Development of an Immersive Virtual Reality Model of the Immune System in Response to SARS-CoV-2 Infection using LifeBrush

Lucia Fu\textsuperscript{1,2}, Lorena Yeung\textsuperscript{3}, Vineet Kour\textsuperscript{3}, Michael Wahba\textsuperscript{4}

\textsuperscript{1}Department of Psychology, \textsuperscript{2}Department of Biological Sciences, \textsuperscript{3}Department of Chemistry, \textsuperscript{4}Department of Computer Sciences
University of Calgary 2500 University Dr NW, Calgary, AB T2N 1N4, Canada

INTRODUCTION
• Lifebrush is a virtual reality tool that allows the creation of dynamic molecular illustrations using a multi-agent system.\textsuperscript{1} It was designed to be an educational tool for use in classrooms.

METHODS
• Lifebrush is a virtual reality tool that allows the creation of dynamic molecular illustrations using a multi-agent system.\textsuperscript{1} It was designed to be an educational tool for use in classrooms.

• The aim for this project is to create a new scenario in Lifebrush. The model system chosen for this project is the human immune system.
• This project intends to set a solid foundation for future researchers to build on.
• Future researchers will have to expand Lifebrush into a diverse library of interactive educational experiences.

COVID-19
• Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a virus that is responsible for the COVID-19 pandemic.\textsuperscript{2}
• SARS-CoV-2 are enveloped, positive single-stranded RNA viruses.\textsuperscript{2}
• These viruses enter the host cell by a transmembrane spike protein and binds to the angiotensin converting enzyme 2 (ACE2) receptor.\textsuperscript{2}
• These viruses have the ability to activate the innate and adaptive immune response.\textsuperscript{3}

Fig 2. Model of SARS-CoV-2 structure created with BioRender.\textsuperscript{4}

IMMUNE SYSTEMS

Innate immunity (quick, non-specific)

Adaptive immunity (long-term, specific)

COVID-19 STIMULATION

References