2nd Biennial Winter Institute

March 6 - 9, 2013
The Banff Centre
Banff, Alberta, Canada

This collaborative event is presented by:
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**Support**

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NeuroDevNet is funded by the Networks of Centres of Excellence.

Dr. Ilina Singh’s visit from the UK is sponsored by the British Consulate-General Montreal.
Welcome from the conference chairs

Dear Participants to the Winter Institute,

It is a great pleasure to welcome you to the second biennial Winter Institute held in the beautiful setting of The Banff Centre in the heart of the Canadian Rockies! We are looking forward to an exciting and stimulating meeting together with close to 100 participants from a variety of research disciplines involved in neurodevelopmental disorders research. The Autism Research Training (ART) Program, NeuroDevNet, and the Sinneave Family Foundation are proud to host this event which will gather bright young researchers together with Canadian and American academic leaders in their fields as well as other stakeholders in the neurodevelopmental disorders community.

The conference program is designed to actively engage participants in interactive learning opportunities, through guest lectures, expert panels, and breakout discussion groups, while also making time for social activities and networking. A diverse scientific program has been prepared, covering a broad range of exciting topics such as genetics, diagnostic classification systems, therapeutics, sleep disorders, mental health and ethical issues in neurodevelopmental research. We are privileged to have a number of community practitioners and advocates participate in the final two days when we hold a special community engagement event that attempts to support exchange of knowledge and perspectives among stakeholders including researchers, trainees, families, and community advocates.

We would like to take a moment and thank our insightful and dedicated planning committee for their incredible work. The success of this meeting also goes to all the individuals who contributed an enormous amount of behind-the-scene administrative help and support and to whom we are extremely grateful. We especially thank Ms. Melanie Viau for her tireless efforts to make the Winter Institute an enjoyable and rewarding experience.

Enjoy the Institute! While attending the meeting, we hope that you will take advantage of the long afternoon break to explore the city of Banff and enjoy the many outdoor activities the surrounding has to offer. Please don’t forget to give us feedback after the meeting (see the evaluation form in your conference material) about your experience so that we improve each year.

Margaret Clarke  
Senior Vice-President of Policy and Programs  
Sinneave Family Foundation

Dan Goldowitz  
Scientific Director  
NeuroDevNet

Lonnie Zwaigenbaum  
Program Director  
Autism Research Training Program
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## Conference program preview

