Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neuropsychological disorders diagnosed in any age groups. The disorder is broadly characterized by individuals who have difficulty paying attention, controlling impulse behavior, and hyperactivity (1). ADHD is known to have a strong genetic component with large scale twin studies showing heritability to be from anywhere 0.75 to 0.91 (2). It is a multifactorial disorder with many genetic components that contribute to various related phenotypes. LPHN3 is a gene with known variants expressed in ADHD patients. LPHN3, also known as ADGRL3, is apart of the latrophilin adhesion G protein-coupled receptors (GPCRs). LPHN3 is specifically important because it has been shown to be the only LPHN to almost exclusively expressed in the brain. LPHNs have an extracellular amino terminus, seven transmembrane domains, and an intracellular carboxyl terminus. Previous studies have shown strong evidence that ligand binding to adhesion GPCRs activate various downstream signaling pathways. LPHN3 mutants have been shown to reduce the density of synapses formed (3). Little is known about other negative effects due to the loss of LPHN3 function. Another disease linked to LPHN3 mutants is addiction, but it is not known whether LPHN3 mutants are a cause for addiction themselves, or if it is because they have ADHD.

My **long-term goal** is to discover how LPHN3 variants affect downstream cell signaling pathways involved with addiction.

I **hypothesize** that LPHN3 mutants’ individuals with ADHD will be at a higher risk for addiction compared to ADHD individuals with fully functioning LPHN3.

References

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