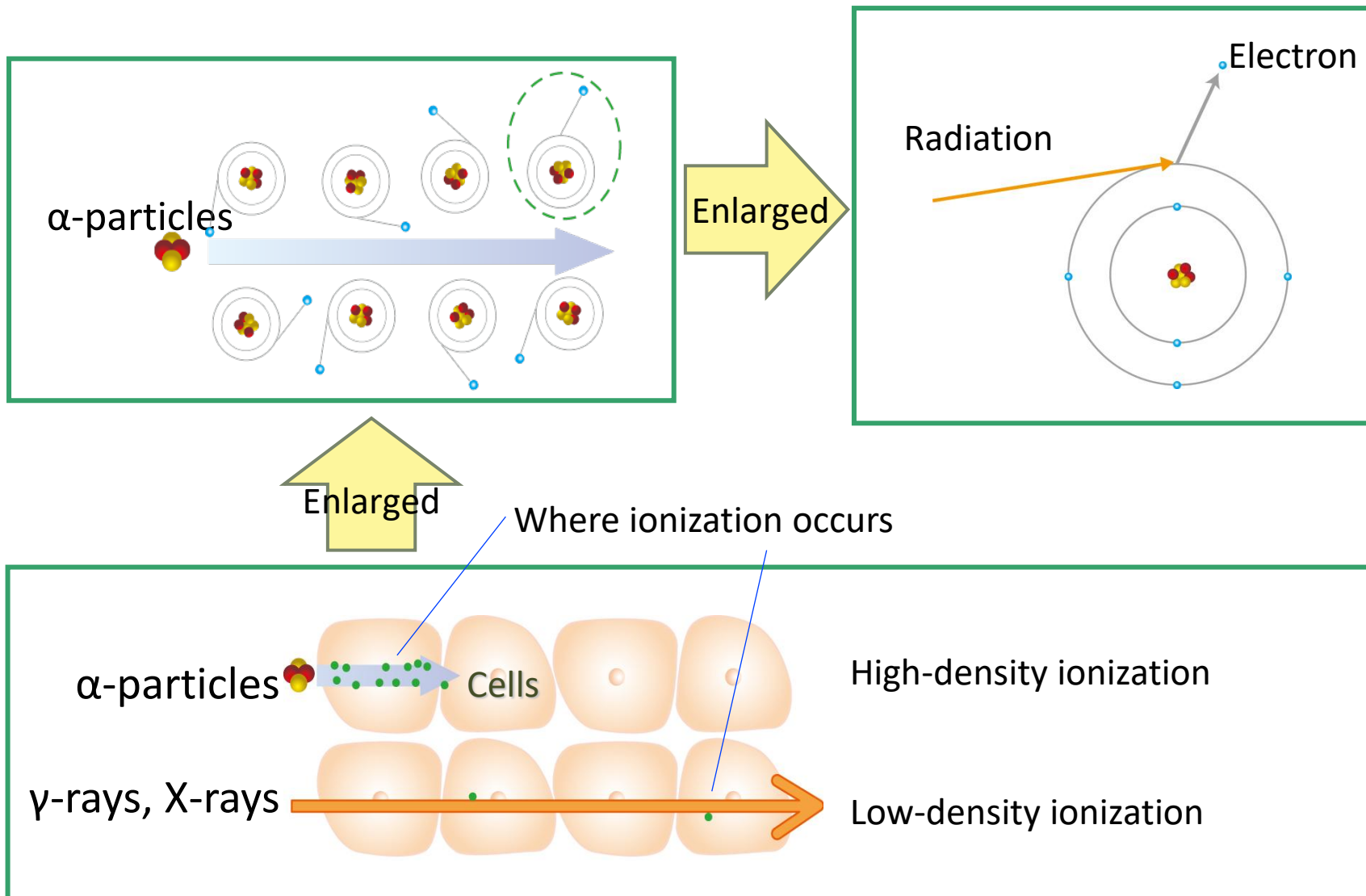
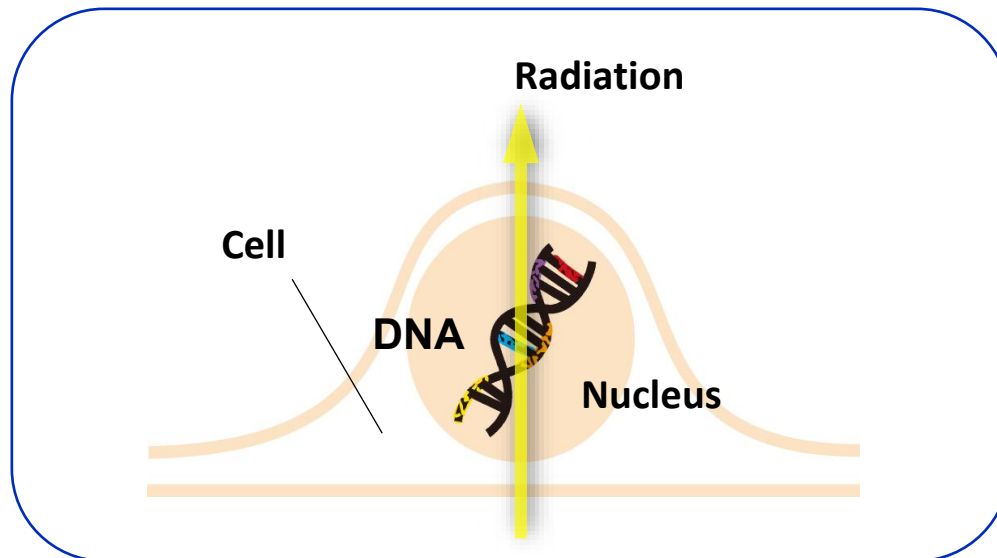