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<td>8:00 – 8:45</td>
<td>Conference registration</td>
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<td>8:45 – 9:00</td>
<td>Welcoming remarks</td>
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<td>8:45 – 9:00</td>
<td>Dr. Margaret Clarke, Sinneave Family Foundation; Dr. Lonnie</td>
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<td>Zwaigenbaum, Autism Research Training (ART) Program; Dr. Daniel</td>
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<td>Goldowitz, NeuroDevNet</td>
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<td>9:00 – 10:15</td>
<td>Autism Genetics Update</td>
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<td>Dr. Edwin Cook Jr., University of Illinois at Chicago</td>
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<td>10:15 – 10:30</td>
<td>Refreshment break (Kinnear Centre 2nd floor Galleria)</td>
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<td>10:30 – 12:15</td>
<td>Panel: How can biomarkers support early identification and</td>
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<td>Anagnostou, Holland Bloorview Kids Rehabilitation Hospital; Dr.</td>
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<td>Mayada Elsabbagh, McGill University; Dr. Melissa Carter, The</td>
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<td>Hospital for Sick Children; Dr. Iлина Singh, London School of</td>
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<td>Economics and Political Science</td>
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<td>Dr. Susan Swedo, NIMH</td>
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<td>13:30 – 15:30</td>
<td>Does FASD (Fetal Alcohol Spectrum Disorder) or ND-PAE (Neurobehavioral</td>
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<td>Disorder due to Prenatal Alcohol Exposure) belong in the DSM V?</td>
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<td>Benefits and Risks</td>
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<td>13:30 – 15:30</td>
<td>Dr. Gail Andrew, University of Alberta</td>
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<td>DSM 5 and Autism: The Good, the Bad, and the Unknown for</td>
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<td>those of us on the autism spectrum</td>
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<td>Mr. Chris McIntosh, Victoria, BC</td>
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<td>15:30 – 16:00</td>
<td>Refreshment break (Kinnear Centre 2nd floor Galleria)</td>
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<td>16:00 – 17:30</td>
<td>Speed Networking Activity</td>
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<td>17:30 – 19:30</td>
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<td>Breakfast – Vistas Dinning Room (Sally Borden Building)</td>
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<td>8:45 – 10:15</td>
<td><strong>Breakout groups – Research Management and Professional Skills</strong></td>
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<td>Effective mentorship</td>
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<td>Dr. Jacob Burack, McGill University</td>
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<td>Dr. Elizabeth Kelley, Queen’s University</td>
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<td>Dr. Pat Mirenda, University of British Columbia</td>
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<td>Interdisciplinary collaboration</td>
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<td>Dr. Jonathan Weiss, York University</td>
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<td>Dr. David Nicholas, University of Calgary</td>
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<td><strong>Novel behavioral and computer-based Therapeutics</strong></td>
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<td>Elizabeth Kelley, Rosaria Furlano, Layla Hall, Queen’s University</td>
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<td>“Using an Adaptive, Non-Violent Videogame to Improve Attention and Executive Functioning in Adolescents with ASD”</td>
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<td>Shannon Johnson, Laura Goodman, Dalhousie University</td>
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<td>“A Metacognitive Training Program for High-Functioning Adolescents with ASD”</td>
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<td>Kimberly Kerns, Jennifer MacSween</td>
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<td>“Implementing Computerized Training for Cognitive Deficits in Children with Fetal Alcohol Spectrum Disorder”</td>
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<td>Evdokia Anagnostou, Tabitha Chiu, University of Toronto</td>
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<td>“Anxiety Meter: Physiological Detection and Management of Anxiety in Autism Spectrum Disorders”</td>
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<td>Independent activities / no refreshment break / dinner on own</td>
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<td>8:45 –10:15</td>
<td>Empirical ethics and stakeholder engagement in child development research - perspectives from ADHD research. Dr. Ilina Singh, London School of Economics and Political Science</td>
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<td>Refreshment break (Kinnear Centre 2\textsuperscript{nd} floor Galleria)</td>
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<td>Sleep disorders as a commonality to neurodevelopmental disorders</td>
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<td>How mouse models, genomics, and new technologies can inform our understanding of sleep and the pathological consequences of disrupted sleep</td>
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<td>Dr. Bruce O’Hara, University of Kentucky</td>
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<td>Waking Up to the Consequences of Inadequate Sleep in Children</td>
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<td>Dr. Penny Corkum, Dalhousie University</td>
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<td>Mental health co-morbidities in neurodevelopmental disorders</td>
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<td>Mental health problems in youth with ASD: A review of the literature and considerations for future research</td>
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<td>Dr. Jonathan Weiss, York University</td>
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<td>Mental Health Issues in Fetal Alcohol Spectrum Disorder</td>
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<td>Dr. Gail Andrew, University of Alberta</td>
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<td>The need to be flexible. Implementing the new from bench to practice. And you mentioned Resources?</td>
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<td>Dr. William Mahoney, McMaster University</td>
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<td>Community Engagement Event – breakout discussion groups</td>
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<td>Extracurricular Brain Games activity</td>
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<td>Community Engagement Event – large group discussion</td>
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<td>Strategies for advancing genetic discovery in neuropsychiatric disorders through systematic study of phenotypes. Dr. Russell Schachar, The Hospital for Sick Children</td>
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Autism Genetics update

Dr. Edwin Cook Jr., University of Illinois at Chicago
Wednesday March 6, 2013
9:00 am to 10:15 am
KC203
Chair: Dr. Lonnie Zwaigenbaum, University of Alberta

Data on autism spectrum disorder (ASD) heritability will be reviewed with reinterpretation of part of the heritability being genetic but not necessarily inherited. Such language represents an acknowledgement of the relatively large contribution of de novo variation originally implicated by microscopically visible chromosomal disorders and most recently implicated by copy number variation (CNV) and single nucleotide variation (SNV). Data continuing to support a contribution of inherited variation will be reviewed and an attempt will be made to synthesize the de novo rare variant approach with the inherited variant approach. Complexity will remain a theme in “autisms” genetic research with illustrations of variable expression and penetrance. A fundamental question is whether there are ASD causal variants and what that term means (and doesn’t mean). Variable expression often includes other forms of developmental psychopathology and opportunities for increasing our knowledge about overlapping genetic susceptibility will be introduced with a goal of stimulating discussion (and research) by the conference participants. Finally, the impact of ASD genetics on treatment development will be reviewed.

