

SUMMARY

The text summarizes some of the newest knowledge about effects of the ionizing radiation on various levels of the biological systems and recent recommendations for radiological protection. First chapter of this diploma work gives a brief definition of ionizing radiation, possible sources, summary of its interactions with matter and description of the dosimetric quantities. Second chapter focuses on biological effects of the ionizing radiation. With development of micro-beam technology, the newest research has finally confirmed the assumption of DNA as the main target cell structure for ionizing radiation damage. Apart from well known stochastic effects (cancerogenic and those, causing hereditary and chronic diseases) caused by non-lethal cell damage and organ and tissue reaction (formerly known as non-stochastic or deterministic effect, eg. acute radiation syndrome, acute local damage, chronic radiodermatitis and cataract) caused by lethal cell damage also issues like low dose threshold, in utero exposure risk and newest recommendations for weighting factors are discussed here. Last chapter is dedicated to targets and principles of radiological protection for patients, workers and other population.