My laboratory has been interested in the cellular and molecular mechanisms that regulate oligodendrocyte development and myelination in the vertebrate central nervous system. These studies have included characterization of the precursors and progenitor cells that generate oligodendrocytes and understanding the pathways involved in oligodendrocyte precursor proliferation, migration and differentiation. In the last 10 years we have utilized the information derived from developmental paradigms to develop novel approaches to promote repair and remyelination in the adult CNS following injury or disease. These studies have led to an increase in our understanding of the interactions between the CNS and the immune system and the role of neural and non-neural cells in the development of CNS pathology and repair.

One area of emerging interest is the use of stem cells in the treatment of adult demyelinating disease such as MS. Work from our laboratory has helped develop a number of clinical trials using bone marrow derived mesenchymal stem cells (MSCs) to treat MS patients early in the disease. Ongoing studies are designed to define the molecular mechanisms mediating MSC-mediated repair as well as develop new models of CNS demyelination and remyelination that may illuminate the role of oligodendrocytes and astrocytes in myelin repair.

References