Suggested readings:


Neurodevelopmental disorders in DSM-5: What’s changing, What’s staying the same?

Dr. Susan E. Swedo, NIMH
Wednesday March 6, 2013
13:30 pm to 15:30 pm
KC203
Chair: Dr. Lonnie Zwaigenbaum, University of Alberta

Neurodevelopmental disorders (ND) have their onset in infancy or early childhood and cause life-long impairments in cognitive and behavioral functions. Diagnostic criteria for these disorders must be sensitive to age and developmental stage, as symptom expression frequently changes as children grow and develop, and the criteria also must be sensitive to male:female and cultural differences in symptom manifestations. In addition, the diagnostic criteria must serve adult patients, in whom early childhood histories may be lacking, while retaining diagnostic integrity by requiring evidence of onset in infancy or early childhood. The ND Workgroup was charged with considering all of these factors as they deliberated over recommendations for changes that would improve diagnostic sensitivity and specificity for the ND diagnostic criteria and text descriptions in DSM-5. The presentation will review briefly the procedures and process utilized by the ND Workgroup and then present the draft recommendations for autism spectrum disorder (ASD), intellectual disability (or intellectual developmental disorder), specific learning disorders (SLD), and communication disorders, including social communication disorder (SCD). The focus of the presentation will be the impact of changes recommended for the ASD diagnostic criteria, addressing questions about the proposed changes to the core symptom domains of social and communication deficits and repetitive behaviors/fixated interests; as well as the impact of developmental factors and intellectual disabilities on the clinical presentation of ASD; gender, cultural and lifespan issues in diagnosis and consideration of the autism "spectrum" -- how broad is it and what separates "normality" from disability?

KEYWORDS: ASD, DSM-5, diagnostic criteria, intellectual disability, social communication disorder.
FASD is a common neurobehavioral disability (9.1 per 1000 live births) with lifelong impairments, recognized in the literature since 1968. Many health care professionals do not have sufficient knowledge of FASD. Training about FASD diagnosis, intervention and prevention is not incorporated into basic curriculum in many faculties. Studies have shown that 90% of individuals diagnosed with FASD will have mental health/Psychiatric disorders, so it is imperative that Mental Health professionals have an understanding of FASD. Lack of recognition of FASD in DSM IV may be contributing. FASD was briefly in the DSM III under causes of mental retardation. In DSM V FASD in the Appendix as ND-PAE and will have further study. This change in terminology will add confusion as all the current clinical and research literature on FASD uses the umbrella term of FASD, under which are the categories from the terminology designated by the Institute of Medicine in 1996. The new term does directly link to etiology by stating “due to prenatal alcohol exposure” and this implies the need to confirm the history of alcohol exposure from a reliable source, which can be a challenge but essential.

The impact of alcohol on fetal brain is known from animal research and clinical studies including neuroimaging with evidence of organic brain damage. The clinical presentation of the brain damage can be in neurological hard or soft signs, motor skill and sensory deficits, cognition, learning difficulties, memory deficits, attention regulation, executive functions and adaptive function. This requires a trained multidisciplinary team to assess the individual’s function according to current guidelines (Canadian 2005 and US CDC 2004) and with standardized tools such as the 4 Digit Code model from the University of Washington. There is the danger of over diagnosis if the “Neurobehavioral Disorder” in the DSM V in not defined by this rigorous approach. Accurate diagnosis is essential for prevalence studies and to monitor the impact of costly public health prevention efforts as FASD is theoretically preventable, unlike other conditions in the DSM. Accurate diagnosis is necessary in further research on interventions.
There are multiple purposes of any diagnosis. A diagnosis serves to correctly identify and discriminate between various challenges people face. It can serve to inform and give understanding. A correct diagnosis guides courses of treatment and therapy. Often a diagnosis entitles people to services. In many cases a diagnosis gives people with that diagnosis a sense of community and identity. It separates the significant elements of a condition from symptoms that may be present but might not be material. How well will the DSM 5 meet these purposes? Will the addition of Social Communication Disorder help or hurt our understanding of autism? Chris will give his own thoughts and some of the thoughts he is aware of that the wider autism community has regarding these questions. He will give his views on whether the DSM 5 gets at the essential nature of autism. He will also give his thoughts on how the DSM 5 might impact individuals trying to get assessed as adults, whether it will impact the difficulties women face getting assessed, how it might impact the understanding society has of the autism spectrum, and how it might impact our ability to gain employment and integrate with society.
Empirical ethics and stakeholder engagement in child development research – perspectives from ADHD research

