

## **Title: MRET Activated Water as Dietary Countermeasures to Mitigate Cancer Risk from Space Radiation.**

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**Objectives:** The major goal of space radiation research is to enable the human exploration of space without exceeding limiting risks from space radiation. Space radiation is distinct from common terrestrial forms of radiation because it is comprised of high-energy protons and heavy ions and their secondary produced in shielding and tissue. The proposed study will seek to reduce the uncertainties in risk predictions for cancer and acute radiation risks by utilizing MRET (Molecular Resonance Effect Technology) activated water as a dietary countermeasure to mitigate acute radiation risks. The objectives of the study was focused to show that MRET activated water can be utilized to reduce the risk of DNA damage processing that underlies radiation effects in general. The goal of this investigation was to study the effect of MRET water for the prevention and treatment of two kinds of oncology diseases on mice (laboratory models of Ehrlich's ascites tumor and Sarcoma ascites form). MRET Water is produced with the help of patented (US Patent No. 6,022,479), non-chemical Molecular Resonance Effect Technology (MRET). The anomalous electrodynamic characteristics and viscosity of MRET water provide some evidence regarding the possible effect of MRET water on electrical activity and proper function of the cells.

**Methods:** The ability of animals for tumor resistance was studied in the experiments conducted at Kiev State University and Institute of Experimental Pathology, Oncology and Radiobiology, Ukraine Academy of Science on 500 mice (22 groups with 20 mice in each and 10 groups with 5 mice in each group) with the help of the following methodology:

- a) study of possible anti-tumor effectiveness of “preventive” administration of different fractions of MRET water; mice received MRET water during 2 weeks before tumor cell transplantation and after transplantation;
- b) study of possible anti-tumor effectiveness of “therapeutic” administration of different fractions of MRET water; mice received MRET water after tumor cell transplantation;
- c) investigation of functional cytotoxic activity of lymphocytes containing natural killer cells (NK-cells) isolated from spleens of mice (without tumors) which received MRET water; lymphocytes were incubated with tumor target cells.

**Results:** The experimental results confirm that consumption of all types of MRET water leads to the significant inhibition of tumor growth and suppression of mutated tumor cells. The best results were observed in the groups of mice on MRET water activated for 30 minutes (optimal regime). The resulting decrease of the Total Number of Viable Tumor Cells was **76%** in “preventive treatment” group and **55%** in “therapeutic treatment” group.

The survival of the investigated animals was daily monitored in order to study the effect of different activated water fractions on dynamic and survival indices of tumor-bearing mice. The data of the dependence of changes of life span of tumor-bearing mice for both application regimes and all types of activated water are presented on Fig. 2. The observed life span of mice which received optimal activated water in “preventive treatment” regime increased **by 61.7%** compare to the control group.

The increase of **cytotoxic index** in both regimes (**21 days and 14 days** of application of activated water for mice without tumors) **by 26% and 10%** respectively was observed only in the groups of mice under MRET water activated for 30 minutes.

**Conclusions:** The significant positive effect of MRET activated water on tumor resistance of animals was observed in the process of this investigation *in vivo* in all groups of mice on different fractions of activated water. The significant anti-tumor effect of MRET Activated distilled water on mice was close to the action of the chemotherapy agents and allowed to avoid the side effects that typically follow chemotherapy treatment of oncology. The application of activated water can be quite promising approach for non-drug stimulation of NK-cells immunization vaccines.