

Tumors may respond to extreme and moderate heat

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Aided by ultrasound guidance, treating tumors with extreme heat or moderate heat may provide a possible therapeutic option, according to early research presented at the second AACR Dead Sea International Conference on Advances in Cancer Research: From the Laboratory to the Clinic, held March 7-10, 2010.

"Low temperature controlled hyperthermia and high temperature treatments are beneficial in curing both malignant and benign tumors using minimally invasive and noninvasive ultrasound techniques," said Osama M. Al-Bataineh, Ph.D., an assistant professor in biomedical engineering at the Hashemite University in Jordan.

Hyperthermia has previously been shown to increase [radiation damage to cancerous tissue](#) and prevent subsequent tissue repair. It has further been shown to enhance chemotherapy and immunotherapy treatments by changing the microcirculation and blood vessel permeability properties of a tumor.

Al-Bataineh and colleagues performed the following laboratory experiments.

Using [magnetic resonance imaging](#) (MRI) guidance, they were able to maintain desired temperature levels of 43 degrees Celsius for 30 minutes, which is considered the optimal dose to cause the required biological effect for hyperthermia treatment.

In a related experiment, high temperature (greater than 50 degrees Celsius) for between one to two minutes caused permanent tissue damage to the prostate tumor. High temperature treatment appeared to induce necrosis, or cell death.

Al-Bataineh said both extreme and moderate heat appear to have a clear effect on the tumor's [cellular structure](#), but further research would need to be done before any studies are conducted in humans.

Provided by American Association for Cancer Research

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