EUROPEAN RADIATION RESEARCH 2012



Contribution ID: 45

Type: oral (travel award)

Infrared light induced the transgenerational genomic instability on mice

Thursday, 18 October 2012 14:00 (15 minutes)

In the last decade, the phenomenon of adaptive response (AR) has attracted considerable attention of investigators. It is considered as a form of cell defense from mutagenic action of different factors. Therefore the search for adaptogens of physical and chemical nature which are able to transform the organisms to a new adapted state similarly as low doses is an actual problem. Various devices, based on the action of electromagnetic waves of the infrared subspectrum are currently used in clinical practice.

Previously, in our experiments it was shown that exposure of mice to infrared light (IRL) as well as low doses of X- and γ -rays, induced AR in bone marrow cells, remained unchanged thymus weight after irradiation with a challenging dose (1.5 Gy) and decreased tumor growth rate. In the present work, we investigated the induction of AR in hemopoietic organs (bone marrow cells and thymus) and Ehrlich carcinoma growth rate on the mice offspring (F1, F2, F3) born from IRL (850 nm, 101 Hz, 22 mW/cm2) irradiated males.

To induce the AR the standard scheme of radiation (0.1 Gy + 1.5 Gy) was used. The level of cytogenetic damage was assessed in bone marrow cells using a micronucleus test. The weight of the thymus was determined from the ratio of the average weight of the organ to the average weight of animals in the group. The influence of the adaptive exposures on the tumor growth was estimated by measuring the size of the tumor at different times after the inoculation of ascitic cells into the femur.

Our investigation of three generations from males irradiated by IRL demonstrated that: the level of cytogenetic damages did not differ from that of unirradiated mice, the radiosensitivity decreased, the animals did not induce cytogenetic AR, the thymus weight decreased and the tumor growth rate did not differ from that of the offspring from unirradiated males.

The obtained experimental data demonstrated the induction of genomic instability on three generations of mice irradiated by infrared light.

Primary author: Mrs DYUKINA, Alsu (Institute of Theoretical and Experimental Biophysics of RAS)

Co-authors: Mrs ROZANOVA, Olga (Institute of Theoretical and Experimental Biophysics of RAS); Mr RO-MANCHENKO, Sergey (Institute of Theoretical and Experimental Biophysics of RAS); Mrs ZAICHKINA, Svetlana (Institute of Theoretical and Experimental Biophysics of RAS)

Presenter: Mrs DYUKINA, Alsu (Institute of Theoretical and Experimental Biophysics of RAS)

Session Classification: Awardees 2

Track Classification: Non-Ionizing Radiation