

## The University of Ottawa Healthcare Symposium (UOHS) 2023 Pitch-O-Rama: Undergraduate Elevator Pitch Research Competition



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"Research in Earnest"

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### Abstract

The University of Ottawa Healthcare Symposium (UOHS) is an annual one-day undergraduate health conference focused on promoting interdisciplinary awareness in the field of health. Through seminars, interactive panel discussions, and a research-based elevator pitch competition, UOHS aims to engage students and foster their interest in healthcare. Founded twelve years ago by undergraduate students, UOHS has grown to become the University of Ottawa's largest healthcare conference, exemplifying its significance and impact. At the heart of UOHS is the renowned Pitch-O-Rama event, held during a seminar block, where participants have the opportunity to deliver clear and engaging elevator pitches on their healthcare-related research to an audience and panel of judges. The primary objective of the Pitch-O-Rama is to encourage students to effectively communicate and share their scientific research with the wider community. In this abstract book, we proudly present the written submissions of the top five participants, highlighting their outstanding contributions and showcasing their ability to articulate the significance of their research. For additional details about UOHS, please visit our website: <https://www.uohs-csuo.com/>.

**Keywords:** PTSD; MDMA; stem cell therapy; AF-MSC-RPE Cells; telemedicine; hypertension; NOX5; ischemia-reperfusion Injury (IRI); intracerebellar sensorimotor connectivity; fMRI

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### Conference Abstracts

Note: These abstracts have been reproduced directly from the material supplied by the authors, without editorial alteration by the staff of the URNCST Journal. Insufficiencies of preparation, grammar, spelling, style, syntax, and usage are the authors.

<sup>1</sup> The abstracts included in this booklet are provided by the authors of the top eight presenters who have granted permission for publication. The first two abstracts belong to Sabrina Dubien Bertrand and Marwan Bakr, who secured first and second place, respectively, in the Pitch-O-Rama competition. The subsequent three authors, without a specific ranking, were selected from the top eight participants based on the judging criteria.

### **Top Five UOHS 2023 Pitch-O-Rama Abstracts**

#### **Psychedelic therapy for post-traumatic stress disorder: A research study**

*Sabrina Dubien Bertrand, BSc Student [1]*

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**Introduction:** Post-traumatic stress disorder (PTSD) represents a serious disability due to its chronicity and resistance to pharmacological treatments. An advantage of using 3,4-methylenedioxy-N-methylamphetamine (MDMA) as an adjunct to psychotherapy is that beneficial effects can appear after as little as two sessions. Since sexual assault is a leading cause of PTSD diagnoses, my study focuses on women only. I hypothesized that subjects undergoing an MDMA-assisted compound psychotherapy intervention will demonstrate greater change in their PTSD scores compared to subjects in the control group.

**Methods:** This study requires the use of an experimental design with a control group to evaluate the effectiveness of the treatment. The sample would consist of 50 women diagnosed with PTSD for over a year, randomized into two experimental groups and one placebo group. Participants will undergo two sessions of the intervention, with a six-week interval in-between each session. The intervention's effects will be measured with the Clinician-Administered PTSD Scale (CAPS-5).

**Results:** The expected effect is a reduction in symptoms for both experimental groups after two sessions. To affirm the intervention's effectiveness, the CAPS-5 score will have to demonstrate a decrease of at least 30 points.

**Conclusion:** If shown to be effective, many of the participants will no longer meet the criteria for PTSD.

#### **Inhibition of T cell proliferation by mesenchymal stem cell-derived retinal pigment epithelium cells**

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**Introduction:** Stem cell-based therapies show immense promise as a viable treatment for age-related macular degeneration and have elicited positive results in animal models of retinal degeneration. Amniotic-fluid mesenchymal stem cells (AF-MSC) have been shown to be a promising candidate for retinal pigment epithelium (RPE) cell replacement. This study aims to establish the capability of AF-MSC-RPE cells to inhibit T cell proliferation.

**Methods:** PBMC cells will be cultured alone, and with AF-MSC-RPE cells and the effect on T cell proliferation will be analyzed by means of fluorescent dye dilution and flow cytometric assays. Controlled variables will include blood and stem cell donors, culture medium, incubation periods, external antibodies, and stem cell concentration.

**Conclusion:** Successful results would establish a base for further research with respect to other immunological properties of AF-MSC-RPE cells, including induction of T cell apoptosis, expression of human leukocyte antigen molecules, etc. This study, in tandem with further studies, will potentially address the need for or extent of immunosuppression therapy following clinical allotransplantation of AF-MSC-RPE cells. Unsuccessful results will nonetheless contribute to scientific knowledge in the field and will allow further research in the field to be directed toward potentially preferable stem cell therapies for AMD.

#### **Impact of telemedicine intervention on blood pressure, patient satisfaction, and adherence to treatment for hypertensive patients**

*Hamed Tavakoli Dastjerdi, BSc Student [1,2]*

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**Introduction:** Hypertension is a prevalent risk factor worldwide. Telemedicine is an approach to managing chronic diseases, particularly for patients in remote areas. This study evaluated the impact of a telemedicine intervention on hypertension management.

