

**NON -TECHNICAL ABSTRACT:** (State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)

The nervous system is made up of cells called neurons, which extend long projections during development called axons. These axons are necessary for communication with other neurons, which mediates such critical processes as perception, movement, and thought. Axons travel together in bundles, such as those that extend along the human spinal cord. Injury to axons is difficult to treat, because many axons lose their ability to extend after development. It is thought that molecular “stop signals” tell neurites when to stop extending and begin to maintain their axonal morphology. Identifying these stop signals and their molecular receptors may be a critical step in identifying targets for future therapies. Our work aims to identify and characterize such stop signals and their receptors. We approach this complex problem in a simple, genetically tractable model organism called *C. elegans*. *C. elegans* is a microscopic nematode with a well-characterized nervous system whose neural development is very similar to human neural development at the molecular level. Using this system, we have discovered a receptor that plays a role in termination of neural axon outgrowth. We propose experiments to understand the molecular pathway that mediates this novel function of the receptor. We will first focus on understanding the function of the previously identified upstream ligand for this receptor, and then on identifying the signaling pathway that transduces the stop signal downstream of the receptor inside the axon. We hope that these insights will lead to future therapeutics to treat nervous system injuries.