

Almost half of the deaths in the developed world can be traced to some form of fibrosis. We aim to explore the roles that chronic cardiac inflammation plays in generating fibrosis of the heart using synergistic advanced tissue engineering and molecular imaging platforms. Specifically, we propose to develop microtissue constructs based on human stem cell-derived cardiomyocytes that create three-dimensional aligned human cardiac microtissues, coupled with activity-based sensing chemical probes for monitoring reactive oxygen species involved in immune cell activation. These studies will use the Agilent BioTeK Lionheart FX Automated Microscope to enable single-cell analysis in three-dimensional culture models.