**Saunil “Sonu” Dobariya**

Synapses are a specialized form of communication previously thought to be unique to neuronal cells. When a neuron forms synapses with a non-neuronal cell, what does that mean how does it differ from a typical neuronal synapse? Neurons form glutamatergic and GABAergic synapses with the glial cell known as oligodendrocyte precursor cells (OPCs), but little is known of the synaptic properties of these non-canonical synapses and even less is known about their protein composition in mammalian models. My work focuses on characterizing these synapses at the proteomic and electrophysiological level in rodent primary cultures and tissue, assessing changes in neuron-OPC synaptic function and OPC maturation upon specific knockdown or deletion of known postsynaptic proteins in OPCs, such as AIDA-1.

**Figure Legend**

**A**: Confocal image of mixed rat neuron-glia culture stained with antibodies for NG2, postsynaptic protein SAP102, and presynaptic vesicle marker Synapsin1.

**B**: Widefield image of OPC in whole cell patch clamp configuration, identified by mScarlet3 expression.

**C**: Traces of evoked excitatory postsynaptic currents (eEPSC) in OPC recorded *in vitro*while stimulating neuronal sphere culture electrically. Blocking with NBQX and D-APV removes AMPA and NMDA currents respectively, which are re-established as drugs are washed out.