

RADIATION BIOLOGY

1. Cellular response to radiation.

Any damage to cellular DNA is responded to instantly by an assortment of biochemical pathways whose functions are to repair DNA lesions and minimize mutations. ... Upon exposure to radiation, cells normally react in three distinct ways: arrest cell cycle progression, repair DNA lesions, or trigger the apoptotic response.

2. How does the radiation affect the cells?

They have very high levels of chemical reactivity, and therefore generate indiscriminate chemical reactions. Radiation and electrons bombarded by radiation move haphazardly inside the cell, resulting in damage to the various molecules forming the cell. Chromosomal DNA inside the cell nucleus can also be damaged.

3. How does the body respond to radiation.

Ionizing radiation—the kind that minerals, atom bombs and nuclear reactors emit—does one main thing to the human body: it weakens and breaks up DNA, either damaging cells enough to kill them or causing them to mutate in ways that may eventually lead to cancer.

4. How does radiation affect mitosis?

Radiation in sufficient doses can inhibit mitosis, that is, the cell's ability to divide and proliferate indefinitely. The inhibition of cellular proliferation is the mechanism by which radiation kills most mammalian cells.

5. Direct and indirect effect.

Radiation damage to the cell can be caused by the direct or indirect action of radiation on the DNA molecules. In the direct action, the radiation hits the DNA molecule directly, disrupting the molecular structure. Such structural change leads to cell damage or even cell death.

6. Why radiation harmful to cells?

Ionizing radiation can affect the atoms in living things, so it poses a health risk by damaging tissue and DNA in genes. has sufficient energy to affect the atoms in living cells and thereby damage their genetic material (DNA). Fortunately, the cells in our bodies are extremely efficient at repairing this damage.

7. How do you detox from radiation?

Sulphur containing foods – such as Fish, Eggs, Beans and Peas, Brussels Sprouts, Onions, Cabbage, Garlic and Wheat Germ have been found to protect the body against radiation. High pectin foods – like carrots, sunflower seeds and apples have been shown to help keep pollutants from being assimilated.

8. Radiolysis of water.

Water radiolysis is the decomposition of water molecules due to ionizing radiation. Usually, this ionizing radiation stems from the decay of radioactive

RADIATION BIOLOGY

nuclei, beams of accelerated charged particles (electrons, protons...) and from X-ray radiation (with a photon energy greater than 50–100 eV).

9. Radiolysis.

Radiolysis is the dissociation of molecules by ionizing radiation. ... For example, water dissociates under alpha radiation into a hydrogen radical and a hydroxyl radical, unlike ionization of water which produces a hydrogen ion and a hydroxide ion.

Water decomposition · Applications · Hydrogen production · **Radiation therapy.**

10. What happens when water is irradiated?

When exposed to radiation, water undergoes a breakdown sequence into hydrogen peroxide, hydrogen radicals, and assorted oxygen compounds, such as ozone, which when converted back into oxygen releases great amounts of energy. Some of these are explosive.

12. What is a radiolytic product?

As ionising radiation passes through food, it creates a trail of chemical transformations by primary and secondary radiolysis effects. The main reported radiolytic products are certain hydrocarbons and 2-alkylcyclobutanones produced from the major fatty acids in food, and some cholesterol oxides and furans.

13. What is G value in radiation chemistry?

The G value refers to the number of molecules of reactant consumed or product formed per 100 eV of energy absorbed. Although ubiquitous in radiation chemistry, the G-value concept appears only rarely in plasma chemistry.

14. What is water radiolysis?

Water radiolysis is the decomposition of water molecules due to ionizing radiation. Usually, this ionizing radiation stems from the decay of radioactive nuclei, beams of accelerated charged particles (electrons, protons...) and from X-ray radiation (with a photon energy greater than 50–100 eV).