Dr. Ilina Singh, London School of Economics and Political Science
Friday March 8, 2013
8:45 am to 10:15 am
KC203
Chair: Dr. Judy Illles, University of British Columbia

The use of stimulant drugs to treat Attention Deficit/Hyperactivity Disorder (ADHD) has been a hotly debated issue for decades. A wide range of stakeholders has contributed to these debates, but there has been no systematic research effort to investigate the perspectives of children. This talk reports on findings from the Wellcome Trust-funded VOICES study (Voices on Identity, Childhood, Ethics & Stimulants: Children join the debate). Using a mixed-methods, empirical ethics approach, we interviewed over 150 young people, ages 9-14, in the US and the UK to examine their perspectives on ADHD-type behaviors; drug and non-drug interventions; and moral concerns such as personal responsibility, authenticity and moral agency. I will describe two distinctive ecological niches (Bronfenbrenner, 1979) found in the study: a performance niche and a conduct niche. Niche conditions make a difference to how children perceive and enact ADHD behaviors; how they experience the effects of medication; and how they conceptualize ‘good’ and ‘bad’ behavior. Across both niches there was little empirical evidence that stimulant drug treatment plays a negative role in individual moral development; in fact, stimulant drug treatment is valued by children because it supports aspects of their moral agency. However, children’s reports identify broader ethical concerns. Two of these will be described: children’s experience of a lack of substantive engagement with medical professionals responsible for their care; and the neglect of environmental risk factors when treating children from socially disadvantaged backgrounds.

The VOICES study has limitations in that the sample is small and not randomized. Nevertheless the findings demonstrate the importance of children’s perspectives on behavioral and mental health for academic research, clinical services and public policy.

References


* VOICES academic publications and report are available at www.adhdvoices.com. The film, ADHD and Me, is here: http://www.youtube.com/watch?v=yyaVKvuEBkk
How mouse models, genomics, and new technologies can inform our understanding of sleep and the pathological consequences of disrupted sleep

Dr. Bruce O’Hara, University of Kentucky

A lack of sleep is known to impair alertness, reaction times, cognitive skills, athletic performance and may even increase one’s level of grumpiness. However, it is still unclear what sleep actually does for the brain or why we need to sleep at all. Sleep is generally considered to be of-the-brain, by-the-brain, and for-the-brain given that there are no documented aspects of sleep in other cells or organs of the body. An understanding of what functions sleep actually performs for neurons, or the brain, or the entire body, may help us improve sleep quality, the functional roles of sleep, and perhaps ameliorate negative consequences of pathological or disrupted sleep.

The mouse has become the mammalian model of choice, especially in understanding the molecular and genetic influences on physiology and behavior. In the area of sleep research, mice are being used to find genes and gene alleles that influence a wide variety of sleep traits ranging from the timing of sleep, sleep consolidation, sleep intensity, and total amounts of sleep. Some of these genes may help us understand the basic functions of sleep or at least better understand the regulation of sleep to help those with sleep problems. The past ten years have begun to provide several examples of such success, including a better appreciation regarding the role of circadian clock genes not only in regulating preferred sleep times, but also in regulating possible physiological functions of sleep.

The mouse has also been useful in investigating sleep problems in various disease states including Alzheimer’s Disease, Parkinson’s Disease, Traumatic Brain Injury, Obesity, Diabetes, Stroke, and acute and chronic drug use (and abuse) especially alcohol. Hopefully, this can be done in mouse models of Autism as well. In all of these studies, a major limitation has been the time and expense of traditional EEG monitoring, and therefore, we have spent considerable time in developing simpler, non-invasive methods of sleep determination, and this is allowing for more rapid progress. Similar advances in technology now allow for much cheaper and regular assessments of human sleep as well, which may allow for more appropriate and better targeted interventions.

Waking Up to the Consequences of Inadequate Sleep in Children

Dr. Penny Corkum, Dalhousie University

In 2006, insufficient sleep in children was declared a public health concern by an international pediatric task force. Increasingly later bedtimes, with unchanged school start times, has led to a decrease in children’s total sleep
duration. Moreover, sleep problems are highly prevalent, with 25% of children experiencing sleep difficulties. This prevalence rate skyrockets up to 80% for children who have neurodevelopmental disorders. There is mounting evidence suggesting dramatic negative consequences of inadequate sleep, including decreased physiological, cognitive, and emotional functioning, as well as decreased quality of life for children and their families. This presentation will begin by summarizing the literature on children’s sleep and the impact of insufficient sleep. Following this, the results of four studies from our research laboratory will be shared. In the first study we experimentally manipulated sleep in children and examined the outcome on their attention, memory, and emotions. In the second study we examined the impact of stimulant medication on sleep in children with ADHD and the resulting daytime consequences. In the third and fourth studies we evaluated the efficacy of behavioural sleep interventions for typically developing children, children with ADHD and children with Autism Spectrum Disorder. The presentation will conclude with the identification of research gaps in terms of our knowledge regarding sleep in children with neurodevelopmental disorders.

Keywords: Sleep, impact of sleep problems, treatment of sleep problems

Selected readings:


Mental health co-morbidities in neurodevelopmental disorders
Friday March 8, 2013
13:30 pm to 15:30 pm
KC203
Chair: Tracy Vaillancourt, McMaster University

**Mental health problems in youth with ASD: A review of the literature and considerations for future research**

Dr. Jonathan Weiss, York University

A large proportion of people with Autism Spectrum Disorders (ASD) experience mental health problems across the lifespan, including around anxiety, depression, and anger. There has been an increasing recognition of the tremendous cost associated with mental health problems in this population, and a need for evidence-based interventions. This talk reviews recent evidence for rates of emotional and behavioural problems in children and adolescents with ASD, correlates of psychopathology, and interventions related to mental health problems for some youth with ASD. I also highlight the gaps in the literature to date and where additional research is needed, particularly in the areas of how we conceptualize mental health problems and the limited degree of research on interventions.

Keywords: Autism Spectrum Disorders, mental health, assessment, intervention

Suggested readings:

**Mental Health Issues in Fetal Alcohol Spectrum Disorder**

Dr. Gail Andrew, University of Alberta

Prenatal alcohol exposure (PAE) is a risk factor for brain damage in the developing fetus. Potential for damage depends on many factors: timing, duration and amount of exposure, exposure to other teratogens, maternal factors such as nutrition, genetics and epigenetics, stress and fetal genetic and epigenetic factors. In post natal life, children with prenatal exposure to alcohol are at risk for maltreatment including neglect and exposure to domestic violence, multiple caregivers and placement moves and not accessing appropriate
stimulation. All these factors can have a deleterious impact on brain development in the early critical years. This can compound the brain already damaged by prenatal alcohol.

Mental health comorbidity rates in FASD are 87 to 92% and are often the presenting symptoms. There is a question whether the mental health issues are a direct result of the alcohol exposure, a primary disability or may result from adverse life experiences and be preventable by protective factors in the environment. Animal models of PAE have provided data in controlled environments (Weinberg). Recent clinical research from the Glenrose FASD Research team, affiliated with the University of Alberta and NeuroDevNet will be presented (Rasmussen and Pei). Future research on models of early diagnosis and FASD focused interventions is needed.

