

# ESVONC Annual Congress

## Abstract Submission Form

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**Submission deadline 31<sup>st</sup> January 2009 by email to [mb673@cam.ac.uk](mailto:mb673@cam.ac.uk)**

preferred publication: oral presentation

**Abstract Title:** Oncothermia basic research II. - Results of the in vivo studies

**Author(s):** Andocs G.(1), Balogh L.(2), Galfi P.(1), Fonyad L.(3), Jakab Cs.(4), Szasz A.(5)

**Institute & Address:** (1)Department of Pharmacology and Toxicology, Faculty of Veterinary Science, St Istvan University, Budapest, Hungary, (2) National Research Institute for Radiobiology and Radiohygiene, Budapest, Hungary, (3) 1st Department of Pathology and Experimental Cancer Research, Semmelweis University, Budapest, Hungary, (4) Department of Pathology, Faculty of Veterinary Science, St. István University, Budapest, Hungary, (5) Department of Biotechnics, Faculty of Engineering. St. István University. Budapest. Hungary

**Contact e-mail:** gandocs@gmail.com

**Objective:** Discussions about the role of temperature effects has a long history in the hyperthermia applications in oncology. Debate is intensive for electromagnetic heating in tumor. Our objective is to study the temperature independent factors in modulated capacitive coupled, tissue-specific, radiofrequency heating method, oncothermia, (OT).

**Material and Methods:** Nude mice have been xenografted with HT29 human colorectal carcinoma cells. 28 mice in 4 groups each with 7 animals and each animal with 2 tumors (totally 56 tumors ) were included in the present study: group (1) untreated control ; (2) treated with conventional hyperthermia (HT) at 42° C; (3) treated with OT at identical 42° C; (4) treated with OT at 38° C (by intensive cooling the tumor). 24 hours after a single treatment animals were sacrificed and the tumor cross-sections were processed with standard HE staining and were studied by digital microscopy using morphometric software for measuring the respective relative amount of destroyed tumor cells.

**Results:** Effect of OT established a double effect as a synergy between the purely thermal (temperature dependent) and non-thermal (not directly temperature dependent) effects. We had shown the solely thermal enhancement ratio (TER) of the cell-killing is 2.9. The field enhancement ratio (FER) at constant temperature of 42°C was measured as 3.2. Their complex application increased significantly the therapeutic enhancement to 9.4. We observed significant synergy between the purely temperature dependent and thermally induced but not directly temperature dependent effects.

**Conclusion:** The oncothermia is about three times more effective than the applied heat alone.

**General Member**

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Malcolm Brearley e-mail: [mb673@cam.ac.uk](mailto:mb673@cam.ac.uk)