

Event Summary: 2017 CAN-BIND Annual Workshop



Top left: 2017 workshop in session. **Bottom left:** CAN-BIND trainees and researchers share results with workshop guests. **Right:** Workshop attendees gather for the welcome and networking reception.

Event Overview

- A welcome and networking reception was held on Thursday, January 26th, 2017 to kick-off the event.
- The workshop was held on Friday, January 27th, 2017 at Double Tree by Hilton Hotel in downtown Toronto, Ontario.
- This was the largest CAN-BIND Annual Workshop to date with over 150 attendees including trainees, study coordinators, researchers, community advisors, industry representatives, and international science advisors.

Welcome Session

- Dr. Tom Mikkelsen, Ontario Brain Institute (OBI) President & Scientific Director, gave opening remarks. He provided an overview of OBI's five existing Integrated Discovery Programs (IDPs) and mentioned new directions, including a program in traumatic brain injury (TBI) that will be launched shortly. He also provided an update on IDP renewal applications for 2018-2024, which are currently being reviewed by external referees, and will subsequently be reviewed by OBI's Scientific Advisory Council (SAC), Industry Advisory Council (IAC) and Patient Advisory Committee (PAC). The review process will include opportunities to build on reviewer feedback.
- Dr. Sidney Kennedy, CAN-BIND Principal Investigator, provided an update on program milestones and achievements. Notably, CAN-BIND-1 study data collection was completed in December 2016. Many expansion studies in biomarker discovery have been launched in the last year, including interventions such as cognitive behavioural therapy and brain stimulation. Research themes identified for the renewal application aim to build on existing achievements, strengthen national and international partnerships, and increase impact on health policy.

Clinical Outcomes Symposium

- This symposium was chaired by Dr. Barbara Sahakian from the University of Cambridge (CAN-BIND Scientific Innovation Team member).
- Drs. Raymond Lam and Roumen Milev, Clinical Outcomes Platform Co-Leads, provided an overview of platform progress and future plans:
 - In 2016, a methodology paper on the CAN-BIND-1 study and a paper on the validation of the Depression Inventory Development (DID) scale were published.
 - A major goal of the platform is to identify a refined panel of clinical assessments to use in future studies based on CAN-BIND-1 results.
 - CAN-BIND has two wellness monitoring studies. These include the CAN-BIND-1 Long-term Follow-up Study and the Wellness Study. The latter is being carried out in collaboration with Janssen and involves the use of mobile health technologies.
 - Future directions include further integration with mobile health and reverse translation platforms and expanding investigations to related populations and additional interventions.
 - Knowledge translation efforts are ongoing, including development of a lay version of the CANMAT treatment guidelines for depression.
- Clinical data-driven presentations were as follows:
 - Childhood Maltreatment and Response to Escitalopram – Dr. Kate Harkness
 - Personality Traits Interact to Predict Severity of Depressive Symptoms – Dr. Timothy Allen
 - Cognitive Predictors of Response to Treatment – Dr. Shane McInerney

Neuroimaging & EEG Symposium

- This session was chaired by Dr. Helen Mayberg from Emory University (CAN-BIND Scientific Innovation Team member).
- Dr. Stephen Strother, Neuroimaging Platform Co-Lead, provided an overview of platform progress and future plans:
 - The platform has made significant progress on QA/QC pipelines. This is a labour intensive but worthwhile effort that will help to minimize multi-site effects and ensure a high quality dataset.
 - Other achievements include volumetric analysis of brain structures, and behavioural analysis of faces conflict task data.
 - Future plans include integrative analysis within CAN-BIND and also with ONDRI, OBI's neurodegeneration research program.
- Dr. Stefanie Hassel presented on hippocampal and amygdala volume in adult with depression. Results included integrative analysis with clinical data on childhood maltreatment. Upcoming analyses will include inflammatory marker data.
- Dr. Faranak Farzan, EEG Platform Lead, provided an overview of platform progress and future plans:
 - Significant progress has been made in EEG data cleaning.

