

UNIVERSITY OF ALBERTA
FACULTY OF MEDICINE & DENTISTRY

16th Annual
Department of Psychiatry
Research Day

Abstract Book

Keynote Address: **Dr . Zafiris Jeff Daskalakis**
The Future of Neuromodulation in the Treatment of Depression

May 24th, 2017
ECHA L1-490

May 24, 2017

Welcome to the 16th Annual Research Day of the Department of Psychiatry at the University of Alberta

Going into its 16th anniversary, Psychiatry Research Day 2017 showcases and celebrates recent findings from our basic and translational research programs including developments in neurochemistry, genetics, imaging, neuropsychiatry, and psychotherapy. Many of these programs involve collaborative research with colleagues from other departments and institutions locally, nationally, and internationally. Over the years, the Department of Psychiatry has developed very strong MSc and Ph.D. programs to complement our excellent residency program, with some of our residents enrolled in the MSc program. Our trainees represent our department exceedingly well by winning many national, provincial, university and faculty scholarships and awards and by disseminating their research at scientific conferences throughout the world.

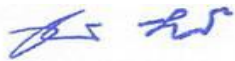
Research Day this year has a focus on non-pharmacological approaches to psychiatry, as voted upon by both the residents and graduate students. Our invited speakers cover a range of topics from this area and others, including a lived experienced presentation by Amy Willans at the start of the day, Dr. Jeff Daskalakis providing the keynote presentation at part of Psychiatry Grand Rounds at lunch, and Dr. Frank MacMaster in the afternoon. Following last year's successful format, we will again have short presentations from our graduate students including James Benoit, Jasmine Brown, Ehsan Dorri, Daniela Gomez, Michal Juhas, Rohit Lodhi, Manoj Malik, Tyler Marshall, Brad Necyk, John Paylor, Matt Reeson, Miranda Stahn, and Eszter Wendlandt. Poster presentations from our trainees and collaborators will also be presented throughout the day. The top presentations by research trainees will be acknowledged with awards.

Our keynote speaker this year is Dr. Jeff Daskalakis, of the University of Toronto. Dr. Jeff Daskalakis is a Professor of Psychiatry, Chief of the CAMH Mood and Anxiety Division and Temerty Chair in Therapeutic Brain Intervention. The Temerty center uses brain stimulation to treat severe mental illness (e.g., depression, schizophrenia and obsessive compulsive disorder) and also studies important brain mechanisms such as plasticity to understand how these treatments work. He has received several national and international awards and distinctions, he holds national and international peer-reviewed funding, he is an editor for several key journals in the field (e.g., Biological Psychiatry, Clinical Neurophysiology) and he has over 270 peer-reviewed publications. Dr. Daskalakis keynote lecture entitled, "The Future of Neuromodulation in the Treatment of Depression" will discuss his extensive work in this area and is an ideal fit for the theme of this year's event, non-pharmacological approaches to psychiatry.

We are grateful to all our research trainees and their supervisors for their contribution to the vital research in our department. Special thanks to our organizing committee: Michal Juhas and John Wesley Paylor (our graduate student representatives), Tara Checknita (heart & soul of Research Day), and Dr. Esther Fujiwara for their tireless efforts in organizing this year's Research Day.

Dr. Daskalakis' visit to our department was supported in part by the Faculty of Medicine and Dentistry via the Dean's Lecture Series and Walter Mackenzie Visiting Speaker Fund, and we are extremely grateful for this generous support. Additional thanks to Campus Alberta Neuroscience for their support of travel for other speakers. Lastly, we would like to gratefully acknowledge funding from Janssen Pharmaceutical for this important venture.

Thank you for joining us and celebrating our research accomplishments from the past year.



Xin-Min Li, MD, PhD, FRCPC
Professor and Chair, Department of Psychiatry
Faculty of Medicine and Dentistry, University of Alberta
Capital Health Chair in Mental Health Research
Special Advisor to the Dean on China Research Initiatives

ACKNOWLEDGEMENTS

The Department of Psychiatry is grateful to the following for their financial support:

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CAMPUS ALBERTA NEUROSCIENCE





16th Annual Psychiatry Research Day

Wednesday, May 24, 2017

L1-490 Edmonton Clinic Health Academy

8:15 am – 9:00 am	Coffee & Poster Set-up
9:00 am – 9:15 am	Opening Remarks by Dr. Xin-Min Li, Chair
9:15 am – 10:00 am	Guest Speaker - <i>Ms Amy Willans</i> “Proof of Hope”
10:00 am – 10:15 am	Coffee Break
10:15 am – 11:00 am	5-Minute Thesis Talks by Graduate Students <i>1. Wesley Paylor</i> <i>4. Jasmine Brown</i> <i>2. Michal Juhas</i> <i>5. Daniela Gomez</i> <i>3. James Benoit</i> <i>6. Rohit Lodhi</i>
11:00 am – 12:00 am	Poster Session
11:15 am – 12:00 am	Break for Lunch
12:00 pm – 1:00 pm	Keynote Address - <i>Dr. Zafiris Jeff Daskalakis</i> “The Future of Neuromodulation in the Treatment of Depression.”
1:00 pm – 1:15 pm	Coffee Break
1:15 pm – 2:00 pm	5-Minute Thesis Talks by Graduate Students <i>7. Manoj Malik</i> <i>10. Matt Reeson</i> <i>8. Tyler Marshall</i> <i>11. Miranda Stahn</i> <i>9. Brad Necyk</i> <i>12. Eszter Wendlandt</i>
2:00 pm – 2:30 pm	Poster Session and Coffee Break
2:30 pm – 3:30 pm	Guest Speaker - <i>Dr. Frank MacMaster</i> “Brain Stimulation – the Alberta Experience.”
3:30 pm - 4:00 pm	Student Awards Presentation and Closing Remarks by Dr. Esther Fujiwara, Graduate Program Director

