

Challenges and perspectives of hyperthermia in oncology

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Background: Hyperthermia could not find its established place among the 'gold standards' of the oncotherapies until now. We have to understand better the basic effects induced thermally and/or non-thermally.

Challenges: Dosing of hyperthermia is completely different from other therapies. In case of hyperthermia the dose connected to tumor temperature which is indefinite, spread by blood and surrounding tissues. There are numerous electromagnetic hyperthermia methods distinguished by the kind of the fields, frequencies, heated volume, and conjunction with other methods, etc. The technical challenge of the deep-heating and the surface overheating is serious, and by the surface heat-sink blocks applying energy as dose parameter. Current therapies target the cell/DNA replication, the angiogenesis, the invasion process metastasizing, so the recognized processes in the actual tumor-development. The new trend targets the evolution of the disease, targets the control of the processes instead of blocking one or two of its components. Like it is formulated by B. West (US Army Research) [1]: 'Disease is not loss of regularity, but the loss of complexity'. Solution: Hyperthermia must go on the immune-direction, too. A couple of years ago Oncotherm patented a pioneering knowledge about the tumorvaccination which completes the molecular biology knowledge and the integrative medicine approach based on immuno-stimulation effects. There is a new method emerging: oncothermia. The careful, patented control of physiology of the skin at the treated volume makes it possible to pump the highest available energy through the epidermis without toxicity. This makes it possible to use the precisely matched and measured energy as control parameter. The new technology focuses the energy selectively to nano-range of the membrane of malignant cells [2]. The main medical advantages of the method together with the effective selection and distortion of the malignant cells are the blocking of their dissemination as well as promoting the bystander (abscopal) effect acting on far distant metastases by immune stimulation induced by oncothermia local treatment. Numerous clinically proven results are published.

Conclusion: Oncothermia applies synergy of the bioelectromagnetism with the fractal physiology. It is a vivid way solving the old-problems in hyperthermic oncology: it is a controlled, reproducible and reliable treatment. Oncothermia treatment induces massive cell death leading to immunogenic cell-death which is the basis of patented tumorvaccination. References: [1] West B.J. (2007) Where medicine went wrong: Rediscovering the path to complexity, World Scientific [2] Szasz O, Szasz A. (2014) Oncothermia- Nano-heating paradigm, J. Cancer Sci. Ther. 6:117-121