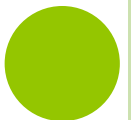


Radiation Pollution

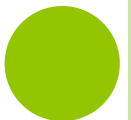


Dr. Areej Ahmed / Oral diagnosis Department



CONTENT

- What is Radioactive Pollution?
- Types
- Sources
- Effects
- Prevention
- Conclusion



WHAT IS RADIOACTIVE POLLUTION?

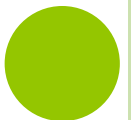
- Addition of radiation to environment by using radioactive elements .
- Radioactive pollution, like any other kind of pollution, is the **release of something Unwanted into the environment** and, in this case, the unwanted thing is radioactive material.



SAVE THE PLANET



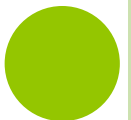
- Radioactivity is a natural phenomenon.
- It occurs when overly **excited atoms seek stability** by emitting energy in the form of radiation.
- The amount of **energy and the forms** of radiation emitted vary radioactive elements.
- It is due to this variation that the uses of radiation range from powerful tracers of biological, physiological, and geological cycles; to healing medicine; to weapons of mass destruction.



- The process of radioactive decay **transforms one element into another.**
- There are long chains of naturally occurring transformations .

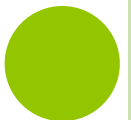


- At each step the resulting product loses all the **characteristics** .
- Characteristics such as color, melting point, hardness, even physical state change with each transformation.
- For example, within the **U-decay series**.

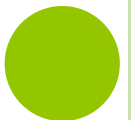


- Radioactive contamination .

- Such contamination presents a hazard .

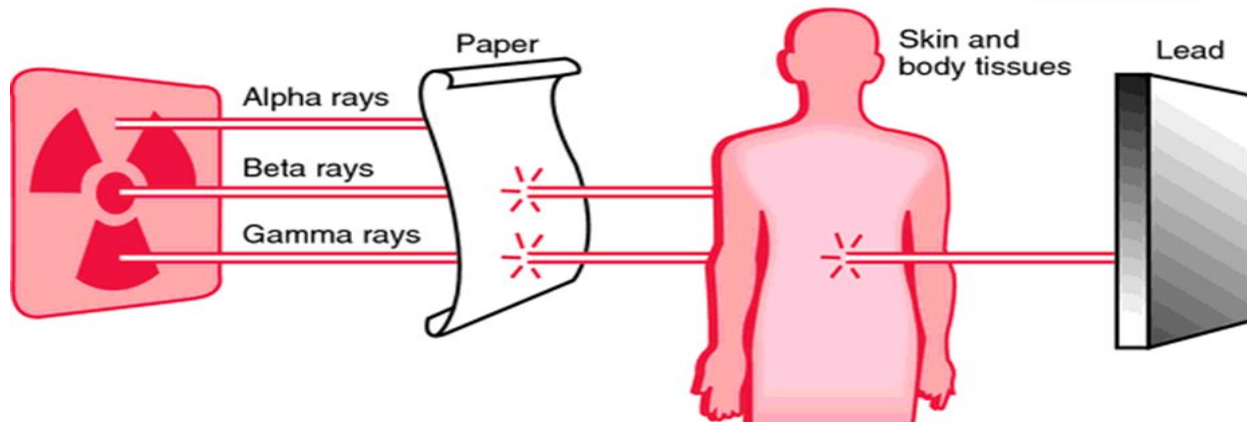
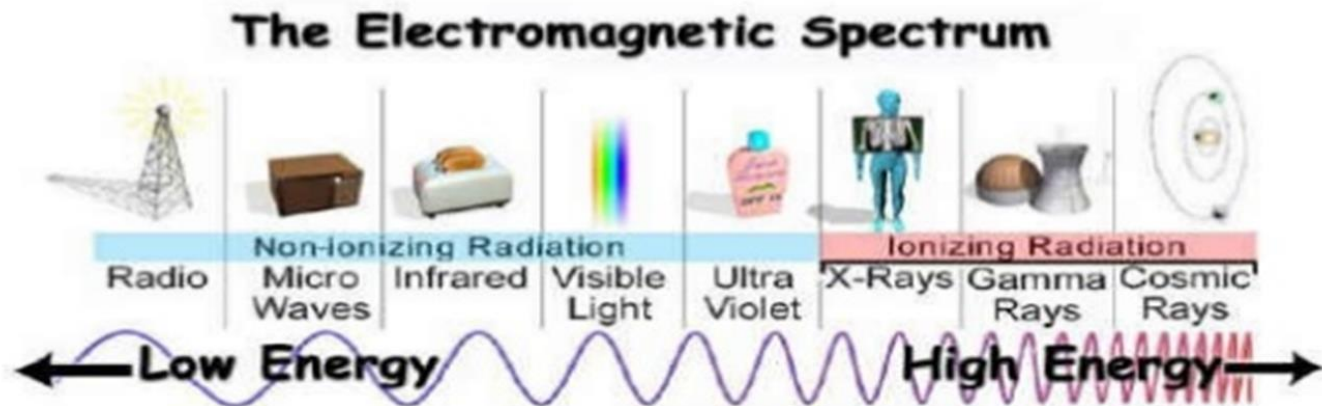