# Ionization due to Radiation



# Damage and Repair of DNA

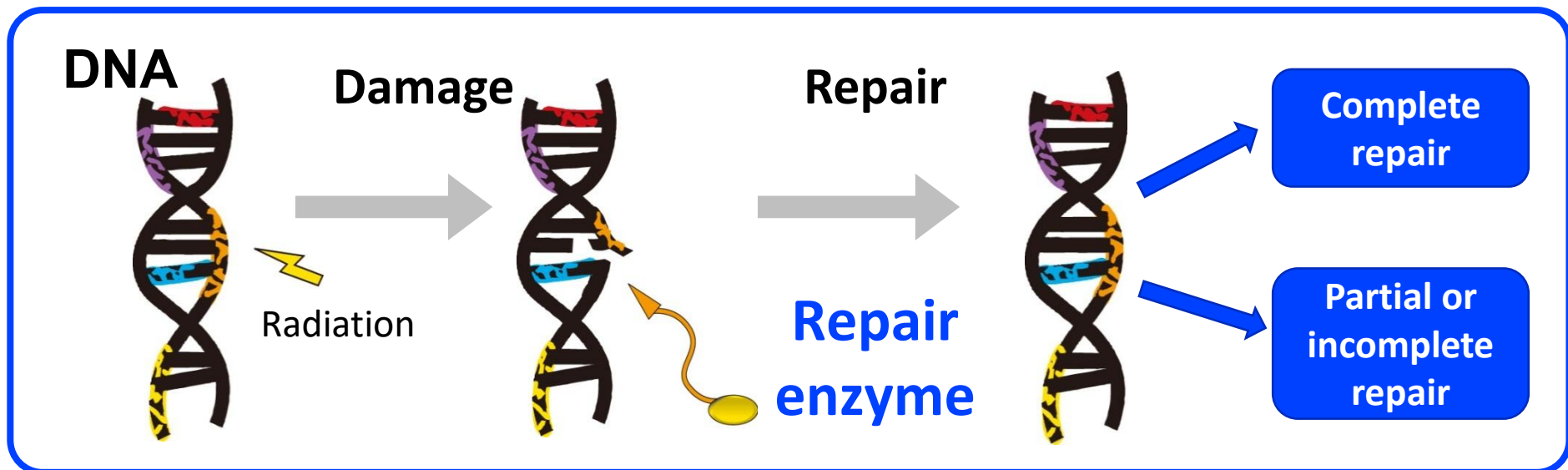


Damage per **1 mGy of X-rays**  
(per cell)

