiation as well its deterministic and stochastic effects.