- The degree of hazard is determined by:
 1. the **concentration** of the contaminants
 2. the **energy** of the radiation being emitted
 3. the **type** of radiation
 4. the **proximity** of the contamination to organs of the body .
- Contamination may affect a person, a place, an animal, or an object such as clothing



TYPES OF RADIATIONS

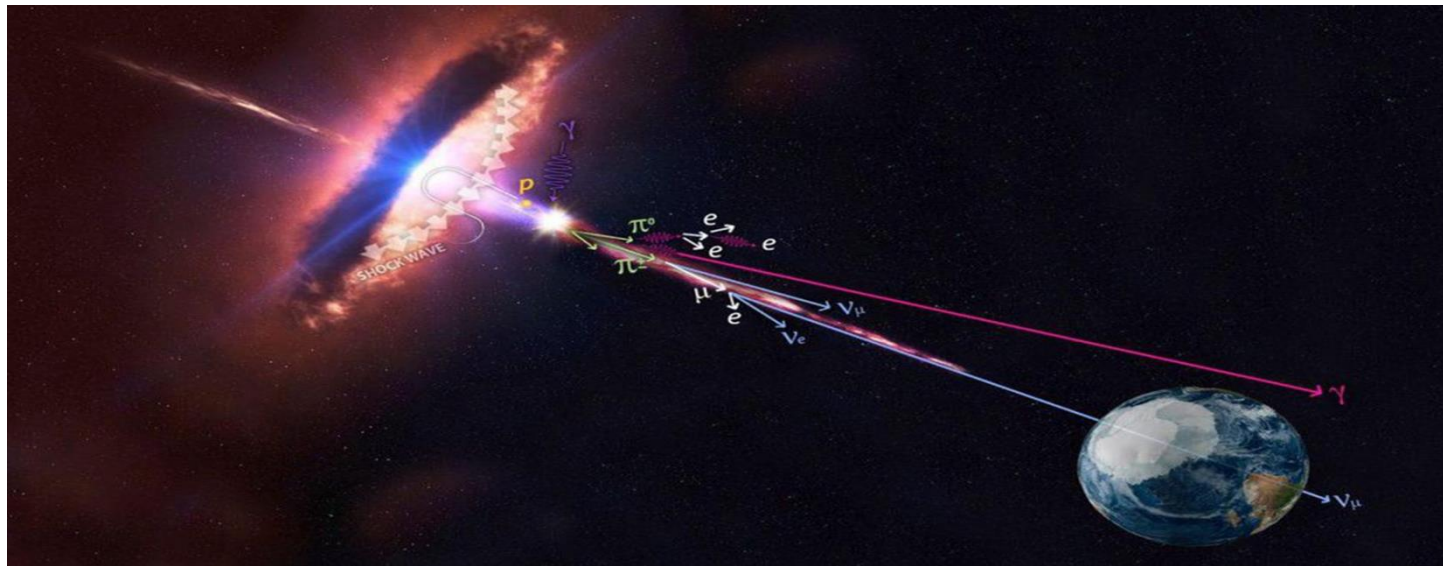
- Non-ionizing radiations
- Ionizing radiations