Elevated rates of different mental health conditions have been reported including: ADHD, ODD, Conduct Disorder, Depression, Anxiety, Bipolar disorder, Tourettes, RAD, and PTSD. Impairment in social function and communication in FASD has raised overlap with Autism. Substance abuse is high in FASD, with genetic factors needing to be considered along with lack of inhibition from frontal lobe damage from PAE. Mental health conditions are difficult to manage in FASD. Cognitive behavioral therapy is limited because of basic brain impairments. Medications have unpredictable responses in FASD and there are limited RCT studies. There are many opportunities for research with a prevention focus.

Selected reading:

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The need to be flexible. Implementing the new from bench to practice. And you mentioned Resources?

Dr. William Mahoney, McMaster University

Developmental and behavioural conditions affect at least 15% of children. There are significant challenges in bringing research information and findings to daily practice. Using some examples in the fields of language and learning disorders, this presentation will identify some of the current challenges in the field. Situations where it is difficult to effect change will be discussed.
Strategies for advancing genetic discovery in neuropsychiatric disorders through systematic study of phenotypes.

Dr. Russell Schachar, The Hospital for Sick Children
Saturday March 9, 2013
10:30 am to 11:45 am
KC203
Chair: Dr. Lonnie Zwaigenbaum, University of Alberta

This presentation will advocate for a reinvigorated interest in neuropsychiatric phenotypes, an interest that has dissipated over the last few decades with the ascendency of technological approaches to the study of mental illness. This shift to technology has been particularly marked in the field of psychiatric genetics. Heritability of the most common neuropsychiatric disorders (NPD) of childhood such as autism, obsessive-compulsive disorder (OCD) and attention deficit hyperactivity disorder (ADHD) are high indicating strong genetic influences on these disorders. Despite progress in genetic methods, there has been far less progress in identifying genetic risks in these neuropsychiatric disorders than in various medical conditions of apparently comparable complexity. Collectively, molecular studies account for a small proportion of the estimated heritability in these disorders. What accounts for this “missing heritability” and what strategies will help us find it? Some of this missing heritability might be found through with the application of advanced genetic methods such as whole-genome sequencing. However, the complexity, vagueness and easy misspecification of neuropsychiatric phenotypes are very likely contributing to the low power of genetic studies. Novel phenotype approaches are presented that could advance gene discovery by increasing the power of genetic studies. Potential strategies focus on enhancing the reliability and validity of behavioral measures, developments in methods for extracting phenotypes from existing data and on identification of genetically valid and informative behavioral subphenotypes and cognitive endophenotypes. Novel phenomic strategies will be required for future studies of neuropsychiatric disorders if we are to capitalize on the potential of modern genetics for early disease detection, specification of disease mechanisms and discovery of targeted interventions. Development of these strategies will require collaboration among clinical science, genetics, behavioral genetics, psychology and bioinformatics.
Bibliographical notes

Anagnostou, Evdokia

Dr. Evdokia Anagnostou is a child Neurologist and clinician scientist at Bloorview Research Institute. Dr. Anagnostou’s research focuses on the psychopharmacology and neuroimaging of autism. Dr. Anagnostou is principal or co-investigator on multiple clinical trials in autism and has had extensive funding in both pharmacology and neuroimaging. She co-edited the Manual for the Treatment of Autism published by APPI Press in 2007. Her research at Bloorview Kids Rehab focuses on the development of clinical trials to test novel compounds for the treatment of autism and related disorders. In collaboration with imaging researchers at SickKids, she is also studying the developmental trajectory of abnormalities in the frontostriatal circuitry in autism, and exploring the mechanisms of treatment response and side effects generation using fMRI, MR spectroscopy and DTI techniques.

