

## FOREWORD TO THE SPECIAL ISSUE “THE CHORNOBYL NUCLEAR ACCIDENT: THIRTY YEARS AFTER”

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*Dear Reader!*

The 2016 Special Issue of Experimental Oncology is dedicated to the 30<sup>th</sup> anniversary of the Chernobyl disaster, medical and biological consequences of which still have a negative impact on the health of the population of Ukraine and other affected countries. In the XX century it became apparent that anthropogenic activities lead to environmental pollution, causing the man-made environmental problems on a planetary scale. Radiation accidents at Chernobyl and Fukushima-I (Japan, Honshu isl.) showed that nuclear reactors, more than 400 in the world, have no guarantee of absolutely safe operation. Analysis of international experience shows that the consequences of the major nuclear accidents are not confined to one country or region, sharply aggravating the environmental situation. Radionuclides ejected from the reactor migrate in water, soil, air, become included in the food chain and accumulate predominantly in parenchymal organs of human body, irradiating it from the inside. In addition, intensive extraction of gas, oil, and other minerals from the bowels of the earth, is accompanied by radionuclide contamination of the biosphere. All this leads to a steady rise in the Earth's radiation background. It is increasing the likelihood of human exposure to ionizing radiation, which is a causative factor in the development of stochastic effects, including carcinogenic [1–3].

With the end of the period of influence of the short-lived radionuclides on the health of the population of the affected countries, currently there dominate metastable transuranic elements, the negative impact of which will grow into an even more remote post-Chernobyl period.

Oncological diseases pose the greatest risk among long-term medical consequences of the Chernobyl disaster [4]. If deterministic effects of the Chernobyl disaster (general somatic diseases) are implemented to the level of decompensation in 25 years post-accident period, the stochastic ones, including carcinogens, have no time constraints [5].

Today is accumulated unique epidemiological, clinical and experimental material, partly presented in this issue, which applies to both cleanup workers and populations of contaminated areas.

In the articles of this issue of the journal “Experimental Oncology” are presented the results of epidemiological studies of hematologic consequences of the

accident at the Chernobyl nuclear power plant in the adult population of Ukraine, Belarus and the Russian Federation; results of cytogenetic monitoring of the somatic cells of cleanup workers and population who had contact with ionizing radiation; the peculiarities (in particular “bystender” effect) of the emergence of genetically irreversible changes. In the reviews, the carcinogenic effects of excessive radiation doses and their modification, and the molecular markers of apoptosis during radiation carcinogenesis are analyzed and discussed.

Especially noteworthy is the work on the cytogenetic effects in children who were in the womb at the time of the accident, with calculated cancer risks in the postnatal period.

Radio-ecological, medical and biological consequences of the Chernobyl accident, including presented in this issue of the journal “Experimental Oncology”, clearly shows the underestimation of primary prevention of radiogenic diseases and above all cancer. Given the continuing chronic exposure of inhabitants of radiation polluted territories, modification (synergy, comutagenesis) of the effects of excess radiation dose, exactly this level of prophylaxis is a priority in reducing cancer incidence of these population groups [6].

Finally, I am grateful to all the authors for their generous contributions to this issue.

**Prof. V.F. Chekhun, Editor-in-Chief**

### REFERENCES

1. **Tirmarche L, Baysson H, Telle-Lamberton M.** Uranium exposure and cancer risk: a review of epidemiological studies. *Rev Epidemiol Sante Publ* 2004; **52**: 81–90.
2. **UNSCEAR United National Scientific Committee** on the effects of atomic radiation 2006 report to the General Assembly with scientific annexes. Sources and effects of ionizing radiation. New York: United Nations, 2009. 333 p.
3. **Schonfeld SJ, Lee C, Berrington de Gonzalez A.** Medial exposure to radiation and thyroid cancer. *Clin Oncol (R Coll Radiol)* 2011; **23**: 244–50.
4. **Romanenko AY, Finch SC, Hatch M, et al.** The Ukrainian-American study of leukemia and related disorders among Chernobyl cleanup workers from Ukraine: III Radiation risk. *Radiat Res* 2008; **170**: 711–20.
5. **Twenty five years after the Chernobyl Accident.** Security of the future. National Report of Ukraine. Kyiv: KiM, 2011. 368 p.
6. **Domina EA.** Radiogenic cancer: epidemiology and primary prevention. Kyiv: Naukova Dumka, 2016. 196 p. (in Russian).