SOURCES OF RADIOACTIVE POLLUTION

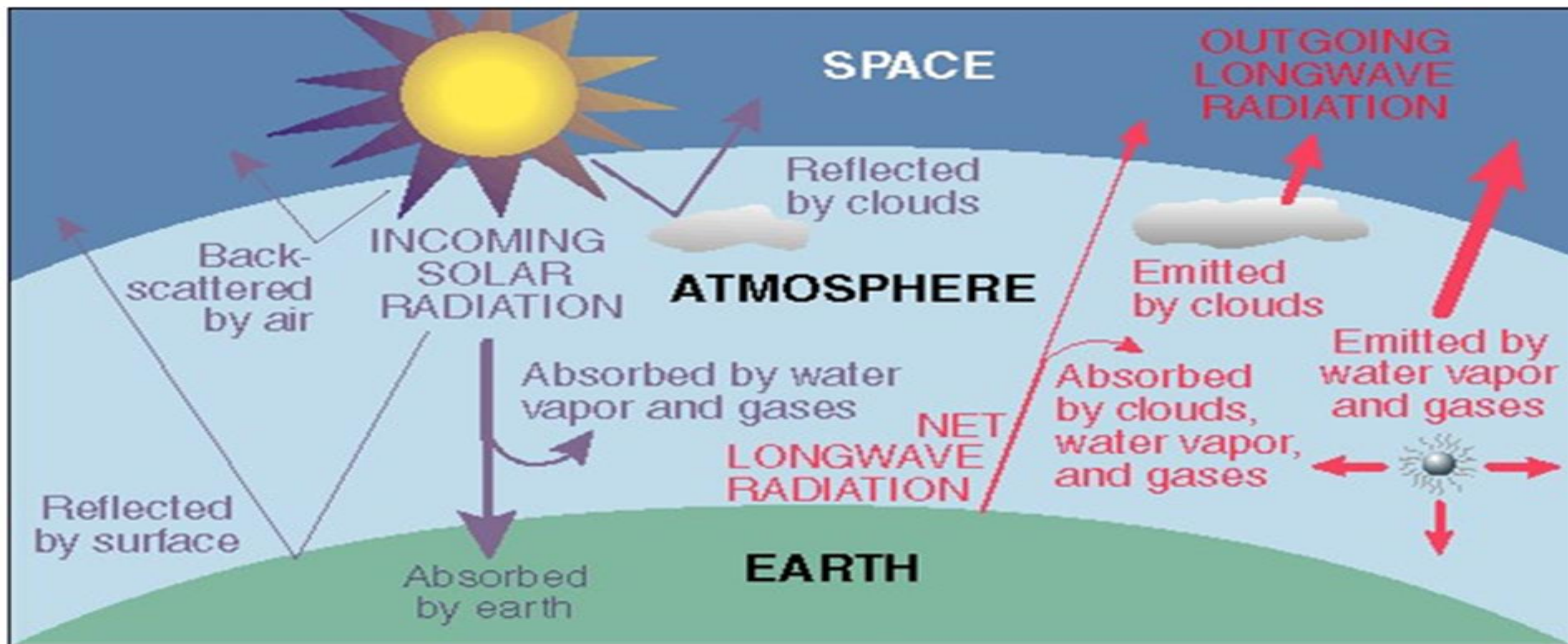
Natural sources of radiation:

- Cosmic rays:

