Supplementary Materials

Externally applied electromagnetic fields and hyperthermia irreversibly damage cancer cells



**Figure S1.** Effect of shRNA-induced downregulation of Hsp70 on the EMFs and HT-induced increase in cytosolic cathepsin activities in AsPC1 cells. (**A**) Hsp70 protein levels (western blots) were measured in control and EMFs and HT-treated AsPC1cells pretreated with anti-Hsp70-shRNA (n = 4 \*\**p* < 0.01 comparing EMFs and HT-treated cells versus untreated controls). (**B**) Cathepsin activities in the cytosolic fraction were measured after exposure to EMFs and HT (4h-protocol as in Figure 1C). A one-way analysis of variance (ANOVA) was used to make comparisons among the different experimental conditions for each cathepsin activity. Different letters indicate statistical differences *p* < 0.05. (n = 4-5).

**Figure S2.** Whole blots: (**A**) Figure 3C, (**B**) Figure 4A and (**C**) Figure S1.

**Table S1.** Hematology and clinical chemistry data in AsPC1-bearing mice treated to induced suppression of the growing tumor.Full treatment means the combination ofEMFs+HIFU+GEM+PT as in Figure 7B. A one-way analysis of variance (ANOVA) was used to make comparisons among the different experimental groups. Different letters indicate statistical differences *p* < 0.05 (n = 7 mice per experimental group).

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| --- | --- | --- | --- | --- | --- |
|  |  | **Non-tumor**  **bearing mice** |  | **Tumor-bearing mice** | |
|  |  |  | **One day**  **after treatment** | **Two months**  **after treatment** |
| Animal weight (g) |  | 25.0 ± 1.2b |  | 20.5 ± 0.9c | 29.3 ± 1.5a |
| **Hematology** |  |  |  |  |  |
| Hematocrit (%) |  | 38.7 ± 0.6a |  | 25.4 ± 1.3b | 37.5 ± 0.9a |
| Hemoglobin (g/dL) |  | 13.8 ± 0.2a |  | 8.6 ± 0.5b | 13.5 ± 0.4a |
| Erythrocytes (106/L) |  | 8.9 ± 0.3a |  | 5.3 ± 0.4b | 8.4 ± 0.5a |
| Mean red cell volume (m3) |  | 41.7 ± 0.5a |  | 40.6 ± 0.6b | 42.1 ± 0.5a |
| Mean red cell hemoglobin (pg) |  | 15.0 ± 0.3a |  | 14.5 ± 0.4a | 15.1 ± 0.3a |
| Platelets (103/L) |  | 496 ± 27a |  | 184 ± 45b | 480 ± 33a |
| Leukocytes (103/L) |  | 7.0 ± 1.0a |  | 2.1 ± 0.5b | 6.5 ± 0.8a |
| Neutrophiles (103/L) |  | 1.3 ± 0.2a |  | 0.4 ± 0.1b | 1.2 ± 0.3a |
| Lymphocytes (103/L) |  | 5.2 ± 0.6a |  | 1.3 ± 0.5b | 5.1 ± 0.4a |
| Monocytes (103/L) |  | 0.2 ± 0.05a |  | 0.1 ± 0.05a | 0.2 ± 0.1a |
| Eosinophiles (103/L) |  | 0.1 ± 0.05a |  | 0.02 ± 0.01b | 0.1 ± 0.05a |
| Basophiles (103/L) |  | 0.0 ± 0.0a |  | 0.0 ± 0.0a | 0.0 ± 0.0a |
| **Clinical chemistry** |  |  |  |  |  |
| Urea (mg/dL) |  | 50.5 ± 3.0b |  | 56.7 ± 2.5a | 51.4 ± 2.2b |
| Uric acid (mg/dL) |  | 2.7 ± 0.5a |  | 1.3 ± 0.2b | 2.4 ± 0.4a |
| Total protein (g/dL) |  | 5.7 ± 0.2a |  | 5.4 ± 0.3a | 5.6 ± 0.2a |
| Albumin (g/dL) |  | 4.5 ± 0.2a |  | 4.3 ± 0.1a | 4.5 ± 0.2a |
| Creatinine (mg/dL) |  | 0.6 ± 0.02b |  | 0.7 ± 0.03a | 0.6 ± 0.02b |
| Glucose (mg/dL) |  | 207 ± 25a |  | 151 ± 18b | 218 ± 26a |
| Total bilirubin (mg/dL) |  | 0.5 ± 0.2a |  | 0.8 ± 0.2a | 0.5 ± 0.1a |
| Direct bilirubin (mg/dL) |  | 0.1 ± 0.02b |  | 0.2 ± 0.03a | 0.1 ± 0.02b |
| Asp aminotransferase (IU/L) |  | 220 ± 17b |  | 576 ± 102a | 239 ± 30b |
| Ala aminotransferase (IU/L) |  | 9.4 ± 2.1c |  | 178 ± 26.4a | 36.0 ± 10.5b |
| -Glutamyl transpeptidase (IU/L) |  | 2.0 ± 0.5c |  | 14.5 ± 3.7a | 3.5 ± 0.6b |
| Alkaline phosphatase (IU/L) |  | 151 ± 29b |  | 484 ± 86a | 187 ± 38b |
| Lactate dehydrogenase (IU/L) |  | 405 ± 55b |  | 1136 ± 277a | 439 ± 61b |
| Sodium (mEq/L) |  | 147 ± 15a |  | 156 ± 19a | 155 ± 21a |
| Potassium (mEq/L) |  | 7.7 ± 0.7a |  | 7.9 ± 0.8a | 7.5 ± 0.7a |
| Chloride (mEq/L) |  | 110 ± 8a |  | 105 ± 7a | 107 ± 11a |