

Optimizing an Orbital Shaker Method for Physiological Simulation of Endothelial Cells In vitro

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Atherosclerosis is a condition characterized by a buildup of plaque in the arteries. Changes in blood flow cause endothelial cells to become atheroprone (susceptible to atherosclerosis pathogenesis). I am finding an optimal orbital shaker method to replicate physiological flow for endothelial cells in vitro using accessible equipment. PTFE tubing is used to create boundaries between the outer rim (simulates healthy conditions) and center (simulates atheroprone conditions) within a 6-well plate. As of right now, cytotoxicity and leachate tests are being performed to ensure adhesives used to attach the PTFE tubing are not toxic to HAECs. Silicone adhesive has been less toxic for HAEC compared to Epoxy, so the next step is to make the adhesive more wettable using PVA, and to test a food-grade Epoxy. Future work will include validating the orbital shaker method is accurate using Western Blots and Immunofluorescences, as well as studying nanoparticle uptake during drug delivery to treat atherosclerosis?. Future implications in medicine will incorporate treating dendrimers (nanoparticles) with drugs that can then treat and prevent atherosclerosis.

Awards Won:

