

Terra Fairbanks BSc

Personal Bio:

Terra completed her Bachelor of Science in Biology, focusing on Neuroscience, from the University of Victoria in 2022. During her undergraduate degree, she performed research on concussions and the spinal cord, fueling her interest to pursue graduate school. Following graduation, she joined the Girgis Lab at the University of Calgary to complete her Masters of Neuroscience. Throughout her masters, she plans to investigate how a novel technology, low-intensity focused ultrasound (LIFU), may be used to alter the activity of deep brain regions. Her research will contribute to the understanding of LIFU in the hopes that one day it may be used as a therapy option for movement disorders such as Parkinson's. In her spare time, she enjoys teaching dance, skiing, backpacking, and spending time outdoors.

Title of Presentation: Understanding low-intensity focused ultrasound for potential future use in the treatment of Parkinson's disease.

Synopsis of Research:

Low-intensity focused ultrasound (LIFU) is a novel, non-invasive technique that uses ultrasound to change brain activity. This non-surgical method is safe to use in humans. Studies have shown that LIFU can change brain activity of superficial parts of the brain, but it is not clear whether deep brain targets can be affected. This is important because Parkinson's disease affects deep parts of the brain, and we are looking for new ways to target these areas to improve Parkinson's symptoms.

The preliminary work is being done in healthy people before studying it in patients with Parkinson's. We are using LIFU on a deep part of the brain called the subthalamic nucleus, a part of the brain that is typically targeted during surgery for Parkinson's. We have found that LIFU causes temporary changes in function of this brain region, causing people to perform differently on a task measuring cognitive function. This is promising, as it suggests LIFU can cause a meaningful and predictable change in this region of the brain.

The next steps in this research will be to study these effects on people with Parkinson's disease before they undergo surgery. Ultimately, we hope that one day LIFU may be used as an alternative to surgery to treat Parkinson's.