

Colossal Magnetic Heat Induction of Magnesium shallow Doped γ -Fe₂O₃ Nanofluids (Hypertheranoid™-1) and Somatically Safe AC Magnetic Field Generator system (Hypertheranoid EX™) for Clinical Hyperhemria

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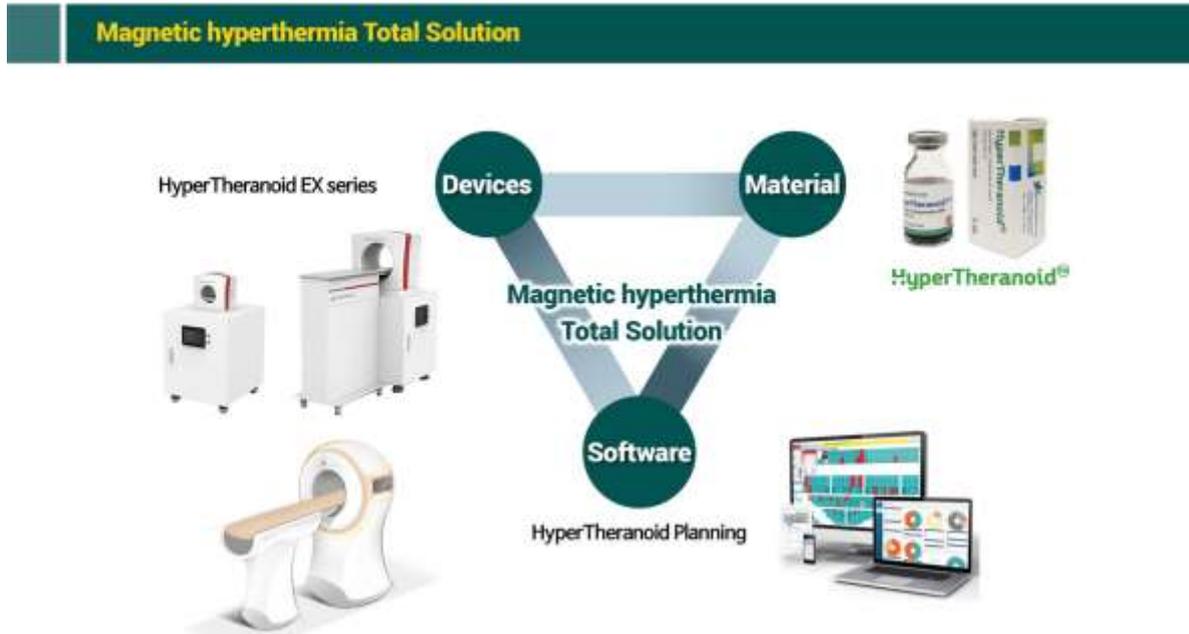
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Abstract - Magnetic Nanofluid Hyperthermia (MNH) has been recently paid an enormous attention as a Renaissance of cancer treatment modality due to its prominently “low side effects” and unbelievably high treatment efficacy compared to conventional chemotherapy and radiotherapy. However, insufficient AC magnetic induction heating power at the biologically and physiologically safe range of AC magnetic field ($H_{\text{appl}} \times f_{\text{appl}} < 3.0 \sim 5.0 \times 10^9 \text{ Am}^{-1}\text{s}^{-1}$), and essentially required high in-vitro & in-vivo biocompatibility including biocleanance with chemical colloidal suspension stability of superparamagnetic nanoparticle (SPNP) hyperthermia agents have still remained as critical issues to be overcome for achieving successful clinical hyperthermia in cancer clinics. Furthermore, development and commercialization of an automatically/precisely controllable and somatically safe AC magnetic induction coil generator for small-, or mid-sized animals (pre-clinical studies) as well as for human patients (clinics) has been considered as another vitally important challenge in highly efficient and systematic MNH in cancer clinics.

In this talk, the newly designed and developed commercialized (for research use only) magnesium shallow doped γ -Fe₂O₃ nanofluids (Hypertheranoid™-1) with exceptionally high intrinsic loss power (ILP) in a range of $7 \sim 14 \text{ nHm}^2\text{kg}^{-1}$, which is a 50 ~ 100 times higher than that of commercial Fe₃O₄ (i.e, Feridex, ILP = $0.15 \text{ nHm}^2\text{kg}^{-1}$) at the $H_{\text{appl}} \times f_{\text{appl}} = 1.23 \times 10^9 \text{ Am}^{-1}\text{s}^{-1}$ ($H_{\text{appl}} = 120 \text{ Oe}$, $f_{\text{appl}} = 100 \text{ kHz}$) will be primarily discussed, and also our newly commercialized Hypertheranoid™-EX AC magnetic field generator series, which produce automatically controlled precise and somatically safe AC magnetic field, for small, and mid-size animal cancer treatment for veterinary clinic, and for human patients in cancer clinic. Pseudo bio-environmental studies, as well as in-vitro & in-vivo MNF studies using Hypertheranoid™-1 nanofluids and Hypertheranoid™-EX series were conducted to evaluate the bio-feasibility and bio-availability for preclinical and clinical applications. According to all the bioavailability testing results, it was clearly confirmed that the newly developed Hypertheranoid™ system showed promising hyperthermic effects with extremely high biocompatibility (no in-vitro and in-vivo cytotoxicity) to potentially destroy the solid cancers with extremely minimal side effects. Furthermore, Hypertheranoid™ system provided highly efficacious total solution of a new paradigm of MNF clinical hyperthermia in cancer clinics (See Figure 1).

Figure |



Total solution of Magnetic Nanofluid Hyperthermia (MNH) by [Hypertheranoid™](#) system to treat solid cancers with exceptionally high treatment efficacy

