We wish to understand what makes nervous system structure robust and reproducible. One way to probe how robust a system is, is to test its response to injury, and see whether it will repair or regenerate. Understanding the underlying molecular and genetic mechanisms is essential to find out how to regenerate the damaged (e.g. spinal cord injury) or diseased nervous system (e.g. stroke, multiple sclerosis). Glial cells, neuron-glia interactions and trophic factors are thought to be key to promoting nervous system regeneration. We have established a novel injury paradigm in the Drosophila larva to use the power of genetics to investigate the underlying genetic and cellular mechanisms. We have recently discovered a gene network underlying the glial regenerative response to CNS injury using Drosophila. We are now investigating further cellular and molecular mechanisms involved in this response, and we are also collaborating with mammalian experts to directly test the relevance of our fruit-fly findings in mammals, closer to human conditions.

Selected references