5-Minute Thesis Talks by Psychiatry Graduate Students

Presenter

Title

10:15 - 11:00

- | | | |
|---|----------------------|---|
| 1 | <i>Wesley Paylor</i> | Perineuronal nets and cognitive function |
| 2 | <i>Michal Jubas</i> | Local Functional Connectivity Changes in Alcohol Use Disorder |
| 3 | <i>James Benoit</i> | Multimodal machine learning pitfalls |
| 4 | <i>Jasmine Brown</i> | Prevention of Fetal Alcohol Spectrum Disorder Through Use of Technology |
| 5 | <i>Daniela Gomez</i> | Neurocognitive Impairment Profiles in HIV infection |
| 6 | <i>Robit J Lodhi</i> | Change in patients presenting to and reasons for early drop out from an opioid dependency program |

1:15 - 2:00

- | | | |
|----|-------------------------|---|
| 7 | <i>Manoj Malik</i> | Early prediction on Alzheimer's disease using neuroimaging biomarkers |
| 8 | <i>Tyler Marshall</i> | Treatments Options, Preferences and Shared Decision Making (SDM) for Opioid Use Disorder: A Scoping Review Protocol |
| 9 | <i>Brad Necyk</i> | Exploring cancer together: art, illness, and trust |
| 10 | <i>Matt Reeson</i> | The Effect of Adverse Childhood Experiences on Epigenetics and Mental Health |
| 11 | <i>Miranda Stahn</i> | Endosomal-lysosomal Cholesterol Sequestration by U18666A Treatment Differentially Regulates APP Metabolism in Normal and APP Overexpressing Cells |
| 12 | <i>Eszter Wendlandt</i> | Myelin in Stroke: Changes in Space and Time |

POSTER PRESENTATIONS

11:00am - 12:00pm & 2:00pm - 2:30pm

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Speaker Biographies



Edmonton poet **Amy Willans** is trained to give Community Education presentations about what it is like to live with mental illness, in order to educate and inform the public. She is currently a criminology student at MacEwan University and employee of the Schizophrenia Society of Alberta. She received the 2015 Partner in Health award presented by The College and Association of Registered Nurses of Alberta (CARNA). Amy is the author of *Haunted by Blue (The Rasp and The Wine, 2014)*. Her writing has also been published in *The Globe and Mail*, *Standing Together: Women Speak Out about Violence and Abuse (Brindle and Glass, 2005)*, *Transition magazine (Canadian Mental Health Association)*, and in various anthologies and journals. In 2013, she partnered with visual artist Laurie MacFayden, in a mixed-media installation entitled *Fighting Normal*, which explores the stigma that confronts anyone who does not present as “normal” in society. In 2014, Amy was selected as a participant in The Iowa Writers’ Workshop.

Dr. Jeff Daskalakis is a Professor of Psychiatry, Chief of the CAMH Mood and Anxiety Division and Temerty Chair in Therapeutic Brain Intervention. The Temerty centre uses brain stimulation to treat severe mental illness (e.g., depression, schizophrenia and obsessive compulsive disorder) and also studies important brain mechanisms such as plasticity to understand how these treatments work. He has received several national and international awards and distinctions, he holds national and international peer-reviewed funding, he is an editor for several key journals in the field (e.g., *Biological Psychiatry*, *Clinical Neurophysiology*) and he has over 270 peer-reviewed publications.



Dr. Frank MacMaster is an Associate Professor in the Departments of Psychiatry and Pediatrics at the University of Calgary. He is also the Scientific Director of the Alberta Health Services Strategic Clinical Network for Addictions and Mental Health. As a neuroscientist working in the area of pediatric mental illness, he examines the biology of the brain and how to fight these illnesses. Currently, his work is focused on using brain stimulation, such as rTMS technology, to help children and teens affected by mental illness.

Multimodal machine learning pitfalls

James Benoit (Department of Psychiatry, University of Alberta)

Machine learning-based classification has been increasingly present in academic literature since 2009. Alongside this increase in publication presence has been an increase in determining which data are most suited to producing accurate classifiers. We have been working towards applying Python-based tools to a multimodal MRI (structural, resting state functional, task-based functional, and diffusion) dataset from a Calgary clinical trial of MDD medication (Citalopram/Seroquel) efficacy. I will be discussing a number of pitfalls (e.g. multiple scan locations, vector length, small dataset) that are worth bearing in mind when working in a multimodal machine learning context.

