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1: [Int J Hyperthermia](#). 2006 Sep;22(6):507-19.

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HSP27 phosphorylation increases after 45 degrees C or 41 degrees C heat shocks but not after non-thermal TDMA or GSM exposures.

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PURPOSE: Experiments with cultured HeLa, S3 and E.A. Hy296 cells were performed to determine if exposure to acute (30 min at 45 degrees C) or chronic (2 h at 41 degrees C) heat shocks or to non-thermal exposures of radiofrequency radiation (RF) induce changes in HSP27 phosphorylation. **MATERIALS AND METHODS:** The radiofrequency (RF) exposures used in this study were 847 MHz time division multiple access modulated (TDMA) at a specific absorption rate (SAR) of 5 W kg⁻¹ for 1, 2 or 24 h or 900 MHz GSM modulated (GSM) at a SAR of 3.7 W kg⁻¹ for 1, 2 or 5 h. HSP27 phosphorylation was evaluated by resolving the various phosphorylation forms using two-dimensional gel electrophoresis measuring the relative amount of each by densitometry. Alternatively, an antibody specific for phosphorylated HSP27 was used to detect changes in HSP27 phosphorylation levels. All heat shock and RF exposure conditions were analysed simultaneously along with a matched incubator control sample. Each experiment was repeated three times. **RESULTS:** Following heat shock, the degree of phosphorylation of HSP27 varied with the heat dose, with acute hyperthermia (45 degrees C) having an increased proportion of higher phosphorylated forms. Exposure of HeLa S3 cells to 5 W kg⁻¹ TDMA for 1, 2 or 24 h did not induce significant differences in the levels of HSP27 phosphorylation compared to incubator control or sham. Exposure of E.A. Hy926 cells to 3.7 W kg⁻¹ 900 MHz GSM for 1, 2 or 5 h did not induce significant differences in the levels of HSP27 phosphorylation compared to sham exposed. **CONCLUSIONS:** Acute and moderate hyperthermia significantly increase HSP27 phosphorylation, but there was no significant change in the levels of HSP27 following non-thermal exposure to TDMA and GSM modulated RF radiations.

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