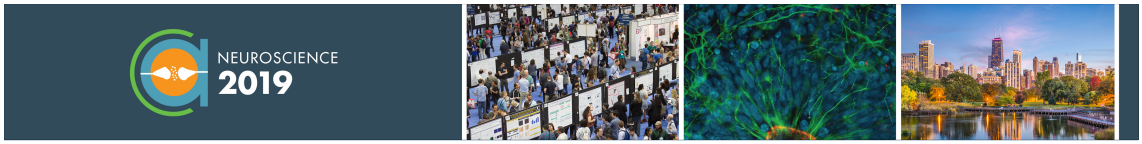

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Session 556 - Central and Peripheral Myelinating Cells I

Add to Itinerary

556.21 / B100 - Axon determination of subtype specific myelin ensheathment and pruning

October 22, 2019, 1:00 PM - 5:00 PM | Hall A

Presenter at Poster
Tue, Oct. 22, 2019 1:00 PM - 2:00 PM

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Abstract
In the developing central nervous system, pre-myelinating oligodendrocytes contact and sample candidate nerve axons by extending and retracting process extensions. Some contacts stabilize and mature, leading to the initiation of axon wrapping, myelin sheath formation, and sheath elongation by oligodendrocytes. Although axonal signals influence the overall process of myelination, which precise steps and oligodendrocyte cell behaviors require signaling from axons is incompletely understood. In this study, we investigated whether cell behaviors during the early events of myelination involve input from axons or are mediated by an oligodendrocyte-autonomous myelination program. To address this, we utilized *in vivo* time-lapse imaging in embryonic and larval zebrafish during the initial hours and days of axon wrapping and myelination. Transgenic reporter lines marked individual axon subtypes or oligodendrocyte membranes. In the larval zebrafish spinal cord, individual axon subtypes supported distinct nascent sheath growth rates and pruning frequencies. Oligodendrocytes ensheathed individual axon subtypes at different rates during a two-day period after initial axon wrapping. When the ratio of oligodendrocytes to target axons was increased by ablating spinal projection axons, local spinal neuron axons supported a constant ensheathment rate despite the increased ratio of oligodendrocytes to target axons. We conclude that properties of individual axon subtypes instruct oligodendrocyte behaviors during initial stages of myelination by differentially controlling nascent sheath growth and stabilization.

Abstract Citation