Presentation: Thesis Talk

Prevention of Fetal Alcohol Spectrum Disorder Through Use of Technology

Andrew Greenshaw (Department of Psychiatry, University of Alberta); Egon Jonsson (Institute of Health Economics); **Jasmine Brown** (Department of Psychiatry, University of Alberta)

Fetal alcohol spectrum disorder (FASD) is a term used to describe a range of physical and mental disabilities caused by maternal alcohol consumption during pregnancy. Fetal Alcohol Syndrome (FAS), the most severe form of FASD, is considered a leading cause of mental retardation in Canada and the United States (Abel & Sokol, 1987). It is also completely preventable. In Alberta, over 46,000 individuals currently live with FASD and approximately 700-1900 babies are born with FASD in the province each year (Nguyen, et al., 2014). The goal of this study is to see how a Mobile Alcohol Measuring (MAM) breathalyzer device (linked to a cellphone) changes alcohol consumption during pregnancy in women with alcohol dependency issues. More specifically, this study seeks to evaluate whether the ability to self-monitor blood alcohol concentration during pregnancy reduces alcohol consumption, and thus reduce the possibility of delivering a child with FASD. This is the first study of its kind.

Presentation: Thesis Talk

Lipid storage and microglial inflammation

Matthew Churchward (Department of Psychiatry & Neuroscience and Mental Health Institute, University of Alberta); Kathryn Todd (Department of Psychiatry & Neuroscience and Mental Health Institute, University of Alberta)

As the innate immune cells of the central nervous system, microglia are both essential contributors to normal development, homeostasis, and synaptic function, and primary regulators of inflammation in nervous tissue. During injury, as in ischemic stroke, microglia are uniquely capable of survival and function in environments deprived of blood flow and hence oxygen and glucose, suggesting alternate metabolic pathways to sustain functionality during nutritional deprivation. We have recently observed microglia subject to glucose deprivation are highly capable of inflammatory function, including increased phagocytic activity and release of inflammatory factors [1]. In the present study we investigate the potential for lipid stores to function in sustaining microglial activity during nutritional stress using primary cultured microglia. Inhibition of triglyceride synthesis, which decreased lipid storage in intracellular lipid droplets, was found to markedly decrease the release of inflammatory factors including cytokines (TNF, IL1B) and nitric oxide even in conditions where glucose was provided at normal levels. Further, we observed that inhibition of microglial phagocytosis caused a decrease in the accumulation of lipid droplets. These data suggest microglia may utilize lipid stores or lipid droplet-mediated signalling during normal inflammatory activation, and that stores can be continuously replenished by phagocytic intake of cellular debris to sustain these essential functions.

Presentation: Poster

Issues in determining HIV-associated neurocognitive disorders

Ehsan Dorri (Department of Psychiatry, University of Alberta); Deanna Nielsen (Department of Psychology, University of Alberta) Esther Fujiwara (Department of Psychiatry, University of Alberta)

The human immunodeficiency virus (HIV) is now a chronic condition with a life-long treatment course. Although many individuals living with HIV do well today, some will develop cognitive deficits. We know little about long-term consequences of living with HIV, especially with regard to cognitive changes. Consensus criteria from 2007 are commonly used to stage the presence and severity of HIV-associated neurocognitive disorders (HAND). However, prevalence rates for HAND, especially in milder forms, vary widely across published cohorts. There are many possible reasons for this variability, including patient sampling methods and demographic differences between cohorts. In addition to these, different rates of HAND may result from different methods used to measure neurocognition and determine deficit status, in addition to the underlying pathology. In addition, inclusion or exclusion of comorbidities varies across cohorts. This review describes and summarizes these issues. Across the reviewed cohorts, measurement issues include inconsistent application of the consensus criteria for HAND, pronounced differences in the number of neurocognitive tests and number of cognitive domains into which the tests are grouped, the presence or absence of appropriate normative reference populations, and the statistical methods of determining staging of 'impairment'. Of these, methods used to apply the criteria and those to derive cognitive status are particularly difficult to discern due to incomplete reporting. Cohorts also have variably excluded comorbidities with known impact on cognition, such that ascribing neurocognitive impairment (determined whichever way) to HIV is complicated.

