Investigating the Effects of Propofol on Reduced Cell Proliferation and Invasion of Human Rheumatoid Arthritis Fibroblast-like Synoviocytes (RA-FLSs)

Imran, Maryam (School: American Heritage School of Boca Delray)

Rheumatoid Arthritis is a debilitating autoimmune disease in which the body— a person's immune system— attacks its own synovium. Rheumatoid arthritis results in heightened inflammatory responses that can lead to thickening of the synovium and gradual destruction of cartilage and bone. Unfortunately, drug-modifying antirheumatic drugs used to treat this disease can damage healthy bone in the process of trying to reduce inflammation. By exploring an alternative treatment, an anesthetic drug called propofol, such side effects could be reduced or potentially eliminated. This experiment investigated the effect of a commonly used anesthetic drug, propofol, on reduced cell proliferation and invasion of rheumatoid arthritis fibroblast-like synoviocytes (RA-FLSs). Three different drug concentrations were tested in order to observe whether or not the RA-FLSs's responded differently to different concentrations of the drug. The established concentrations were thirty, sixty, and ninety micromolar. The independent variable was the drug, propofol (and its three different concentrations), while the dependent variable was percent of viable cells for each concentration. The control was the cells that were not exposed to propofol (but still performed the MTT assay on). The results were determined using an MTT Cell Viability assay. Results showed that there was a range of 60.38-65.45% cell viability, meaning there was a 34.55-39.62% reduction in cells compared to the control. Although these numbers did not show dramatic cell reduction, the hypothesis was somewhat supported as propofol was able to decrease the amount of cells by more than ? compared to the control.

Awards Won: