Identifying Key Components of Extracellular Matrix in Vascularized Skeletal Muscle Tissues

by Patricia Garcia

Abstract Id: ***427*** *Submitted:* ***February 10, 2019*** *Event:* ***Conference for Undergraduate Research at FIU 2019*** *Topic:* ***Engineering/Engineering Technology***

Engineered skeletal muscle tissues have recently been used for a variety of applications in the development of actuators for bio-robots, pre-clinical drug advances, and transplantation. In native muscle tissues, fibroblasts contribute to the formation of the extracellular matrix (ECM) layer, called endomysium, which is located between myofibers and capillaries. Because the ECM layer is known to have significant mechanical and biological roles, it can protect myofibers during contraction, control muscle development, and mediate cell to cell interactions. However, there is a lack of knowledge in establishing key components of the ECM, especially in engineered skeletal muscles, which affect differentiation of muscles and vascularization of endothelial cells. In this study, we made a system to study secreted ECM in various cell combinations in a controlled environment and stained the ECM to identity key components. We hypothesize that the ECM secreted by fibroblasts is changed by heterotypic cell to cell interaction with muscle and endothelial cells. This research will help to understand the role of the endomysium in the native muscle, enhance vascularization, and improve muscle differentiation of engineered muscles.