The Development of a Biomarker for Pancreatic Ductal Adenocarcinoma Detection: Investigating Human Antigen R's Expression and Translocation in Response to Cytokine Regulator (cyclic GAMP) and Cytokine (Interferon Gamma) Using Immunocytofluorescence Staining

Myneni, Chandra Shriya (School: Oregon Episcopal School)

Background: Pancreatic Ductal Adenocarcinoma (PDAC) is the most common form of pancreatic cancer, a cancer with only a 12%-five-year survival rate. PDAC relies on the Human antigen RNA binding protein (HuR) to overcome tumor microenvironment (TME) stressors, such as low glucose, which can be observed by an increase in cytoplasmic HuR expression. Thus, as a PDAC tumor undergoing stress can be measured by the cytoplasmic HuR expression, the impacts of cytokines on HuR expression and translocation could reveal another method to detect the PDAC tumor by using it as a biomarker. Methodology: Using a KPC Cell Line, 5000 cells were pipetted into each well in an 8-well plate. One column measured the impact of the test groups over 4-hours, and the other measured the impact after 24 hours. The test groups were negative control, Low Glucose (positive control), cGAMP, and IFN-??. Results: The Low Glucose test group increased HuR expression, as expected of the positive control. Interestingly, cGAMP showed a statistically significant increase in HuR translocation, indicating that cGAMP might be a biomarker for detecting PDAC tumors. Conclusion: The potential of cGAMP should be further researched, especially regarding its possibility of being used as a biomarker to detect a PDAC tumor.

Awards Won: