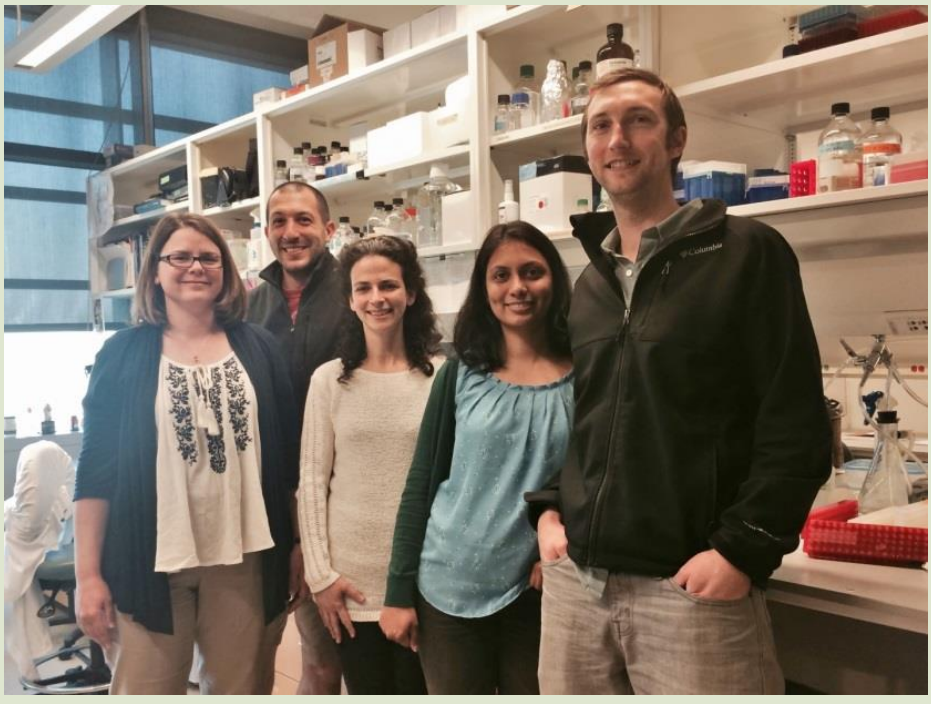
Sorting Neuronal Survival Signals

For many years, it has been known that growth factors secreted by the muscle control neuron-muscle connections and the survival of the motor neuron. Dr. Mugdha Deshpande, the Blazeman Foundation Postdoctoral Fellow for ALS Research, has been working to understand how mutations causing ALS alter the transport of these survival signals within the neuron, in Avital Rodal's lab at Brandeis University. Using fruit flies as a model, their group has shown that growth of neuron-muscle connections is compromised in flies expressing a human ALS gene. This disruption of neuron-muscle connections is associated with the loss of a molecular growth signal. Her recent work in collaboration with Zachary Feiger, a graduate student in the Rodal lab, has identified defects in the transport of growth signals as well as mitochondria (the energy factories of the cell) in diseased neurons. Recently, they have identified an effective method to reroute transport of the growth signals in the fly model, pointing them towards a set of cellular machines that might be therapeutic targets in ALS.

In parallel, Dr. Deshpande is working with Dr. Suzanne Paradis at Brandeis to develop a system to study these signals in mammalian neurons expressing the same human ALS gene, to test if there are defects comparable to those she saw in the fly model. She has found that growth of these neurons is severely affected when they are modified to express this ALS gene. Graduate student Josiah Herzog has been working with Dr. Deshpande in Dr. Paradis's lab to examine if these defects are related to problems with specific growth signals. By understanding how growth and survival signals are being diverted from their normal itinerary in diseased neurons, it will be possible to develop new therapies to return these signals to the appropriate location.



***ALS Research Group at Brandeis University**; (from left) Dr. Suzanne Paradis, Zachary Feiger, Dr. Avital Rodal, Dr. Mugdha Deshpande (Blazeman Fellow), Josiah Herzog.*