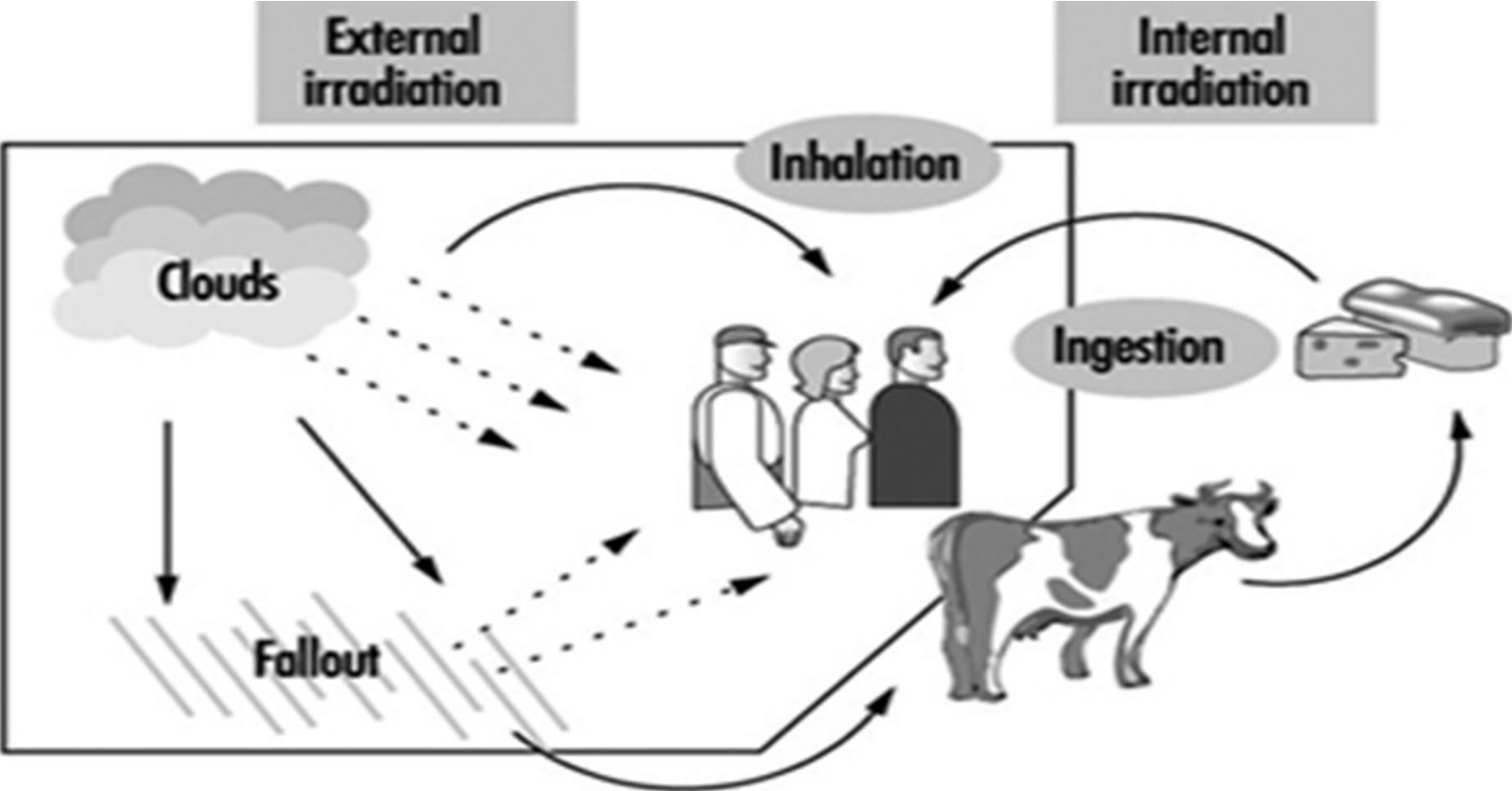


Environmental:

- Terrestrial radiation:
- Atmospheric radiation:

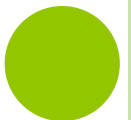


Internal radiation:



Anthropogenic sources of radiation: Human activities mentioned below include in sources of radioactive pollution:

- Nuclear tests
- Nuclear reactors
- Diagnostic medical applications
- Nuclear Wastes
- Nuclear explosions
- Nuclear metal processing

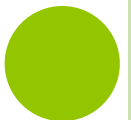


Man-made or artificial sources:

- X rays: Medical and dental X-ray.