- A subset of EEG data has been integrated with cognition data from the clinical platform.
- A guideline for multi-site EEG studies has been developed, and a MATLAB toolbox for EEG preprocessing has been produced.
- Several publications are in preparation and/or submission.
- Future plans include integration with other modalities, incorporation of EEG into new studies, and development of novel neuromodulation therapies.

Poster Presentation Session

- A total of 37 posters were presented by CAN-BIND trainees and researchers. The posters covered the following themes: clinical outcomes; neuroimaging and EEG; molecular; preclinical and reverse translation; knowledge translation, outreach and mobile health. A complete list of poster titles and presenters can be found in Appendix 1.

Knowledge Translation & Outreach Symposium

- This symposium was chaired by Dr. Sagar Parikh and Mr. Andrew Kcomt, Co-Chairs of the CAN-BIND Community Advisory Committee (CAC).
- Dr. Parikh, Knowledge Translation Platform Lead, provided an overview of platform progress and future plans:
 - Principles of the platform include engaging multiple audiences, partnering with persons with lived experience, using novel tools for dissemination, aiming for users to ‘pull-in’.
 - Examples of CAN-BIND KT initiatives include professional education initiatives, public education events, social media presence including lay animated videos hosted on YouTube, and establishment of the CAC.
- Three members of the CAN-BIND CAC, Ms. Terry Palmer, Ms. Carolyn Kennedy and Ms. Lucie Langford, participated in a panel discussion moderated by Mr. Andrew Kcomt. They shared their personal experiences as CAC members, and how participating on the committee has brought a sense of hope. The open discussion touched on how to increase awareness and support for mental illnesses, how to reduce stigma, and the importance of increasing knowledge about depression research. Real people sharing stories about their personal experiences, engaging with audiences through social media, and continuing to developing research and community partnerships, were highlighted as worthwhile strategies to pursue moving forward.

Molecular Symposium

- This session was chaired by Dr. Ronald Duman from Yale School of Medicine (CAN-BIND Scientific Innovation Team member).
- Dr. Jane Foster provided an overview of platform progress and future plans:
 - Biospecimen samples donated by Lundbeck (over 2700 total, including plasma, RNA and DNA), have been analyzed, and several manuscripts are currently under review by Lundbeck. Multiple articles have already been published from this data.
 - The platform is moving forward with analysis strategy for CAN-BIND-1 samples.

- Future goals include identification of novel biomarkers, discovery of novel targets for drug discovery, and integration across platforms.
- Dr. Juan Pablo Lopez presented on microRNAs as mediators of antidepressant response based on results from the Lundbeck data. The CAN-BIND team has identified microRNAs that regulate the MAPK/WNT pathway genes as mediators of antidepressant response. Results were replicated in a CAN-BIND-1 sub-cohort and in zebrafish models. A publication on these results is in press in *Nature Communications*.
- Dr. Igor Jurisica presented on opportunities for integrative analysis in precision medicine, and described preliminary integrated network analysis results from the Lundbeck data using tools developed by his team.

Preclinical and Reverse Translation Symposium

- This session was chaired by Dr. Trevor Robbins from the University of Cambridge (CAN-BIND Scientific Innovation Team member).
- Dr. Francesco Leri provided an overview of platform progress and future plans:
 - 11 publications to date with additional papers in submission.
 - The platform is aligned with the CAN-BIND-1 clinical study protocol, which allows for reverse translation between the clinical study and animal models.
 - Future directions include producing a KT platform paper, and expanding to additional research areas such as drug discovery, early life stressors and epigenetic mechanisms of microbiota to brain signaling.
- Dr. Pierre Blier presented on “Potentiation of 5-HT_{1A} Transmission by Escitalopram and Aripiprazole”. Researchers in his group are performing reverse translation studies with the CAN-BIND-1 antidepressant medications in rat models using electrophysiology.
- Dr. Xiao-Yan Wen presented on a reverse translation strategy involving zebrafish models for antidepressant drug discovery linked with miRNAs identified by CAN-BIND molecular platform researchers.

