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The Dynamics of Sonic Hedgehog Function in Salamander Limb Development

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THE DYNAMICS OF SONIC HEDGEHOG FUNCTION IN SALAMANDER LIMB DEVELOPMENT

Smith: The Dynamics of Sonic Hedgehog Function in Salamander Limb Develo

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Sonic hedgehog (Shh) is a diffusible morphogen that is expressed in the posterior of tetrapod limbs and patterns the anterior-posterior axis of the limb. Reduction of Shh signaling has been implicated as a likely mechanism in evolved loss of digits in many tetrapod species that have digit numbers fewer than those in the most recent common ancestor of tetrapods. Much is known about the effects of Shh-based digit reduction on skeletal morphology, but little work has been done on the effect of Shh-based digit reduction on muscle development. It is unknown whether muscle morphology and identity is determined moreso by the position of the developing muscle anlage, or by the location of the muscle relative to the digits. Here we use short exposures to cyclopamine, which blocks a cell-surface protein that functions in sensing and transmitting the Shh signal. We seek to experimentally remove a single digit from the forelimbs and hindlimbs of the salamander *Ambystoma mexicanum*, with the intention of subsequently analyzing multiple stages of the development of limb muscle morphology and identity.