Dr. Blair R. Leavitt

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Dr. Blair Leavitt is a full Professor in the Department of Medical Genetics & the Department of Medicine, Division of Neurology (Associate) at the University of British Columbia. Dr. Leavitt completed his medical degree at McGill, medical internship at Columbia-Presbyterian, and neurology residency at Cornell and Harvard. While in Boston, he completed a basic neuroscience research fellowship at Harvard Medical School and the Children's Hospital of Boston.

Blair is a consulting neurologist and Director of Research at the UBC Centre for Huntington's Disease. A scientist and physician, Dr. Leavitt's time (both clinical and research) is dedicated to developing new treatments for genetic brain disorders such as Huntington's disease. He also works on other neurodegenerative diseases, including amyotrophic lateral sclerosis and frontotemporal dementia. Dr. Leavitt is currently the Director of the CMMT Transgenic Animal Facility and a founding Editor-in-Chief of The Journal of Huntington's Disease. Dr. Leavitt previously received the HSC Navigator award in 2011, 2015, and 2021. His 2021 project titled "Design and evaluation of an epigenetic therapeutic strategy for Huntington's disease treatment" set the groundwork and mapped out the strategy used in his application this year.

Research Project Title: ***Targeted DNA methylation editing to ameliorate Huntington's disease phenotypes in human induced pluripotent stem cells***

Lay Summary: Huntington's disease (HD) is a brain disorder caused by a single, specific mutation in the DNA sequence of the huntingtin gene (HTT). This mutation produces an abnormal, toxic mutant huntingtin protein (mHTT) that causes a progressive loss of cells in the brain and leads to the development of HD symptoms. Many factors, including naturally occurring chemical modifications of DNA, impact levels of mHTT. In turn, mHTT levels affect the onset, progression, and severity of HD patient symptoms. One type of chemical DNA modification, called DNA methylation (DNAm), alters the activity of HTT in brain cells and may affect the loss of brain cells that occurs in HD. In this proposal, we will alter DNAm at HTT to selectively reduce the quantity of toxic mHTT protein produced from HTT, and we will evaluate how lowering toxic mHTT using this approach improves the health of cells carrying the HD mutation. These studies will use specialized human cells highly similar to the brain cells affected in HD, enabling accurate assessment of how altering HTT DNAm improves cellular HD symptoms. This work will increase our understanding of the impact of DNAm levels on toxic mHTT abundance and measure how altering DNAm levels at HTT improves cellular HD symptoms, and will evaluate the utility of altering DNAm as a novel approach for therapeutic mHTT lowering in HD.