Scientists deepen genetic understanding of MS

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(Medical Xpress)—Five scientists, including two from Simon Fraser University, have discovered that 30 per cent of our likelihood of developing Multiple Sclerosis (MS) can be explained by 475,806 genetic variants in our genome. Genome-wide Association Studies (GWAS) commonly screen these variants, looking for genetic links to diseases.

Corey Watson, a recent SFU doctoral graduate in biology, his thesis supervisor SFU biologist Felix Breden and three scientists in the United Kingdom have just had their findings published online in *Scientific Reports*. It's a sub-publication of the journal *Nature*.

An inflammatory disease of the central nervous system, MS is the most common neurological disorder among young adults. Canada has one of the highest MS rates in the world.

Watson and his colleagues recently helped quantify MS genetic susceptibility by taking a closer look at GWAS-identified variants in the major histocompatibility complex (MHC) region in 1,854 MS patients. The region has long been associated with MS susceptibility.

The MS patients' variants were compared to those of 5,164 controls, people without MS.

They noted that eight percent of our 30-per-cent genetic susceptibility to MS is linked to small DNA variations on chromosome 6, which have also long been associated with MS susceptibility.

The MHC encodes proteins that facilitate communication between certain cells in the immune system. Outside of the MHC, a good majority of genetic susceptibility can't be nailed down because current studies don't allow for all variants in our genome to be captured.

"Much of the liability is unaccounted for because current research methods don't enable us to fully interrogate our genome in the context of risk for MS or other diseases," says Watson.

The researchers believe that one place to look for additional genetic causes of MS may be in genes that have variants that are rare in the population. "The importance of rare gene variants in MS has been illustrated in two recent studies," notes Watson, now a postdoctoral researcher at the Mount Sinai School of Medicine in New York.

"But these variants, too, are generally poorly represented by genetic markers captured in GWAS, like the one our study was based on."

Simon Fraser University is Canada's top-ranked comprehensive university and one of the top 50 universities in the world under 50 years old. With campuses in Vancouver,

Burnaby and Surrey, B.C., SFU engages actively with the community in its research and teaching, delivers almost 150 programs to more than 30,000 students, and has more than 120,000 alumni in 130 countries.

Provided by Simon Fraser University