Hope for MS sufferers rides on development of new drug therapies

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"Inducing Myelin Repair by Antagonism of Muscarinic Receptor Type-3"

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Multiple sclerosis (MS) and other serious neurological disorders are characterized by a loss of the protective myelin sheath that covers nerve fibers in the central nervous system (demyelination), leading to impairment of neurological functions. Researchers in the Jacobs School of Medicine and Biomedical Sciences are looking at a number of drug compounds that may reverse that process, leading to the repair of damaged fibers through a process of remyelination.

Oligodendrocyte progenitor cells (OPCs) are the precursors to oligodendrocyte cells which actually provide the myelin sheath. It's believed that signaling of a certain subtype of receptor in OPCs (known as Muscarinic Receptor Type-3, or, M3R) has a role in regulating the differentiation of OPCs into oligodendrocytes during remyelination. More specifically, a research team led by principal investigator Fraser J. Sim, PhD, associate professor in the Department of Pharmacology and Toxicology, hypothesizes that M3R signaling directly impairs OPC differentiation and remyelination following demyelination. If that were so, highly selective and potent M3R antagonists (drugs which block M3R signaling) would be expected to improve repair to the damaged cells while minimizing negative side effects.

Genetic approaches to specifically delete and impair M3R signaling will be tested for their effects on oligodendrocyte differentiation and remyelination in a pilot study supported by a $75,000 grant awarded by the Clinical and Translational Science Award and funded by the National Center for Advancing Translational Sciences of the National Institutes of Health under Award Number UL1TR001412.

Sim believes the data collected may establish M3R as a key receptor for future drug development of even more potent and selective compounds that target M3R activity. Rates of MS in Western New York are twice the national average, according to the National MS Society. Sim's innovative approach could one day provide relief to the more than 3,000 people in the region suffering from this debilitating disease.