Collaborative Studies Symposium

- This session was chaired by Dr. Madhukar Trivedi from UT Southwestern (CAN-BIND Scientific Innovation Team member). The session highlighted new research themes and collaborations.
- Dr. Claudio Soares, lead of the Mobile Health, Innovation and Technology Platform, presented on m-health, wellness and digital phenotyping. CAN-BIND has an ongoing feasibility study of the HealthRhythms mobile application. This application which pairs clinical expertise with technology and leverages passive data collection to improve mental health care. The platform’s longer term goals are to expand digital phenotyping and incorporate m-health tools into future CAN-BIND studies. Mobile technologies will also be explored as vehicles for KT and engagement.
- Dr. Gerald McKinley presented on “Indigenous outreach: knowledge translation as community outreach”. He is working in partnership with First Nations communities to develop suicide prevention and wellness programs for youth.

- Dr. Robert Levitan presented on the preliminary collaboration between CAN-BIND and the Maternal Adversity, Vulnerability and Neurodevelopment (MAVAN) project. Similar measures have been collected by both groups across early developmental and adult populations. The MAVAN population includes 550 children recruited prenatally and includes genetic, epigenetic, and neuroimaging data.
- Dr. Glenda MacQueen presented on the IMAGINE-SPOR Chronic Disease Network and preliminary collaborations with CAN-BIND. The Inflammation, Microbiome, and Alimentation: Gastro-Intestinal and Neuropsychiatric Effects (IMAGINE) multisite program plans to harmonize data collection with CAN-BIND-1 where possible.

Feedback, Discussion and Closing Remarks

- This session was chaired by Dr. David Kupfer, distinguished guest and advisor.
- Advisors acknowledged the CAN-BIND program's progress over the past year, the breadth and uniqueness of program, and urged researchers to move quickly with integrative analyses.
- Advisors also commended the high-level of engagement and active participation of workshop attendees throughout the day, including community advisors.
- Advisors encouraged the CAN-BIND network to continue measuring impact and to share CAN-BIND's story with an international audience.
- OBI will be collating discussion items and feedback from appointed advisors, and will be developing a benchmarks document to guide research program progress and future plans.

Thank you to all attendees of the 2017 CAN-BIND Annual Workshop, and all members of the CAN-BIND network for continued program support.

Appendix 1: 2017 CAN-BIND Annual Workshop Poster Presentations

CLINICAL:

#	Presenter	Title
1	Allen, Timothy	Personality Traits Interact to Predict Severity of Depressive Symptoms
2	Braun Janzen, Thenille	Examining the Effects of Music and Rhythmic Sensory Stimulation on Major Depressive Disorder: Preliminary Pilot Results
3	Ceniti, Amanda	Identifying reward-based markers of risk for depression and suicidality following mild traumatic brain injury
4	Cunningham, Simone	Preliminary results for CAN-BIND-4: Endophenotypes within anhedonia and MDD
5	Edgar, Nicole	Pain, reward, attention and neurocircuitry: Biological markers of suicide
6	Fan, Yingchen	Major Depression and Inflammatory Cytokines
7	Mazurka, Raegan	Relation of Clinical and Demographic Characteristics to Blunted and Heightened Cortisol Responsivity to a Psychosocial Stressor: Preliminary Analyses from CAN-BIND-4
8	Price, Rae	CAN-BIND 1 Clinical Data Monitoring Process and Source Data Verification Results
9	Quilty, Lena Quilty and Rudolf Uher	Clinical and Biological Predictors of Cognitive Behavioural Therapy for Depression
10	Rubino, Cristina	Levels of physical activity and depression severity in CAN-BIND-1
11	Slyepchenko, Anastasiya	A comparison between subjective and objective measures of biological rhythms
12	Slyepchenko, Anastasiya	Objective and subjective differences in biological rhythms in major depressive and bipolar disorder
13	Squires, Scott	Childhood Maltreatment and Escitalopram Treatment Response: Preliminary Analysis of CAN-BIND-1
14	Wallace, Caroline	The Efficacy, Safety, and Tolerability of Probiotics on Depressive Symptoms: Preliminary Results

