TGF-beta: A retrograde signaling molecule involved in the formation of neuromuscular junctions in C. elegans

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The aim of this research is to investigate the role of Transforming Growth Factor Beta (TGF-B) in the formation of neuromuscular junctions in the nematode. Laser ablation of selected embryonic myoblasts removes guidance markers used by post-embryonic muscles (1). The absence of these guideposts results in migrating muscle losing their way and differentiating in ectopic locations. These ectopic muscle strands become innervated by processes from the DD motor neurons (mns). We postulate that a retrograde signaling molecule released by the muscles induces neurite sprouting from the DD mns, resulting in the formation of ectopic neuromuscular junctions (nmjs). An earlier report, combined with our own observations focusing on post-embryonic muscle, indicate that the transient expression pattern of TGF-B corresponds to the nmj formation in the DD mns (2). Current experiments combining laser ablations in various mutant backgrounds, with green fluorescent protein expression patterns should shed light onto the communication between presynaptic and the post-synaptic elements at the nmj.