Presentation: Poster

Neurocognitive Impairment Profiles in HIV infection

Daniela Gomez (Department of Psychiatry, University of Alberta); Christopher Power (Departments of Psychiatry and Medicine, University of Alberta); M. John Gill (Department of Medicine, University of Calgary); Esther Fujiwara (Department of Psychiatry, University of Alberta)

Objective: Neurocognitive impairments (NCI) persist in HIV-infected individuals despite highly active combination antiretroviral medication (ART). Neurocognitive deficits observed in ART-treated populations are subtle, and can differ between individuals. This study aimed to identify distinct patterns of NCI in an HIV-infected cohort receiving ART from the Southern Alberta Clinic via Latent Profile Analysis (LPA). Multivariate regression analyses identified related predictors for each NCI profile. Method: A total of 308 HIV-infected participants underwent multi-domain neuropsychological testing, and NCI was determined in 108 individuals using clinical rating criteria. LPA uncovered three different profiles of NCI within this subset of individuals. A multivariate Random Forest Analysis (RFA) identified predictors of profile membership. Results: We identified three groups: mild NCI (mNCI, n= 93), attention/executive function impairment (ATT/EF; n= 26), and severe overall impairment (Global; n= 29). Important predictors differentiating mNCI from ATT/EF included: age, birth country, depressive symptoms, employment status, years of education, recent CD4, diabetes, and ART side-effects. Predictors differentiating mNCI from the Global profile were: birth country, gender, depressive symptoms, employment, years of education, HIV duration, nadir and recent CD4, CPE, psychiatric conditions, and diabetes. Conclusion: Three distinct profiles of NCI were identified within a large HIV-infected cohort. RFA results revealed that, although most predictors overlapped, age and ART side-effects uniquely predicted attention/executive dysfunctions. Gender, psychiatric co-morbidities, and HIV duration uniquely distinguished the global deficit group from the mildly impaired. RFA on ATT/EF and Global, the most impaired subgroups, was underpowered such that potential differences between these two should be studied further.

Presentation: Thesis Talk & Poster

Local Functional Connectivity Changes in Alcohol Use Disorder

Michal Juhas (Department of Psychiatry, University of Alberta), Matthew Brown (Department of Psychiatry, University of Alberta), Marnie MacKay (Department of Psychiatry, University of Alberta), James Benoit (Department of Psychiatry, University of Alberta), Timothy Gillese (Alberta Health Services), Ericson Dametto (Department of Psychiatry, University of Alberta), Allan Aubry (Alberta Health Services), Glenn Walmsley (Alberta Health Services), Blayne Blackburn (Alberta Health Services), Cindy King (Alberta Health Services), Liana Urichuk (Alberta Health Services), Mark Loowell (Alberta Health Services), Wolfgang Sommer (Department of Addictive Behaviour & Addiction Medicine, Central Institute of Mental Health, University of Heidelberg; Department of Psychopharmacology, Central Institute of Mental Health, University of Heidelberg); Serdard Dursun (Department of Psychiatry, University of Alberta), Andrew Greenshaw (Department of Psychiatry, University of Alberta)

Alcohol use disorder is associated with widespread structural brain atrophy as well as impaired brain function during both task-based and resting state functional brain imaging studies. This study focused on local functional connectivity changes in recently detoxified chronic alcohol dependent patients (n=56) compared to matched healthy controls (n=50). The patients have exhibited significantly decreased regional homogeneity as well as the amplitude low frequency fluctuations in resting state functional magnetic resonance imaging signal in deep gray matter regions including putamen and globus pallidus. These changes might help to elucidate underlying functional abnormalities which might be associated with broader functional network changes previously documented in alcohol use disorder patients. Limitations of our study include broad age-range of participants, multi-site data collection using different magnetic resonance imaging scanners, and inclusion of only adult male participants.

Presentation: Thesis Talk

Mental Health Survey of Fort McMurray Residents Following the 2016 Wildfire

Vincent Agyapong (Department of Psychiatry, University of Alberta); **Michal Juhas** (Department of Psychiatry, University of Alberta); Matthew Brown (Department of Psychiatry, University of Alberta); Idowu Akinjise (Alberta Health Services; Department of Family Medicine, University of Alberta); Edward Denga (Alberta Health Services; Department of Family Medicine, University of Alberta); Bernard Nwaka (Alberta Health Services; Department of Family Medicine, University of Alberta); Joy Omeje (Alberta Health Services), Pierre Chue (Alberta Health Services; Department of Psychiatry, University of Alberta); Sandra Corbett (Alberta Health Services); Andrew Greenshaw (Department of Psychiatry, University of Alberta); Xin-Min Li (Department of Psychiatry, University of Alberta)

2016 Fort McMurray Wildfire was the largest documented natural disaster in Alberta's history, displacing over 90 thousand individuals and destroying over two thousand homes as well as approximately 1.5 million acres of land. Victims of natural disasters have been documented around the world to suffer from elevated risks of mental health problems both in the short as well as the long term after the disaster. Our team has surveyed over five hundred respondents in Fort McMurray (age range 17-88 with approximately 66% female) six months after the wildfire disaster to document the prevalence rates and correlated risk factors for probable post-traumatic stress disorder, generalized anxiety disorder, major depressive disorder, and alcohol use disorder among the wildfire survivors. 19.7% of respondents suffered from probable generalized anxiety disorder, 14.8% from probable major depressive disorder, 14.2% from probable alcohol use disorder, and 12.8% from probable post-traumatic stress disorder. A range of demographic and clinical antecedents were associated with increased risk for reporting likely mental health disorders. These include among others, prior history of mental health complications, extent of property damage, level of received support, counseling during the disaster, and occupation status after the wildfire. Respondents with probable mental health diagnoses were more likely to abuse drugs, more likely to have reported increased drug use following the disaster, and also be more likely nicotine dependent. This is the first study to our knowledge to document the impact of the 2016 Fort McMurray Wildfire on the mental health of the survivors.