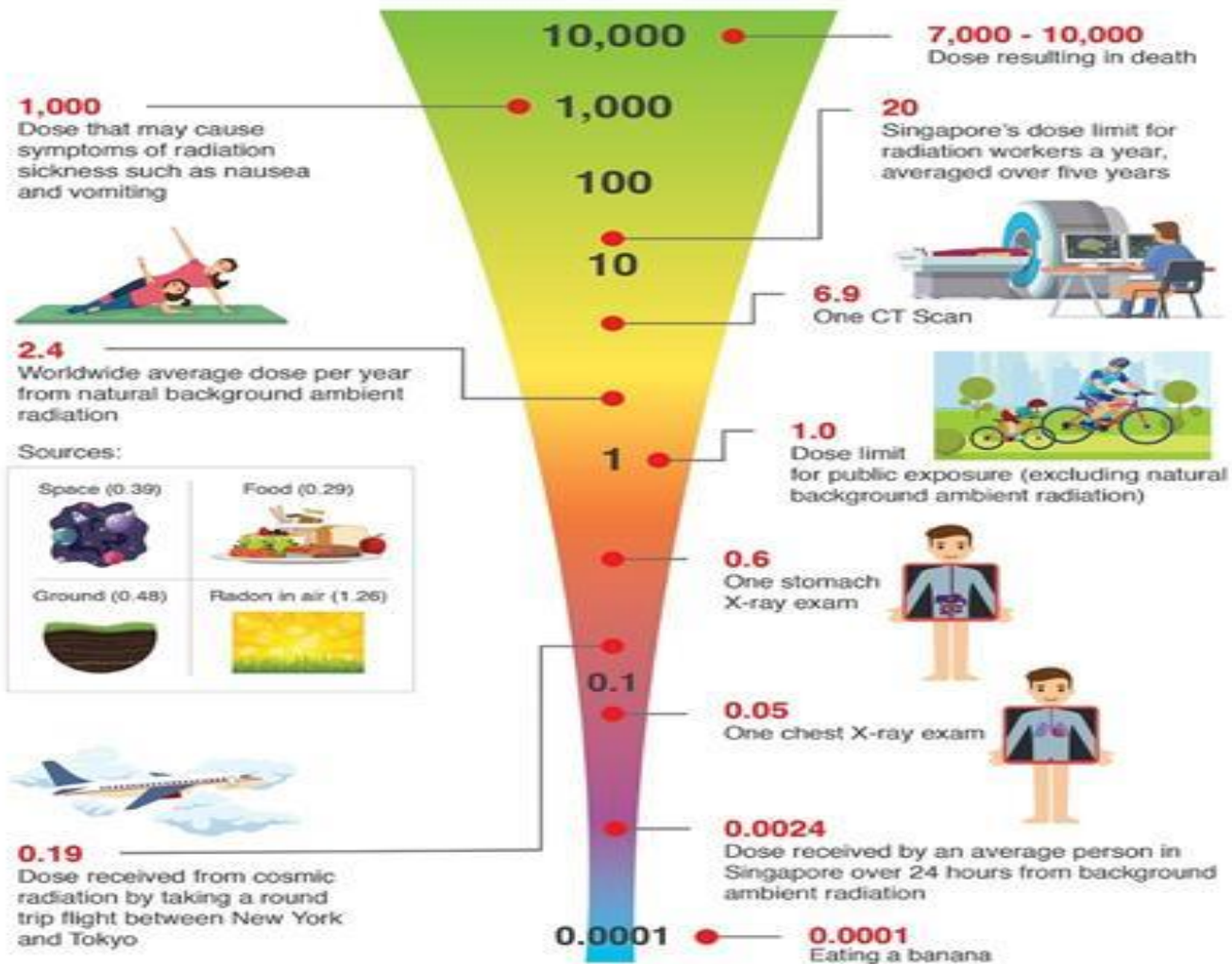


- **Miscellaneous:** some every day appliances such as TV set and luminous wrist watches are radioactive.



Effective Radiation Dose

(Unit: millisievert = mSv)



