

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

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**11:30 AM**

**Q – 123**

**Abbott**

**Dr. Edu B. Suarez Martínez**

**Chemotherapeutic Effect of Calcium Sulfide Nanostructures in Lung Cancer Cell Lines**

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Lung cancer is the number one cause of death among deaths due to cancer in the United States independent of gender. Current treatments focus on surgical removal of tumors and surround tissue, chemotherapy, and radiation therapy. Side effects of the aforementioned treatments have been shown to be detrimental to a patient's health and wellbeing and are capable of causing secondary neoplasms. Recently, nanotechnology has shown promise in providing safer and more efficient therapy options for cancer patients. Our colleagues from the University of Puerto Rico at Mayagüez synthesized nanostructures composed of calcium sulfide (CaS). In this study, we evaluated the effect of CaS nanostructures on pulmonary adenocarcinoma cells by incubating ATCC CRL-2124 (HCC-827) cell line and non-malignant lung fibroblasts (MCR-5) in the presence of CaS nanostructures [3.8  $\mu$ M], Etoposide [10  $\mu$ M], and DMSO (vehicle) for 24-, 48-, and 72-hours after a single dose at time 0. We hypothesized that CaS nanostructures would suppress the cells' proliferation by interfering with their cell cycle phases and increasing apoptosis. In addition, we anticipated that apoptosis-mediated proteins will be differentially expressed in malignant *versus* non-malignant cell lines. We performed cell-based assays to study the cell cycle and apoptosis-mediated cell death and western blots for the determination of apoptotic proteins' expression. There were no statistically significant observations after 24 hours in non-cancerous cells. In contrast, our results showed that at 48-hours post treatment the progress of malignant cells from Sub-G<sub>1</sub> into G<sub>0</sub>/G<sub>1</sub> was suppressed along with an increase in apoptosis ( $p \leq 0.05$ ). After initial treatment with CaS nanoclusters we observed a built up of malignant cells in S phase at 24-hours ( $p \leq 0.05$ ). The CaS treatment showed to differently impact the protein expression profiles of malignant and non-malignant cell lines. These results provide a platform for elucidating the mechanism of action of CaS interfering with proliferation and apoptosis which may lead to new alternative chemotherapies for lung cancer.