Presentation: Poster

Identifying Cognitive Differences Following Exposure to Nature or Urban Scenes

Jonathan W.P. Kuziek (Department of Psychology, University of Alberta); Kyle E. Mathewson (Department of Psychology, University of Alberta; Neuroscience and Mental Health Institute, University of Alberta)

Many aspects of our environment place demands on our attention but these constant demands can fatigue and limit our ability to maintain focus. Studies suggest that attentional fatigue recovery is improved by being exposed to inherently fascinating environments. Natural environments are such an example and show an attentional benefit compared to urban, man-made environments. The P3 component of an event related potential (ERP) has been shown to be modulated by attentional demands and the goal of the current research was to understand the effects of nature and urban scene exposure in relation to the magnitude of the P3 response.

Participants completed an auditory oddball task while viewing images of nature scenes, urban scenes, or blank images. Following the presentation of each image, either a rare high-pitched tone or a more-frequent low-pitched tone was played. Participants were required to press a button each time a high tone was played and withhold responses to low tones. Electroencephalogram (EEG) data was recorded to derive ERPs to each tone, with the P3 response typically observed after presentation of the high tone.

Contrary to our predictions, we did not observe significant differences in the P3 response while viewing either nature or urban scenes. However, differences in earlier ERP components were observed along with differences in ERP activity following the presentation of the images themselves. These results suggest that scene viewing may not modulate P3 magnitude, despite the P3 being influenced by attentional demands and nature scenes having been shown to facilitate recovery from fatigue.

Presentation: Poster

Change in patients presenting to and reasons for early drop out from an opioid dependency program

Rohit J. Lodhi; Avininder Singh Aulakh; Roshan Hegde; Tanis Pangburn; Russ Griener; Katherine J. Aitchison

Background: We wish to explore change in profile of patients at an ODP in Edmonton and reasons for early disengagement.

Objectives: 1. To evaluate change in demographic and clinical profiles of patients attending the ODP over 10 years 2. To highlight differentiating characteristics between early drop outs and adequately engaging subjects

Methods: The Opioid Dependence Program ODP in Edmonton collects intake data on the attendees in electronically using the 'ASIST' program. Data extraction from files of participants who attended from January 2005 to November 2016 will be conducted (approximately 2000 new intakes). Trends in profile composition will be highlighted. Duration of service utilization for each subject will be used to compare early drop-outs and those who remain.

Results: Ethics (Pro00066759) and procedural approvals have been obtained and we are currently planning the data extraction for this study.

Conclusions: Identification of change in composition of the ODP may inform set up of appropriate services, while identification of those who drop out early may lead to interventions to improve engagement, and hence reduce morbidity and potential mortality.

Presentation: Thesis Talk

Early Prediction of Alzheimer's Disease Using Neuroimaging Biomarkers

Manoj Malik (Department of Psychiatry, University of Alberta); Ericson Dametto (Department of Psychiatry, University of Alberta); Michal Juhas (Department of Psychiatry, University of Alberta); Matthew Brown (Department of Psychiatry, University of Alberta); Andrew Greenshaw (Department of Psychiatry, University of Alberta)

Alzheimer's disease (AD) is the most prevalent form of dementia, which mostly affects older people. AD proceeds through a prodromal stage known as Mild Cognitive Impairment (MCI), which is considered as a transitional stage between normal healthy ageing and AD. Recent studies indicate that the global cost of AD and dementia is approx. \$605 billion and the dementia prevalence will be around 115.4 million by 2050. At present, the diagnosis of AD is based on the clinical observations and cognitive testing but the definitive diagnosis can only be confirmed by histopathological examination of the brain tissue. In addition, none of the drugs available in the market work significantly in AD, this may be due to extensive damage that arises in the brain before clinical symptoms appear. However, early therapeutic interventions, particularly from the MCI stage, can halt or delay the onset of AD as suggested by previous studies. Nevertheless, the diagnosis of the MCI is quite challenging and the false negative error rate is high. Furthermore, up to 40% of normal ageing individuals possess AD like neuropathological symptoms and mislead proper diagnosis. Therefore, my project is mainly focused on two hypotheses: (i) Identifying a refined neuroanatomic structure(s) which may enable us to correctly distinguish normal aging from MCI and AD by using all neuroimaging modalities with an accuracy of >95%. (ii) Early prediction and diagnosis of AD particularly from MCI stage by using all established neuroimaging biomarkers.

Presentation: Thesis Talk

Treatments Options, Preferences and Shared Decision Making (SDM) for Opioid Use Disorder: A Scoping Review Protocol

Tyler Marshall, MPH (Department of Psychiatry, University of Alberta); Sunita Vohra (Department of Psychiatry, University of Alberta)

Background - Opioid use disorder (OUD) is characterized as a widespread chronic disease with significant public health, social and personal costs in North America. OUD has a heterogeneous bio-psycho-social etiology that requires complex treatments paradigms – both pharmacological and non-pharmacological. Presenting patients with treatment options, and involving them in clinical decision making has shown to improve outcomes in chronic disease patients. This concept is known as shared decision making (SDM), which may also improve various quantitative and qualitative outcomes in OUD.

