Essence of Oncothermia

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What are the limits of the old hyperthermia approach?

New paradigm is necessary for oncology
- Hypothesis contradiction
  - "The biology is with us when the physics is against us" (L. Overgaard)
- Oncothermia changes the paradigm
  - The biology is with us and the physics is with us

Avoid from high temperature
- "Physics is with us, when we use it well!"
  - Temperature heats up the vicinity of tumor; it can not be locally focused.
  - Temperature increases the danger of heating para in depth manufacturing, conduction, etc.
  - Temperature requires the increase of the safety cooling on the skin
  - The increased surface cooling blocks the temperature sensing in the skin.
  - Temperature increases the blood flow in the region, in consequence decreases the dissipation.
  - In conclusion, the combination of radiation with hyperthermia increases the cytoxic side effects in the treated healthy tissues around.

Temperature is not dose
- "Physiology is with us"
  - Modern temperature avoids the normal organ-regulating effects.
  - Temperature does not exceed the systemic physiologic limit (42°C).
  - Tumor selection is solved by non-temperature dependent way (electric properties).
  - Focus is to be held on the tumor, moves together with the natural body autonomy (autofluorescence control).
  - Selection is solved on cellular level suppresses the dissemination of the malignant cells.
  - Cellular connections (coherence connections, syncytium) of malignant cells are maintained to avoid further dissemination.
  - Cellular communication (axon signal) is revitalized to promote the growth by programmed cell death in malignant cells.
  - Possibility of the cellular interactions (mimic junctions) is revitalized to promote the normal function of the cells.

The "master switch" (p53 gene) is activated promoting the natural way of cell death.
- Cell-membrane permeability is increased to express the MDR on the outer membrane signaling the cell membrane for the systemic immune action.
- Cell-membrane is subjected to various communication pathways in the tissue.
- Electric field blocks the positive feedback loop of tumor-supporting injury currents.

Avoid the static approach
- "Thermodynamic considerations are against us"
  - Measurement of intensive thermodynamic parameters (like temperature) supports less local equilibration, which never could be restored due to the intensive factor-regulatory effects. This concept however, becomes the main request of the classical hyperthermia approach in its guidelines.
  - The heat factor increases the need for the blood stream, which is an effective cooling media to block the static concept.
  - The heat flow is blocked supports the positive feedback loop of the basic acidic environment and promotes the intensive growth of the tumor by accelerated oxygen delivery.

Technical specialties of oncothermia
- The nano-scale heating
  - Target cell-membrane in nano-scale (correct energy on demand).
  - Personalized information delivery is applied (patented).
  - Surface cooling is controlled (patented).
  - Low voltage large current (safety gure) is applied (patented).
  - Nano-functional modulation is activated (patented).
  - No temperature measurement is necessary (enabled).
  - Every part is designed to the actual task (oncotherm design).
- Easy to use, comfortable for patient, tailored for patient.

Application of dynamic processes
- "Thermodynamics and fractal physiology is with us"
  - Oncothermia uses tumor killing approach, which is well fitted to the dynamics of the living system, does not constrain for precise definition.
  - Control of oncothermia is natural, always fitted to the actual conditions (changes of the environment determines the actions).
  - No considerable heat flow to the blood stream by oncothermia, no gain of the positive feedback of electricity balancing-loop.
  - Thermal gradients make dynamic in a very local area of the cell-membrane of malignant cells. The adapted applied solution focuses on the thermal non-equilibrium.
  - The relatively slow "set-up" heating keeps the non-physiological conditions for short time action.
  - The slow heating does not create considerable physiological contradictions.
  - The slow heating makes the healthy tissue adapt to the growing temperature.
  - The slow temperature changes do not generate high stress and following stress response.
  - The applied electric field at least three times more effective cell killing than the temperature does.
  - The applied fractal modulation makes possible selecting and supporting the natural processes to achieve the natural healing mechanisms and maintain the healthy "social signal" between the selected cells, promoting the anti-malignancy collectively.

Avoid automatisms in treatment guidelines
- Guidelines are not "cookery books"; we are in the clinic and not in the kitchen.

Everybody is different...
  - The actual disease is not simple the disease of organ. The target is unpredictable.
  - The personal differences are modified by the previous treatments and comorbidities.
  - The definite similarities after the other chemotherapeutic or other serious treatments are mainly due to the side effects.
  - Most of the decisions in serious cases need medical experience, not "only" book-based evidence.
  - The patients with advanced diseases are not "sane" in most of the cases. Their high line treatments need personal decisions, frequently no evidence-based processes are available for their special cases.
  - Many times the pain is necessary, which definitely needs personal decisions.

The psycho-factors are not negligible in the case of malignant diseases.
  - The personal decision is the responsibility of the experienced doctor.

Make personalized processes
- Guidelines of the thinking for experienced physicians
  - Oncothermia is mainly regulated by the patient's tolerance
  - Oncothermia control is based on thermal sensing of the patient, safety and for effectiveness reasons. Safety is avoiding "burning the tissue of the subconscious layers, the efficacy to apply such energy, which does not overload the patient natural protecting system.
  - Oncothermia uses natural processes to sense understanding and using these needs thinking doctors and their patients.
  - Oncothermia influences of natural physiology regulation, which decrease understanding of the processes.
  - Oncothermia needs permanent dynamic approach, follow-up is "how is happening during the treatment.
  - Step-up heating is the basic treatment approach, which prevents permanent care to the process.
  - The effort of the administered natural processes are not acting immediately. To have a correct treatment by treatment is essential.
  - The patient's well being during and after the treatment is necessary side of the well conducted protocol.
  - Complete reaction could be supported by relaxing music, videos or sound effects during the treatment.

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