Mechanisms of Functional Synapse Reformation in Regenerated Axons

October 10

Tuesday, 12:30 pm

Billings Building—Rosedale Room

SPEAKER:

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Host: Vibhu Sahni, Ph.D.

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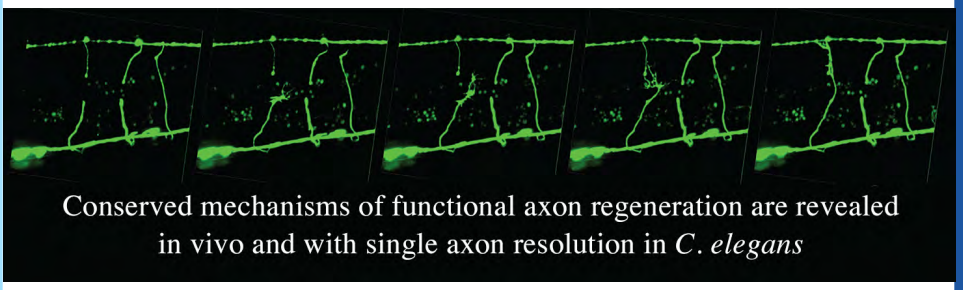
Abstract

Identifying and characterizing the molecular mechanisms that inhibit both axon regeneration and synapse reformation is critical to understanding how to repair the injured adult nervous system. To do so, we use a genetically tractable C. elegans model in which axon regeneration and synapse reformation can be studied in vivo with single axon resolution. I will present our recent findings of signal transduction pathways that function intrinsically and independently of one another to regulate axon regeneration, synapse reformation, and degeneration after injury. These include poly (ADP-ribosylation) and TIR-1/SARM signaling. Defining these conserved pathways adds to our understanding of the injury response and contributes to strategies to improve functional axon regeneration.



Conserved mechanisms of functional axon regeneration are revealed in vivo and with single axon resolution in *C. elegans*

Publications:

1. Czech VL, O'Connor LC, Philippon B, Norman E, Byrne AB. TIR-1/SARM1 inhibits axon regeneration and promotes axon degeneration. Elife. 2023 Apr 21;12 PubMed Central PMCID: PMC10121217.

2. Byrne AB, McWhirter RD, Sekine Y, Strittmatter SM, Miller DM, Hammarlund M. Inhibiting poly(ADP-ribosylation) improves axon regeneration. Elife. 2016 Oct 4;5 PubMed Central PMCID: PMC5050021.

3. Loring HS, Czech VL, Icso JD, O'Connor L, Parelkar SS, Byrne AB, Thompson PR. A phase transition enhances the catalytic activity of SARM1, an NAD+ glycohydrolase involved in neurodegeneration. Elife. 2021 Jun 29;10 PubMed Central PMCID: PMC8266388.

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