EFFECTS OF RADIOACTIVE POLLUTION

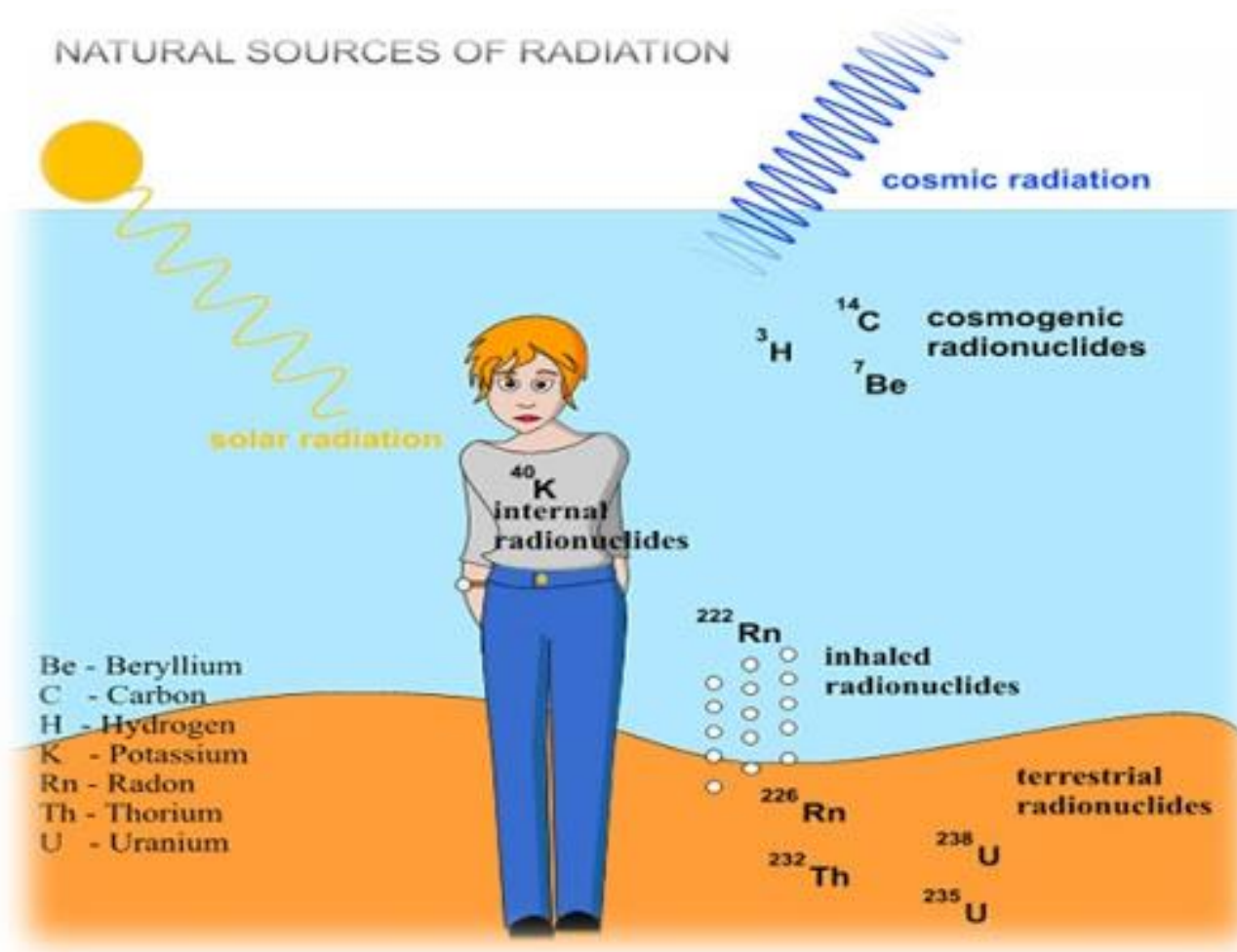
On Human Beings

- The impact of radioactive pollution on human beings can **vary from mild to fatal**
- Low levels of localized exposure
- Long-term exposure or exposure to high amounts of radiation
- Radioactive rays can cause irreparable damage to DNA



Effect of Radiation

- Effect on Human body



Interaction of radiation with matter

- The interaction of radiation with matter leads to the excitation and ionization of the target material (tissue).
- The **effects of dissipating radiation energy** in the target tissue include:
 - temperature increase
 - excitation and ionization of atoms
 - the breaking of chemical bonds
 - biological effects
- Ionizing radiation is characterized by a large release of energy



