CONFERENCE ABSTRACT BOOK OPEN ACCESS

University of Ottawa Healthcare Symposium (UOHS) 2020 Pitch-O-Rama: Elevator Pitch Research Competition

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Abstract
The University of Ottawa Healthcare Symposium (UOHS) is a one-day undergraduate health conference that aims to increase awareness of the interdisciplinary field of health. This conference engages students' interest in health through seminars, interactive discussions, and a research-based elevator pitch competition. UOHS was created nine years ago by undergraduate students, and it has grown to become the University of Ottawa's largest healthcare conference. Every year, UOHS hosts Pitch-O-Rama, an elevator pitch competition during one of the conference's seminar blocks. This is an event where undergraduate students have the opportunity to present their health care-related research to an audience and panel of judges in a clear and engaging way while winning prizes and certificates. The abstracts of the top three presentations at the UOHS 2020 Pitch-O-Rama are highlighted in this abstract booklet.

Keywords: cognitive behavioural therapy; common cold; Duchenne muscular dystrophy; elevator pitch competition; healthcare; pitch-o-rama; undergraduate research

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Conference Abstracts
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Top Three UOHS 2020 Pitch-O-Rama Abstracts

Genetically engineering commensal microorganisms to form a biological barrier against rhinovirus-mediated common cold infections

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The common cold is one of the most frequent - and most annoying - viral infections of the upper respiratory tract. While symptoms are usually mild, the airborne vector is still highly contagious, contributing to hundreds of millions of schooldays and workdays missed worldwide, annually. Out of all cases of the common cold, over 50% are caused by serotypes of rhinovirus, where infection is largely dependent on viral adhesion to intercellular adhesion molecule 1 (ICAM-1) receptors on the ciliated surfaces of human nasal epithelial cells. While there are some drugs and antivirals in development against rhinovirus, they are rarely seen in clinical use as they are often impractical and/or unsustainable. This research project proposes the genetic engineering of ICAM-1 receptors onto the surface of *E. coli* as a preliminary trial in determining the efficacy of a bacterial chassis in sequestering a eukaryotic virus. Synthetic biology techniques will be used to clone the proper gene into *E. coli*, flow cytometry will be used to test for ICAM-1 expression, virulence will be assessed via plaque assay, and aerosol concentrations of rhinovirus will be measured before and after passing through a "mock" nasal canal colonized by our modified *E. coli*. Finally, if the *E. coli* chassis proves to be effective in immobilizing rhinovirus particles, the same principles may be applied to highly abundant commensal microbes that live naturally in the human nasal canal. The hope is that we can ultimately create a biological barrier that protects us against the common cold.

Modulating healthy and Duchenne patient induced pluripotent stem cell-derived satellite-like cell division with Wnt7a and EGF

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Duchenne muscular dystrophy (DMD) is a skeletal muscle wasting disorder caused by dystrophin deficiency. Dystrophin is not only a structural protein but also involved in activated skeletal muscle stem cell (MuSC) polarization prior to division. Lack of dystrophin results in reduced muscle progenitors and consequently impaired tissue regeneration. Using model animals we have found that Wnt7a and EGF can modulate MuSC division dynamics and ameliorate DMD pathology by increasing MuSC expansion and commitment to tissue regeneration, respectively. This project aims to use healthy and DMD donor induced pluripotent stem cells (iPSC) differentiated into MuSC-like cells to investigate whether Wnt7a and EGF can modulate human MuSC-like progenitor cell division dynamics in the same way. We also aim to generate isogenic dystrophin-null iPSCs from healthy donor lines to identify whether any differences to Wnt7a and EGF treatment between healthy and DMD lines are specifically attributed to dystrophin deficiency. We envisage that this project will provide translational evidence for applying these therapeutic candidates to tackling DMD pathology.

Training Indigenous Elders in culturally-adapted cognitive behavioural therapy

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Suicide has become the second leading cause of death for Indigenous youth in Canada. Yet current mental health approaches have failed to adequately address this crisis because they rely on strict westernized treatment models that do not incorporate Indigenous understandings of health and healing. Additionally, the remote locations of most Indigenous communities combined with the high turnover rate of non-indigenous therapist act as barriers to the design and delivery of accessible and long-term mental healthcare programs. This research seeks to explore how cognitive-behavioural therapy (CBT), a low-risk, evidence-informed treatment approach, can be modified to create a culturally-adapted therapeutic modality to be employed by community elders in Northern, Ontario. Previous clinical studies amongst a sample of Maori Indigenous show that a culturally-adapted variant of CBT, respective of spiritual elements and collectivist values, effectively reduced participants' symptoms of anxiety and depression by as much as 90%. Another study trained non-Indigenous mental health practitioners in CBT using telepsychiatry modules which they then successfully employed to reduce depression amongst a sample of Indigenous youth in Northwestern, Ontario. This study goes beyond existing research to analyze how training community elders, as opposed to non-indigenous practitioners, in culturally-adapted CBT can better facilitate community-based healing. Elders are widely respected in most Indigenous cultures and already act as informal sources of mental health care. Therefore, it is hoped that training elders via online modules developed in collaboration with Indigenous therapists and knowledge keepers, will lead to a more accessible, culturally-appropriate therapeutic modality to improve Indigenous mental health outcomes.

Conflicts of Interest

The authors have no conflict of interest to declare.

Authors' Contributions

KWH: Co-Vice-President of Communications of the planning committee for the University of Ottawa Healthcare Symposium 2020, assisted authors with their abstract submissions, drafted the conference abstract booklet, and gave final approval of the version to be published.
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