**Methods:** A randomized controlled trial was conducted on 50 hypertensive patients. The telemedicine group received weekly virtual consultations, while the standard care group received in-person consultations. Primary outcomes were mean systolic blood pressure, patient satisfaction, and adherence to treatment over a period of 12 weeks.

**Results:** The telemedicine group showed a lower mean systolic blood pressure (131 mmHg) than the standard care group (135 mmHg;  $p < 0.05$ ). The satisfaction rate was higher in the telemedicine group (4.5) than in the standard care group (4.0;  $p < 0.05$ ). Adherence to treatment was comparable between the two groups (78% vs. 80%).

**Conclusion:** The telemedicine intervention resulted in a lower mean systolic blood pressure and higher satisfaction rate compared to standard care for hypertension management over 12 weeks. Findings support the use of telemedicine for

managing hypertension, particularly for patients in remote areas. However, this study has some limitations, such as a small sample size and short duration. Further research is needed to evaluate the long-term effectiveness of telemedicine for hypertension management.

**Nox5 drives inflammation and renal injury in the proximal tubule following acute kidney injury: A research study**

*Emma R. Dorfman, BSc Student [1], Mayra T. Sonoda, PhD [1,2], Chet E. Holterman, PhD [2], Chris R. Kennedy, PhD [1,2]*  
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**Introduction:** The kidney is the organ responsible for removing waste products from the blood. Similarly to all other organs, it requires a constant supply of oxygen from the blood to function properly. Blood flow decreases in many instances, including severe bleeding, vomiting, diarrhoea, dehydration, and organ transplantation. In these instances, kidney function can be compromised. Upon the reintroduction of blood flow, the kidneys excessively consume the blood resulting in tissue damage called ischemia-reperfusion injury (IRI). It is hypothesized, when blood flow stops and then resumes, an enzyme called NOX5 becomes present in the kidney. Could NOX5 be causing this tissue damage? If so, how? The aim of my project is to assess kidney injury and inflammation changes when NOX5 becomes present in acute kidney injury.

**Methods:** I will do this by creating IRI in mice. I will use a clamp to decrease blood flow to their kidneys, remove the clamp to allow blood flow to resume, and then confirm NOX5 expression. Next, I will use qPCR to measure injury and inflammatory-related gene expression levels.

**Results:** These markers will point toward what pathways NOX5 affects to contribute to renal injury. I anticipate increased levels of injury and inflammatory markers, including KIM1 and interleukins, in the IRI mice when compared to the control.

**Conclusion:** This research could identify NOX5 as a drug target to reduce kidney injury following IRI.

**A functional connectivity map of the human cerebellum**

*Anthaea-Grace Patricia Dennis, HBSoc Student [1]*  
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**Introduction:** Cerebellar hypoplasia results from congenital or post-natal viral infection or a genetic mutation, leading to an underdeveloped cerebellum. Impairing this key subcortical structure in motor and nonmotor voluntary actions causes motor dysfunction, including ataxia; the functional coupling of the cerebellum and multiple sensorimotor cerebral networks is thereby affected. Using resting-state fMRI, correlational studies have mapped cerebellar lobules to cerebral cortices and yielded models of cerebral-cerebellar interactions, but the intracerebellar model is incomplete.

**Methods:** We investigated functional connectivity in the sensorimotor areas of the cerebellum using task-based (causal) and resting-state (correlational) fMRI from an existing open-source dataset. We analyzed cerebellar activity using a “winner-takes-all” approach and correlated regions of interest (ROI) and nodes to network atlases.

**Results:** We determined that connectivity between the sensorimotor regions within the cerebellum may be used to differentiate between hands and possibly predict handedness, which may contribute to treatments due to loss of function. We visualized and proposed a sensorimotor intracerebellar model using a range of platforms.

**Conclusion:** Through integrating causal and correlational fMRI data to provide a network model of intracerebellar sensorimotor connectivity, this study furthers research about the diagnosis and treatment of neurodegenerative and cerebellar diseases, including cerebellar hypoplasia.

**Media Archive**

- [Video Clips and Pictures](#) (Opening and Closing Ceremonies, Judges Panel, Top three presenters, etc.):
- Abstract Presentation Schedule and Presentation and Abstract Quick links:
  - [English Version](#)
  - [French Version](#)
- UOHS 2023 Delegate Package:
  - [English Version](#)
  - [French Version](#)

### Conflicts of Interest

The author(s) declare that they have no conflict of interests.

### Authors' Contributions

AA: directed communication between the judges and elevator pitch competition competitors, served as a planning committee for the conference and liaison author, reviewed the abstract submissions and ensured that they adhered to correct formatting standards, assisted authors with their abstract presentations, drafted the conference abstract booklet, and gave final approval of the version to be published.

AW: served as a planning committee for the conference and reviewed the abstract submissions and ensured that they adhered to correct formatting standards.

MS: directed the planning committee for the conference as co-president and gave final approval of the version to be published.

TY: directed the planning committee for the conference as co-president and gave final approval of the version to be published.

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A heartfelt thank you goes to the esteemed judges: Dr. Steve Perry, Dr. Xuhua Xia, Dr. Matthieu Delcourt, Mr. Aidan MacAdam, and Mrs. Lavleen Mader. Their expertise and discerning evaluations were instrumental in ensuring the success of the elevator pitch competition.

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