

Title: Characterization of *Holothuria glaberrima* primary muscle cell cultures as a tool to screen drugs that mediate regenerative responses

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Echinoderms are recognized for their impressive regenerative properties. Innovative research has explored regeneration in different tissues and animals, but it is still a developing field. In our model system, the sea cucumber *Holothuria glaberrima*, these processes range from the complete regeneration of its digestive system following evisceration to the regeneration of muscle and nervous tissue following injury. In the process of muscle regeneration, two main steps have been documented: dedifferentiation and myogenesis. In dedifferentiation, structures known as “spindle-like structures” (SLS) form in muscle cells as a way to eliminate their contractile apparatus. This is followed by nuclear activation, where the cells prepare for proliferation and redifferentiation into new muscle cells. In order to further look into the cellular and molecular processes governing these steps, this project aimed to develop and characterize primary muscle cell cultures of *H. glaberrima*. Different cell morphologies have been identified: round, fiber-like, and fusiform. At different time-points, cells are labeled with Phalloidin and DAPI to observe actin and nuclei staining, respectively. Throughout the first five days in culture, we have observed that the number of fusiform morphologies increase, while fiber-like morphologies decrease. Round morphologies do not show significant changes. Interestingly, a decrease in Phalloidin staining might be linked to the differentiation process. On-going experiments are exploring the effects of different drugs in these cultures. We believe that the development of these cultures is a helpful tool to further explore the regenerative responses previously described.