Aim - This scoping review aims to: 1) overview of treatment options in OUD, 2) evaluate patient preferences for OUD treatment, 3) explore barriers and facilitators of SDM for OUD treatment, 4) explore limitations in current research, and 5) develop a protocol for an in-depth follow-up systematic review.

Methods - This review will follow Joanna Briggs Institute methodology guidance for scoping reviews. Five databases and the grey literature will be searched systematically. Patients at any age with an OUD diagnosis, and both quantitative and qualitative literature will be included. Case reports, case series, editorials, and animal studies will be excluded. The review will evaluate OUD treatment from various healthcare settings.

Presentation: Thesis Talk & Poster

Alexithymia and eye-tracking of visual attention to ambiguous emotional faces

Mursal Mohamud* (Department of Psychology, University of Alberta); **Gunvir Sidhu*** (Department of Psychology, University of Alberta); Areej Kisana (Department of Psychology, University of Alberta); Alex. K. Macrae-Korobkov (Department of Neuroscience and Mental Health Institute, University of Alberta); Esther Fujiwara (Department of Psychiatry, University of Alberta)

*co-presenters

Alexithymia is a personality trait characterized by difficulties with identifying and describing emotions in one-self and others. Alexithymia is usually assessed with a questionnaire, most commonly the Toronto Alexithymia Scale (TAS). Asking people who have difficulties with their emotions to report on such difficulties in a questionnaire is problematic and more objective emotion processing measures may be useful. Our lab recently found people with high alexithymia (HA) attended relatively less to the eye region of faces showing mixed emotional expressions, compared to people with low alexithymia (LA). Importantly, eye-preference reduced performance accuracy in HA while it increased performance in LA. The current study is a follow-up experiment with a few critical changes: Trial numbers are 2.5 times higher, maximally ambiguous faces (showing 50% of two emotions) and neutral faces are included, and the face photos were enlarged to allow more precise eye-movement measures within different facial areas of interest (like eyes, mouth, nose, etc.). Subjects were undergraduate student participants selected to be HA or LA. Preliminary analyses showed that participants are less accurate and take longer when they judge ambiguous faces (25%, 50%, 75% of one emotion), as opposed to clear faces (100% one emotion). We expect to further replicate our previous findings, including the reduction in eye-preference in HA. Furthermore, we will test if neutral faces are particularly difficult to judge and show the strongest reduction of an eye-preference for HA.

Presentation: Poster

Exploring cancer together: art, illness, and trust

Brad Necyk (Department of Psychiatry, University of Alberta)

For me, this project was about trust. This trust has allowed my work to discuss difficult topics around trauma and the self. I learned from our patient sessions that head and neck cancer was not something that you get past or a battle you can win; nor can you refer to yourself as a survivor. These people fight a never-ending battle. From the traumatic event of diagnosis and rupture of the continuum that defines one's whole self, through to the tests, scans, waiting rooms, radiation, chemotherapy, surgeries, reconstruction, physiotherapy, prosthetics, more waiting rooms, and, for some, the eventual return of cancer... there is no point past this possibility but only a field of illness states. These states are not neatly fitted in a binary of healthy or dead, but rather in a continual state of 'doing-illness': bodily discipline, support networks, constant engagement with health systems, and, for some, a new relation between themselves and illness—an integration, an acceptance. However, the way of being is dramatically unmoored. There were large lifestyle changes such as the inability to work and maintain relationships, but there were also more intimate changes such as in the way your body moves, and how one speaks, and eats. Throughout this state of 'doing illness', the traumatic event of diagnosis, treatment, and recovery remains and persists as a dizzying dislocation of the self in relation to one's own body. Rooted in the level of trust formed between project participants, these were the tough narratives that were shared by the patients and that I found my artwork was able to explore.

Presentation: Thesis Talk

Perineuronal nets and cognitive function

John Wesley Paylor (Department of Psychiatry, University of Alberta); Brittney Lins (Department of Physiology, University of Saskatchewan); Wendie Marks (Department of Physiology, University of Saskatchewan); Nadine Zabder (Department of Physiology, University of Saskatchewan); Quentin Greba (Department of Physiology, University of Saskatchewan); John Howland (Department of Physiology, University of Saskatchewan); Ian Winship (Department of Psychiatry, University of Alberta)

Perineuronal nets are components of the extracellular matrix which are crucial to the regulation of neural plasticity. These structures are lost in the prefrontal cortex of patients suffering from schizophrenia and our group has recently replicated this in a prominent animal model of the disorder. Unfortunately, the significance of the loss of PNNs and the regulation of plasticity in schizophrenia is not well understood. Our current work investigates direct perineuronal net degradation in the prefrontal cortex of rodents. We have found that PNN degradation results in the manifestation of several schizophrenia-like symptoms and perturbs the local cellular environment.

