VANDERBILT
School *of* Medicine Basic Sciences
Department of Pharmacology

2024 - 2025 Seminar Series

"Kiss-of-Life": Bystander Neuroprotection Mechanism during Spinal Cord Injury

The adult zebrafish spinal cord exhibits a remarkable capacity for regeneration following traumatic insults, yet the cellular mechanisms driving this process remain poorly understood. Here, we demonstrate that while vertebrates share common cellular and tissue responses to injury, zebrafish fast spinal motoneurons exhibit exceptional resilience, maintaining both viability and function. We further reveal dynamic post-injury changes in glutamatergic input, motoneuron excitability, and calcium signaling, highlighting the crucial role of calretinin (CR) in intracellular calcium buffering. Notably, we uncover a neuron-to-neuron bystander neuroprotective mechanism mediated by gap junction channels. Our findings propose a model in which the coordinated interplay of glutamate signaling, calcium homeostasis, gap junction communication, and intercellular cooperation sustains neuronal survival and facilitates the initiation of regeneration.

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15 April 2025

4:00 PM

1220 MRB III

Host : Valentina Cigliola

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