

In Vivo Method for Labeling and Tracking Cells in the Mammalian Limb Bud

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The extracellular matrix (ECM) is composed of many different proteins excreted by cells and is believed to play a very important role in development as well as regeneration and wound healing. In this research, a method to determine the ECM's effect on the migration of muscle progenitor cells into the mammalian limb bud was investigated. It has traditionally been difficult to obtain in vivo images of the limb bud, due to the difficulty of maintaining embryos in culture and limitations of imaging techniques. In this study, we have worked on optimizing the culture conditions to allow growth of mouse embryos during multiphoton imaging. In combination with Cre-Lox technology, this technique allowed us to fluorescently label and image muscle progenitor cells in the developing limb bud. With further optimizations, this method will allow for real-time tracking of muscle progenitor cells or other labeled cell types. With this imaging method established, it will be possible to determine the effect of the various ECM molecules on the migration of the muscle progenitors into the limb bud via genetic knockouts, as well as a multitude of other possibilities.