

International School on Nuclear Methods for Environmental and Life Science



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RADIOBIOLOGICAL RESEARCH AT JINR ACCELERATORS AND MODELLING OF RADIATION-INDUCED DISORDERS IN CENTRAL NERVOUS SYSTEM

JINR accelerators provide extensive capacity for multifaceted radiobiological research concerning basic problems of radiation genetics, molecular radiobiology, and radiation physiology, as well as a wide spectrum of practical issues, the most challenging ones being space radiobiology with special reference to manned interplanetary missions and the use of charged particles for the treatment of malignant tumors. Possible acute and delayed risks to the central nervous system (CNS) are accepted now as the most concerning in these fields. The aim of this lecture is to explain approaches for solving the problem of radiation-induced disorders in CNS. Particular emphasis will be given on principal difference of biological action between low-linear energy transfer (LET) radiation (X rays or gamma-rays) and high LET radiation (protons and heavy charged ions). Current progress in the experimental physiological and molecular biological studies in conjunction with theoretical results obtained by computer modelling techniques will be reviewed.

Primary author: BUGAI, Alexandr (Joint Institute for Nuclear Research)

Presenter: BUGAI, Alexandr (Joint Institute for Nuclear Research)