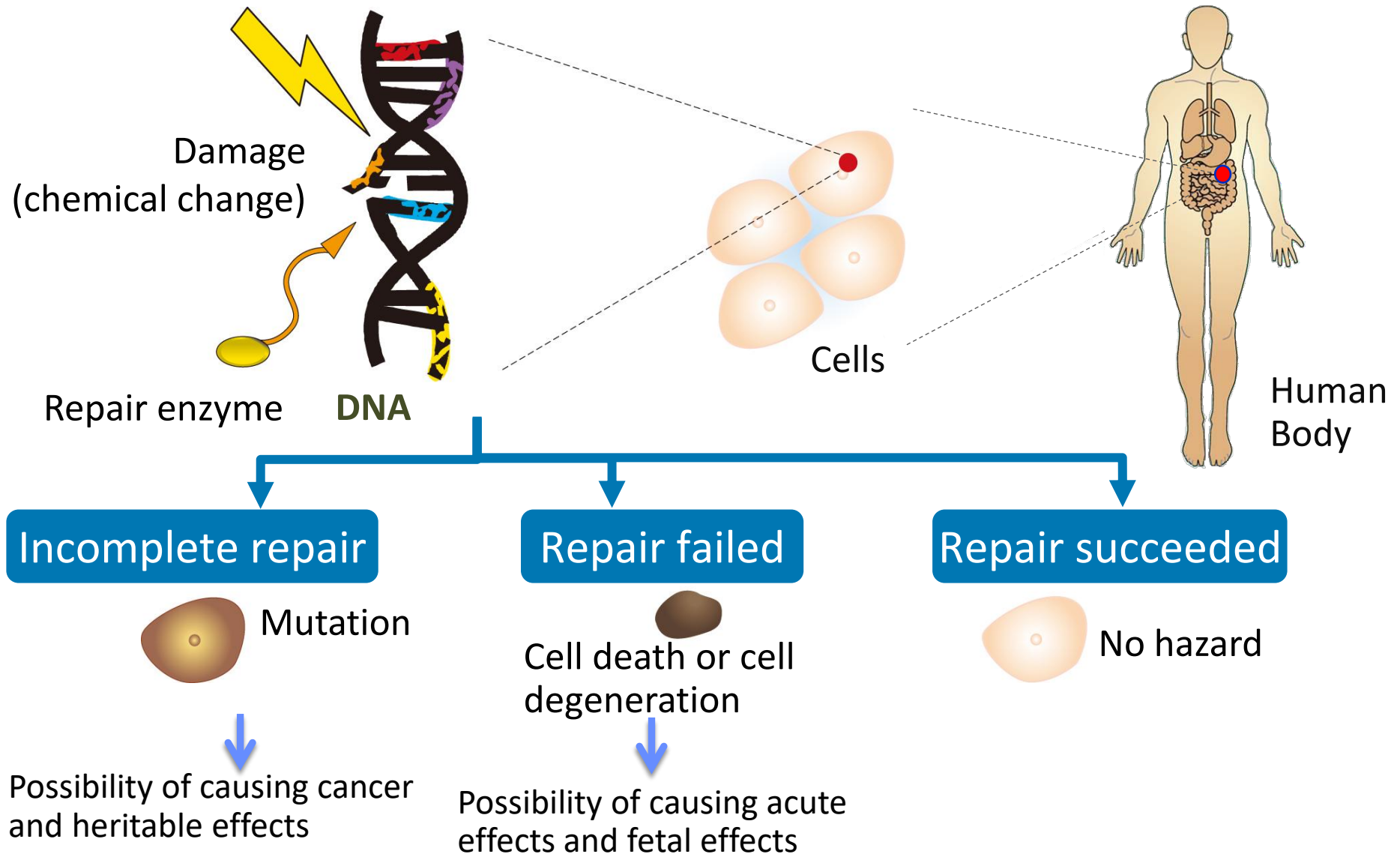
Base damage: 2.5 locations

Single-strand break: 1 location

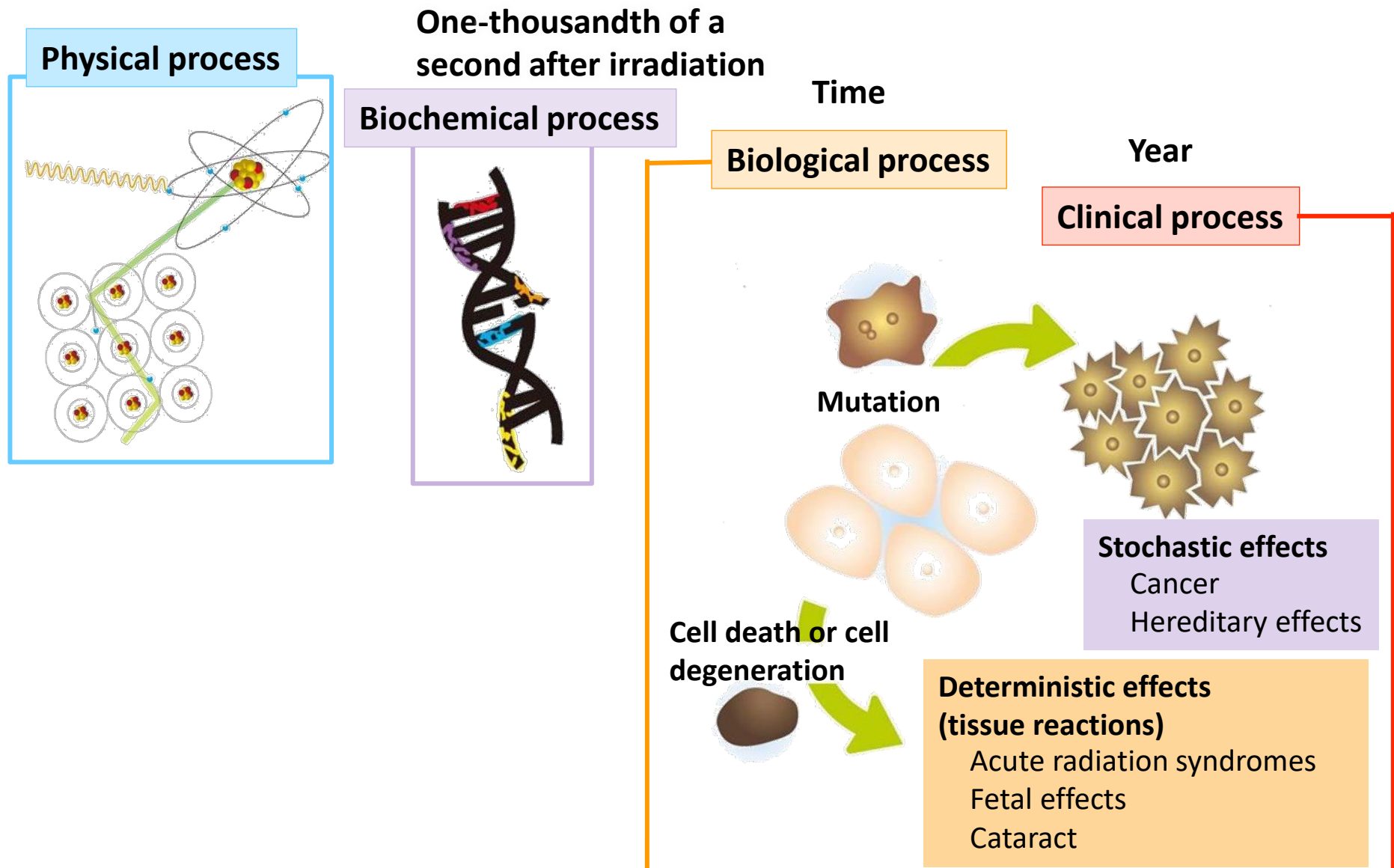
Double-strand breaks: 0.04 locations



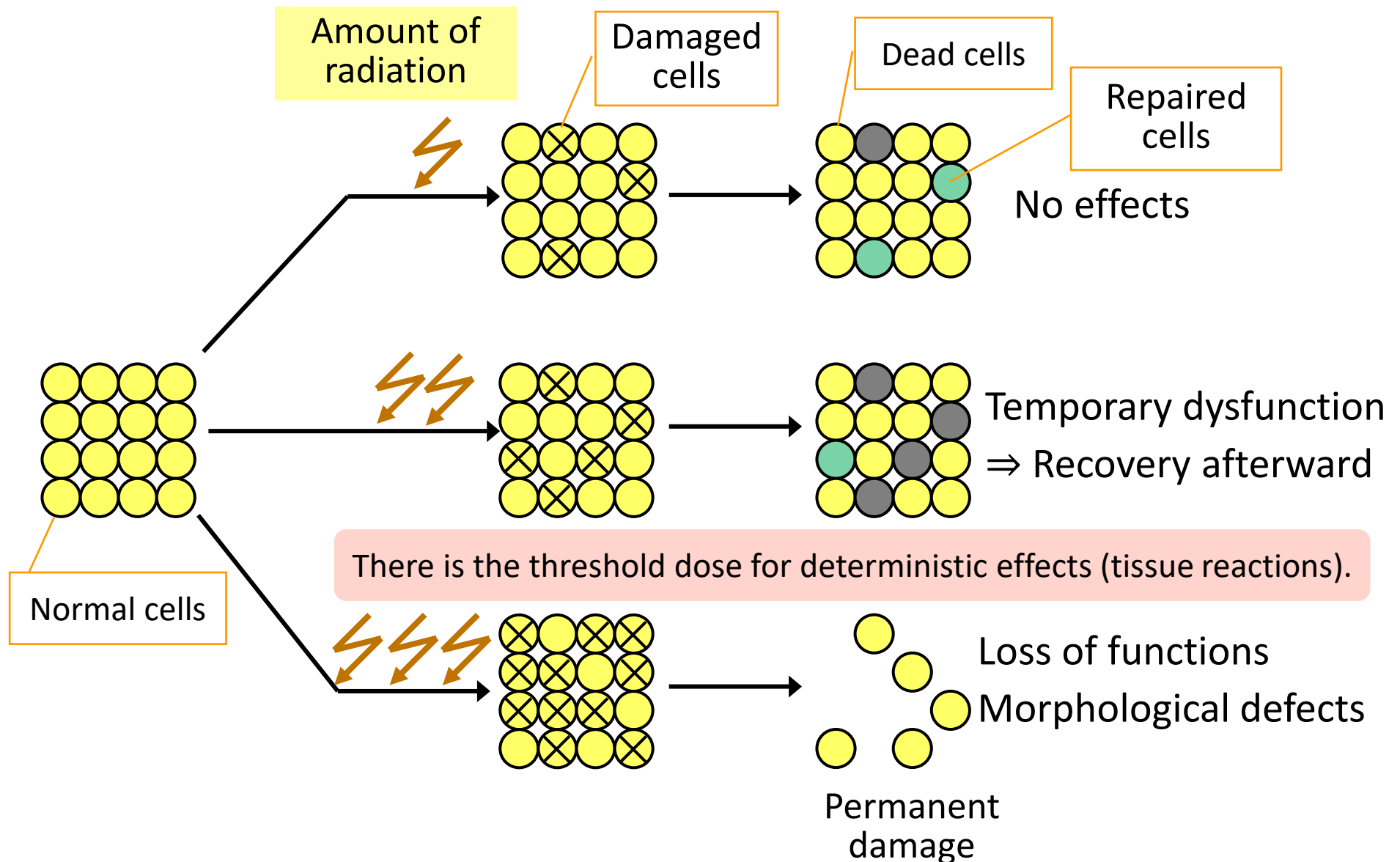
# DNA → Cells → Human Body



# Lapse of Time after Exposure and Effects



# Cell Deaths and Deterministic Effects (Tissue Reactions)



# Radiosensitivity of Organs and Tissues

Active cell division

High sensitivity

**Hematopoietic system:** Bone marrow and lymphatic tissues  
(spleen, thymus gland, lymph node)

**Reproductive system:** Testis and ovary

**Gastrointestinal system:** Mucous membrane and small-intestinal  
villus

**Epidermis and eyes:** Hair follicle, sweat gland, skin and lens

**Other:** Lung, kidney, liver and thyroid gland

**Support system:** Blood vessel, muscle and bone

**Transmission system:** Nerve

No cell division

Low sensitivity

# Cellular Mutation and Stochastic Effects

