

**University of Puerto Rico
Mayagüez Campus
Chemistry Department
Departmental Seminar**

**Friday, FEBRUARY 15TH , 2016
Q -123
Abbott Room
11:30 AM**

By

**Dr. Madeline Torres Lugo
Chemical Engineering
Universidad de Puerto Rico, Mayagüez**

**HSP70 inhibition synergistically enhances the effects of magnetic fluid
hyperthermia in ovarian cancer**

ABSTRACT:

Hyperthermia has been investigated as a potential treatment for cancerous tumors. However, specificity in hyperthermia application remains a challenge. Magnetic fluid hyperthermia (MFH) may be an alternative to surpass such a challenge, but implications of MFH at the cellular level are not well understood. Therefore, the present work focused on examination of gene expression after MFH treatment and using such information to identify target genes that when inhibited could produce an enhanced therapeutic outcome after MFH. Genomic analyzes were performed using ovarian cancer cells exposed to MFH for 30 min at 43°C. Analysis revealed that heat shock protein genes, including HSPA6, were upregulated. HSPA6 encodes the heat shock protein Hsp70 and its expression was confirmed by PCR in HeyA8 and A2780cp20 ovarian cancer cells. Two strategies were investigated to inhibit Hsp70 related genes, RNA interference and Hsp70 protein function inhibition by 2-phenylethanesulfonamide (PES). Both strategies demonstrated a decrease in cell viability when cells were exposed to MFH. Combination index was calculated for PES treatment reporting a synergistic effect. *In vivo* efficacy experiments were performed in Nu/Nu mice with subcutaneous A2780cp20 and HeyA8 models and HSPA6 siRNA inhibition. A reduction in tumor growth rate was observed in combination treatments. PES and MFH efficacy were also evaluated in a HeyA8 orthotopic model, showing an antitumor effect. This work demonstrated that HSP70 inhibition, at protein or gene level, could be a promising target to enhance MFH therapeutic outcome in ovarian cancer.