Presentation: Thesis Talk & Poster

No jittering with Latte Panda, comparing EEG data collection methods on the road to mobilization

Eden Redman (Department of Psychology, University of Alberta); Graeme Splinter (Department of Psychology, University of Alberta); Jonathan W.P. Kuziek (Department of Psychology, University of Alberta); Kyle E. Mathewson (Department of Psychology, University of Alberta /Neuroscience and Mental Health Institute, University of Alberta)

Electroencephalography (EEG) is typically conducted in a highly controlled laboratory setting. However, this limits the generalizability of results to real-world situations. Previous research has shown that alternative, more portable means of stimulus presentation have yielded results comparable to traditional methods and may allow for more mobile EEG experimentation.

By comparison, EEG data collection typically relies on the use of desktop or laptop PCs. To further increase the portability of EEG experiments, we are exploring the use of a Latte Panda, a compact and relatively inexpensive Windows PC board, in the collection of EEG data. To assess data quality between a Latte Panda and Windows laptop, we are comparing the P3 and MMN waveforms elicited during an auditory oddball task. In this task, participants listen to either high-pitched or low-pitched tones and must press a button each time a high tone is presented, with low tones being played 80% of the time and high tones only 20%. The MMN waveform is a negative deflection following the presentation of the rare tone whereas the P3 waveform is a positive deflection following the rare tone.

Currently, results suggest that EEG data collection is comparable between the laptop and Latte Panda even though some differences exist between both conditions. Further analysis will help to explain these differences but our results suggest that the Latte Panda can serve as a reliable replacement to a laptop regarding EEG data collection. Such results will allow for more portable, and affordable, EEG experimentation.

Presentation: Poster

The Effect of Adverse Childhood Experiences on Epigenetics and Mental Health

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Adverse Childhood Experiences (ACEs) are known as risk factors for the development of mental illness. At present, there is no definitive mechanism for how early-life stress can induce physiological changes to the brain. Epigenetics, however, is an emerging field that attempts to mediate the interplay between genes and environment, and it has been proposed as a potential mechanism for the induction of mental illness in individuals with a history of ACEs.

My thesis intends to monitor and assess the progression of the symptomatology of mental illness in youth inpatients from around the city. Participants have been asked to fill out questionnaires both during treatment, and after discharge, from inpatient services. The results from these questionnaires will be compared to each individual's ACE score - as determined by the ACE questionnaire filled out upon admission. I hypothesize that individuals with higher ACE scores are more likely to develop treatment-resistant mental illness and, as such, will have a blunted reduction in their mental health symptoms.

An extension of this study would include quantitative data pertaining to epigenetic changes in individuals with high ACE scores in order to determine if particular epigenetic markers, coupled with knowledge of ACEs, can help health professionals better predict individual outcomes to treatment. If correct, this research could be paramount into developing a better understanding of the factors underlying mental illness, as well how best to treat these maladies.

Presentation: Thesis Talk & Poster

Food for sleep: Examining the effects of increased lactate availability on slow wave states

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The brain relies on oxidative metabolism to support ongoing processes. With an increase in neural activity, astrocytes engage in glycolysis to produce lactate, which diffuses out into the extracellular space and is readily taken up by neurons, providing neurons with their preferred energy source. This system may become especially useful during sleep when the brain is regularly engaging in high energy state alternations between slow wave sleep (SWS) and rapid eye movement (REM) sleep. Indeed, substrates of oxidative metabolism have been shown to decline during SWS compared to REM sleep and waking states. Based on this, we wanted to examine how augmenting metabolic resources might influence neural activity. Here we show that administering lactate systemically evokes an increase in slow-wave states in urethane anesthetized rats, in a dose dependent fashion. Previously we have shown that increases in blood oxygen content promotes slow wave states in both natural sleep and urethane anesthesia. Together, our findings suggest that a bias towards oxidative metabolism promote slow-wave states. In addition to identifying a more causal relationship between metabolism and brain states, our findings suggest simple but novel ways to increase the amount and quality of slow wave sleep, which could help individuals with cognitive problems associated with aging, obesity and diabetes, which have all been linked with decreased and/or disrupted SWS.

Presentation: Poster

Endosomal-lysosomal Cholesterol Sequestration by U18666A Treatment Differentially Regulates APP Metabolism in Normal and APP Overexpressing Cells

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Amyloid β ($A\beta$) peptide derived from amyloid precursor protein (APP) plays a critical role in the development of Alzheimer's disease (AD). Current evidence indicates that altered levels/subcellular distribution of cholesterol can regulate $A\beta$ production/clearance, but it remains unclear how cholesterol sequestration within the endosomal-lysosomal (EL) system can influence APP metabolism. In the present study, we evaluated the effects of U18666A, which triggers redistribution of cholesterol within EL system, on mouse N2a cells expressing different levels of APP in the presence or absence of extracellular cholesterol/lipids provided by fetal bovine serum (FBS). Our results revealed that U18666A and FBS differentially increased the levels of APP and its cleaved products α -/ β -C-terminal fragments (CTFs) in mouse N2a cells expressing normal levels of mouse APP (N2awt) or higher levels of human wildtype APP (APPwt) or the "Swedish" mutant APP (APPsw). Our results also revealed that U18666A enhanced η -CTF levels in all three cells types. The cellular levels of $A\beta$ 1-40 were markedly increased in U18666A-treated APPwt and APPsw cells, while secretory levels of $A\beta$ 1-40 decreased in all three cell lines. U18666A treatment was found to trigger an increase of cell surface APP at all FBS conditions. Our studies further demonstrated that APP and its cleaved products are partly accumulated in the lysosomes possibly due to decreased clearance. Finally, we show that serum delipidation attenuated levels of APP-CTFs, but not APP, observed following U18666A treatment. These results raise the possibility that enhanced levels/alterd distribution of cholesterol may differentially regulate APP metabolism in sporadic vs familial AD.