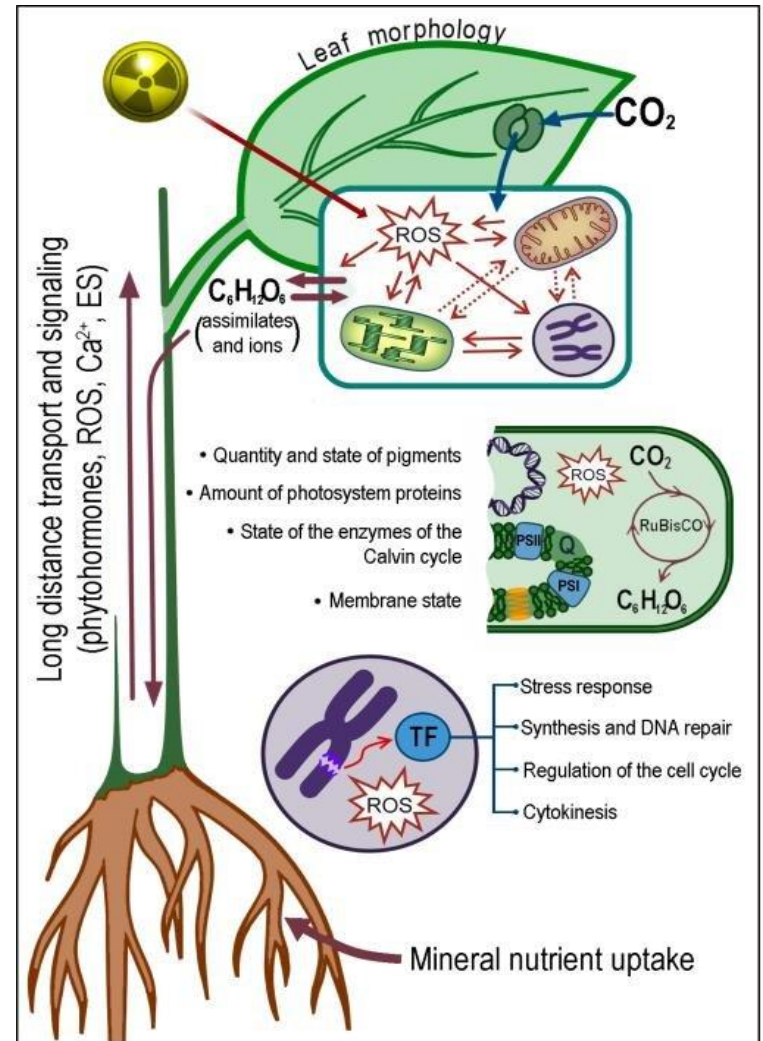
Dose (whole-body irradiation)	Effects
<0.25 Gy	No clinically recognizable damage
0.25 Gy	Decrease in white blood cells
0.5 Gy	Increasing destruction of leukocyte-forming organs (causing decreased resistance to infections)
1 Gy	Marked changes in the blood (decrease in the numbers of leukocytes and neutrophils)
2 Gy	Nausea and other symptoms
5 Gy	Damage to the gastrointestinal tract causing bleeding and ~50% death
10 Gy	Destruction of the neurological system and ~100% death within 24 h



Environmental radiological protection

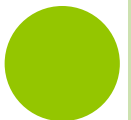
There are fundamental differences in determining the risk to humans following exposure to radiation and the risks to a radioactively contaminated environment. ecological risk to non-human biota is concerned with plants and animals.

Endpoints for ecological risks are not cancer oriented, but instead include a wide assortment of effects ranging from chromosomal damage to reduced reproductive success.



PREVENTION

- Nuclear devices
- Radio isotopes
- Industrial wastes
- Chimney and ventilations
- Nuclear reactors
- Fission reactions
- Nuclear medicines and radiation therapy





Indoor Plants Help in Absorbing Harmful Radiations



Conclusion

- Overall, nuclear energy has several risks for us and the next generations, and we are living with them and are responsible for them. None of the nuclear plants, wastes, or weapons will disappear in this world because they overwhelmingly need a long time to be safely disposed of, even if we can dispose of them, they are still around us, we just cannot see it.
- So, what we can do is to dwindle the usage of nuclear power for the future. The third nuclear plants(Chernobyl, Three Mile Island, Fukushima) disaster should be a turning point for us. It is not too late for us to change our goal, although we have a responsibility for nuclear power because we are using it.



SAVE the EARTH



Let's take care of the Earth for the future of our children!