15. What irradiation means?

RADIATION BIOLOGY

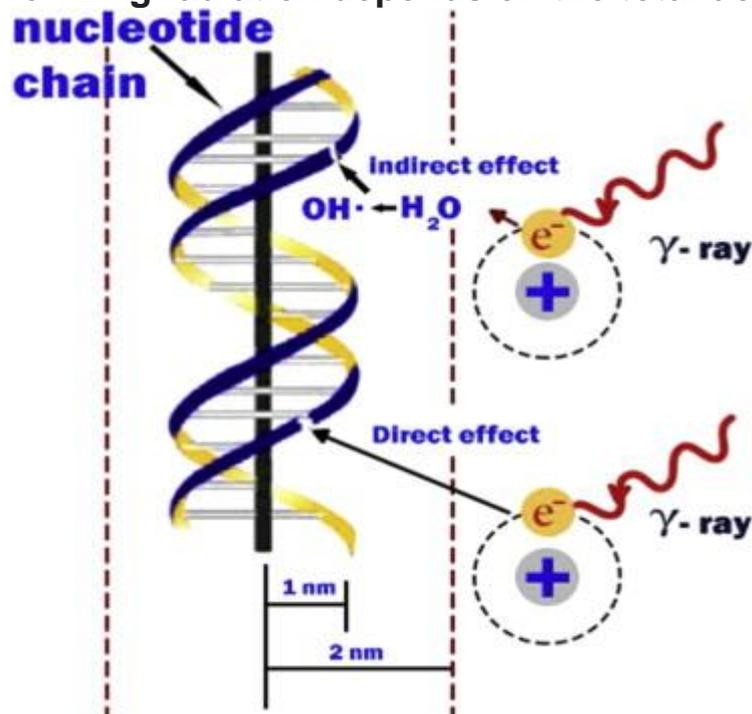
exposure to radiation

1 : exposure to radiation (such as X-rays or alpha particles)

2 : the application of radiation (such as X-rays or gamma rays) for therapeutic purposes or for sterilization (as of food) also : partial or complete sterilization by irradiation.

16. What is indirect and direct action?

In the direct action, the radiation hits the DNA molecule directly, disrupting the molecular structure. ... The result of indirect action of radiation on DNA molecules is the impairment of function or death of the cell. The number of free radicals produced by ionizing radiation depends on the total dose.



17. What is the difference between direct and indirect radiation?

If the absorption of radiation occurs in the molecule in which the lesion appears, then this is the direct action of radiation, while with indirect action the absorption of the radiation energy and the response to this energy occur in different molecules.

18. Time scale of radiation effects.

RADIATION BIOLOGY

The time scale of radiation action spans at least twenty-six orders of magnitude extending from the earliest physical events following transit of a fast particle or quantum through a small atom, to the late genetic and carcinogenic effects of radiation which may not manifest themselves until decades after irradiation.

19. How does radiation affect human body?

Exposure to very high levels of radiation, such as being close to an atomic blast, can cause acute health effects such as skin burns and acute radiation syndrome ("radiation sickness"). It can also result in long-term health effects such as cancer and cardiovascular disease.

20. Does radiation cause virus?

Exposure to UV radiation is recognized to suppress cell-mediated immunity and therefore could adversely affect the course of a viral infection.

21. Which organs are more sensitive in radiation?

As noted previously, the most sensitive organs are the blood forming organs and the gastrointestinal system. The biological effects on the whole body from exposure to radiation will depend upon several factors.

22. What is the first sign of too much radiation?

The initial signs and symptoms of treatable radiation sickness are usually nausea and vomiting. The amount of time between exposure and when these symptoms develop is a clue to how much radiation a person has absorbed.

23. What organs are affected by radiation?

Let's do a head-to-toe walk-through to investigate how high doses of radiation can damage the human body.

- **Brain.** Nerve cells (neurons) and brain blood vessels can die, leading to seizures.
- **Eyes.** Radiation exposure increases the risk of cataracts.
- **Thyroid.** ...
- **Lungs.** ...

RADIATION BIOLOGY

- Heart. ...
- GI tract. ...
- Reproductive organs. ...
- Skin.

***** ALL ARE FROM WIKIPIDIA.