Presentation: Thesis Talk & Poster

Alexithymia impairs speeded emotional face recognition: Role of eye movements

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Alexithymia is a personality trait characterized by difficulties in expressing or perceiving emotions. Although not a disorder, alexithymia is comorbid with many psychiatric and medical conditions, such as depression, disordered eating, and autism spectrum disorder. A handful of studies have explored visual attention underlying emotional face processing in alexithymia, but these have either included clinical cohorts where alexithymia was a control variable (e.g., alexithymia in eating disorders), or healthy individuals whose alexithymia scores were outside the clinically meaningful ranges. Based on this research, emotional face processing deficits in alexithymia are most likely when recognising the emotion is difficult such as in speeded tasks. We recorded eye-tracking during speeded emotional face processing in healthy people with clinically elevated (or low) alexithymia scores. A total of 182 low alexithymic [94 LA] or high alexithymic [88 HA] undergraduate participants were enrolled via clinical cut-off scores in the Toronto Alexithymia Scale [TAS]. Compared to LA, HA were less accurate, especially for trials with faces showing surprise. Furthermore, HA showed less of a viewing preference for the eye region of faces compared to LA, especially for faces showing sadness. Although performance and eye-preference in this task were lower in HA, they were unrelated.

Presentation: Poster

Myelin in Stroke: Changes in Space and Time

Eszter Wendlandt (Department of Psychiatry, University of Alberta); Ian Winship (Department of Psychiatry, University of Alberta)

Ischemic stroke induces widespread pathophysiology including axonal degeneration and demyelination. While demyelination is thought to contribute to the functional impairment that follows stroke, the temporal profile of de- and re-myelination following stroke is not well described, and their relation to cortical network impairment and recovery is not defined. Here, we used a novel in vivo imaging approach (S_{Co}Re microscopy) to visualize myelin changes in the peri-infarct cortex of mice for 6 weeks following targeted photothrombosis of the forelimb somatosensory cortex. De- and re-myelination were compared to functional remapping of the fore- and hind-limb somatosensory representations visualized via longitudinal optical imaging. Demyelination was evident and severe in superficial cortical layers proximal and distal to the ischemic core by 1 day post-stroke, with significant recovery of intact myelinated structures visible by day 7 in the distal regions and by day 14 in the proximal regions. Remyelination was highly correlated with functional remapping of the forelimb and hindlimb sensory cortices, confirming a role for myelin integrity in network function and recover following stroke. Future studies will focus on the use of S_{Co}RE microscopy and functional imaging to evaluate controlled manipulations of myelin integrity and better define the role of myelin in stroke recovery.

Presentation: Thesis Talk

Teacher-Child Relationship Quality and Children's Internalizing Problems Across Preschool

Brenna Zatto (Department of Psychology, University of Alberta); Wendy L. G. Hoglund (Department of Psychology, University of Alberta)

Entrance into preschool can be an exciting experience for some children. However, children with high levels of internalizing problems (depression, anxiety, somatization) can have difficulties with this transition (Olson & Rosenblum, 1998; Sabol & Pianta, 2012). The teacher is a central figure in the preschool environment (Denham et al., 2012); the quality of the relationship between child and teacher may play a role in children's internalizing problems (Sabol & Pianta, 2012). Conversely, research shows children with high levels of internalizing problems often experience more negative relationships with teachers (Hamre & Pianta, 2001). Overall, there are mixed findings on the directional association between teacher-child relationship quality and children's internalizing problems. Therefore, the primary goal of this study is to test three conceptual models of directional association between teacher-child relationship quality and children's internalizing problems. The relationship-driven model tests the hypothesis that teacher-child relationship quality at school entry predicts children's internalizing problems across preschool. The child-driven model tests whether children's internalizing problems at school entry predict later teacher-child relationship quality. The transactional model hypothesizes the association is bidirectional. Gender differences in the directional associations are also tested. Participants included 435 ethnically diverse children in high-needs preschools; assessments occurred in the fall and spring of preschool. Teacher-reports (STRS; Pianta, 2001) and observations (inCLASS; Downer et al., 2011) were used to measure teacher-child relationship quality. Teachers reported on children's internalizing problems (BASC-II; Reynolds & Kamphaus, 2004). Results will offer better understanding of the association between teacher-child relationship quality and children's internalizing problems across preschool.

Presentation: Poster