NEUROIMAGING/EGG:

#	Presenter	Title
15	Alders, Gesine	Defining the Nature of Emotional Conflict Task Performance in Individuals with Major Depressive Disorder and Healthy Controls
16	Chemparathy, Aditi	Intersite MRI Resolution and Stability Differences Revealed by Phantom-based Resting-State fMRI Scans
17	Hassel, Stefanie	Assessing hippocampal and amygdala volume in adult patients with depression: Preliminary Findings from CAN-BIND
18	Sharma, Gulshan	Assessing test-retest reliability of an emotional conflict task using functional magnetic resonance imaging (fMRI) data

MOLECULAR:

#	Presenter	Title
19	Belzeaux, Raoul	A combined biomarker to predict suicide ideation during antidepressant treatment
20	Fiori, Laura	Assessment of peripheral gene and microRNA expression levels in major depressive disorder and their relationship to antidepressant treatment response
21	Horne, Rachel	The Determination of Host Genetics Effects on the Gut Microbiome Through the Production of Host microRNA
22	Ju, Chelsey	Evaluating DNA methylation as a peripheral biomarker for major depressive disorder and antidepressant therapy response
23	Lin, Rixing	Small Nucleolar RNA and Antidepressant Response
24	Maciukiewicz, Margaret	Possible association between COMT and DRD2 variants and cognition in depression
25	Marshe, Victoria	Genome-wide polygenic risk score prediction of duloxetine and placebo response in major depressive disorder

PRECLINICAL & REVERSE TRANSLATION:

#	Presenter	Title
26	Bahna, Sarra	Altered stress reactivity to immune challenge in mice deficient of T lymphocytes
27	Ebrahimzade Sarvestani, Mohammad	Effect of combining aripiprazole with escitalopram on serotonergic and noradrenergic neurotransmission in the rat hippocampus
28	Fernandes, Maria Fernanda	The effects of dietary linoleic and α -linolenic acid on brain lipid metabolism and depression-like behavior in Sprague-Dawley rats
29	Horman, Thomas	Exploring the Aversive Properties of Impaired Glucose Metabolism in laboratory rats
30	Hudson, Roger	Does aripiprazole enhance the effect of escitalopram on hedonic functions and associated central gene expression in rats?
31	Narasimhan, Vijay	Zebrafish Reverse Translation Models for Major Depressive Disorders (MDD)
32	Schuman, Brock	Fishing for novel antidepressants with CAN-BIND

KNOWLEDGE TRANSLATION, OUTREACH, & MOBILE HEALTH:

#	Presenter	Title
33	Fonseka, Trehani	Strengthening the Voice of Indigenous Youth: A Community Outreach Event for Overcoming Depression and Suicide
34	Kagan, Adam	The Knowledge Translation Canvas: A New KT Tool Created By CAN-BIND, And Its Pilot Use
35	Lalovic, Aleksandra	M-Health in Depression: A pilot study to assess the user-friendliness and acceptability of a mobile health application
36	Parikh, Sagar	Integration of Lived Experience in CAN-BIND: the Evolution of Knowledge Translation via the Community Advisory Committee
37	Parikh, Sagar	CAN-BIND Public Education on Depression, Biomarkers, and More: Design, Impact and Lessons Learned

INFORMATIONAL:

#	Presenter	Title
38	Behan, Brendan	OBI Brain-CODE Booth