Ionizing Radiation Encyclopedia Article

Ionizing Radiation

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Ionizing Radiation

High-energy radiation with penetrating competence such as x rays and gamma rays which induces ionization in living material. Molecules are bound together with covalent bonds, and generally an even number of electrons binds the atoms together. However, high-energy penetrating radiation can fragment molecules resulting in atoms with unpaired electrons known as "free radicals." The ionized "free radicals" are exceptionally reactive, and their interaction with the macromolecules (DNA, RNA, and proteins) of living cells can, with high dosage, lead to cell death. Cell damage (or death) is a function of penetration ability, the kind of cell exposed, the length of exposure, and the total dose of ionizing radiation. Cells that are mitotically active and have a high oxygen content are most vulnerable to ionizing radiation.

See Also

Radiation Exposure; Radiation Sickness; Radioactivity