

## MRET Activated water as possible agent for treatment in oncology models

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### Abstract

**Objectives:** The goal of this investigation was to study the effect of MRET activated water *in vitro* on HeLa cancer cells, and *in vivo* for the prevention and treatment of two kinds of oncology diseases in 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 *in vitro* investigations on normal PMBC cells (peripheral blood mononuclear cell) and on HeLa cancer cells (cell line ATCC # CCL-2 cervical adenocarcinoma) were conducted at AltheaDx Technologies, San Diego, USA. The experiments analyzed: cells lysed at 0 hour, cells cultured for 24 hours in untreated medium and cells cultured for 24 hours in medium treated with MRET activator for 30 minutes. DNA samples from each batch were processed and the resultant data was analyzed using Affymetrix Genotyping Console 3.0 to obtain genotype calls and copy number calls. Cell counts and % viability were obtained using the Trypan Blue exclusion technique.

The ability of animals for tumor resistance was studied in the experiments conducted 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 *in vitro* experimental data revealed no difference between the zero hour (control), MRET treated and untreated samples in term of genotypes and copy number calls. Thus, MRET activation of water based medium **did not induce any changes in cells on genetic level**. The study showed that in MRET activated medium **the viability of normal cells (PBMC) was higher**, and **the viability of cancer cells (HeLa) was lower** compared to the viability in untreated medium. For normal cells (PBMC) the changes in cell counts were similar for untreated and MRET treated medium. Thus, MRET treatment **did not affect the growth of normal cells**. For cancer cells (HeLa) the experimental data revealed **significant inhibition of cancer cells growth** in MRET treated medium. The growth of viable cancer cells was inhibited **by 54%** in MRET treated medium compared to untreated medium. The *in vivo* 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 observed average survival time 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:** It is possible to conclude that the studies *in vitro* conducted at AltheaDx Technology confirm that MRET activated water did not affect cells morphology on genetic level; it affected the morphology of normal cells (PBMC) in a positive way increasing their viability and promoted significant inhibition of cancer cells (HeLa) growth.

The *in vivo* study at Kyiv Institute of Experimental Pathology, Oncology and Radiobiology of Ukrainian Academy of Science confirms significant positive effect of MRET activated water on tumor resistance in animals in all groups of mice on activated water. The significant anti-tumor effect of MRET Activated water on mice was close to the action of the chemotherapy agents and allowed to avoid the side effects that typically follow chemotherapy treatment. The application of activated water can be quite promising approach for non-drug stimulation of NK-cells immunization vaccines.