Andrew, Gail

Dr. Gail Andrew, BSc, MDCM, FRCPC, received university training at McGill and Pediatrics at the Montreal Children’s Hospital. She did a research Fellowship in Neonatology at the University of Alberta and subsequently developed interest in Neurobehavioral Disorders, with or without known risk factors, including complications of prematurity, prenatal teratogen exposure and impact of adverse environments. She is currently Site lead of Pediatrics at the Glenrose Rehabilitation Hospital in Edmonton, affiliated with the University of Alberta Department of Pediatrics where she is Clinical Professor. Gail is Medical Director of Glenrose FASD Clinical and Research Services with Dr. Carmen Rasmussen as research lead. The GRHFASD research team has explored the neurobehavioral profile in FASD, neuroimaging studies, interventions and as part of NeuroDevNet FASD Project biological studies in Saccadic eye movements, cortisol and genetic/epigenetic factors. Gail is a founding Board member of the Canada FASD Research Network and continues to work in the FASD Diagnosis Network. Gail is appointed external expert to the Alberta Government Cross Ministry Committee on FASD that oversees the strategic plan for FASD in Alberta. She is the Chair of the Research and KT committee of the Canadian Network of Child and Youth Rehabilitation, under the Canadian Association of Pediatric Health Centers. This role involves engaging with researchers in various aspects of Neuromotor/developmental disabilities and bridging research to practices and policies. Training of professionals about FASD is a thrust of her academic work, funded by Alberta Center for Child, Family and Community Research. Gail was recognized for FASD advocacy with a Queen Elizabeth II Diamond Jubilee Medal in 2011.

Burack, Jacob

Jacob A. (Jake) Burack, Ph. D. is Professor of School/Applied Developmental Psychology and Human Development at McGill University. He is the founder and director of the McGill Youth Study Team (MYST), is a researcher at Hôpital Rivière-des-Prairies, and is a co-investigator on the CIHR-funded National Network on Aboriginal Mental Health Research and Autism Research Training program. The empirical work by his students and him during the past 2 decades has been funded by the Social Sciences and Humanities Research Council and is focused on the development of attention and perception among persons with autism spectrum disorders (ASD) and Down syndrome. In addition to their empirical work, Jake and his students write extensively about the essential application of theories and methodologies from developmental psychology to the study of persons with ASD and other developmental disorder. In a secondary area of research, Jake and the MYST members study the role of cultural identity in First Nations communities in northern Quebec.

The most recent of Jake’s co-edited books include Burack, Hodapp, Iarocci, and Zigler’s (2012) Oxford handbook of intellectual disability and development (Oxford University Press); Burack, Enns and Fox’s (2012) Cognitive neuroscience, development , and psychopathology: Typical and atypical developmental trajectories (Oxford University Press); and Burack and Schmidt’s (in press) Cultural and contextual perspectives on developmental risk and well-being (Cambridge University Press). Jake is the editor of the book series, Development at risk, published by Oxford University Press. He is a member of the advisory boards of both the Postdoctoral and Merck Doctoral Program on Research in Mental Retardation at the University of Wisconsin, the international scientific advisory board of the Shalva Center for Mentally and Physically Challenged Children in Israel, and and is a member of the editorial boards of Development and Psychopathology and the Journal of Intellectual Disability Research.
Carter, Melissa

Melissa Carter, M.Sc., M.D., is currently a staff Clinical Geneticist at The Hospital for Sick Children, and Assistant Professor of Pediatrics at the University of Toronto. She completed residency in Medical Genetics at the Children's Hospital of Eastern Ontario in Ottawa in 2009, then a clinical fellowship in Developmental Pediatrics at Holland-Bloorview Kids Rehabilitation Hospital in Toronto. Her clinical interests include care of children with genetic developmental disabilities (in particular chromosomal disorders and Rett syndrome). Research interests include delineation of new syndromes associated with recurrent copy number variants, in particular those associated with autism spectrum disorder. She established Ontario’s first Autism Genetics Clinic in October 2011.

Cook, Ed

Ed Cook attended Southern Methodist University and the University of Texas Medical Branch at Galveston. He trained in Adult and Child and Adolescent Psychiatry at the University of Chicago. After graduation, he continued to train and eventually became a Professor at the University of Chicago. He moved to the University of Illinois at Chicago in 2005.

Ed is now the Director of the Center for Neurodevelopmental Disorders and Earl M. Bane Professor of Psychiatry at the University of Illinois College of Medicine. His program of research focuses on genetics, neurochemistry, and development of new pharmacological treatments of autism. He has assessed and treated children, adolescents and adults with autism for over 25 years, including maintaining long-term physician-patient-family relationships for over 20 years.

Corkum, Penny

Dr. Corkum is a Registered Psychologist with a background in School and Child Clinical psychology. She is an Associate Professor in the Department of Psychology and Neuroscience at Dalhousie University, and Director of Clinical Training for the Clinical Psychology PhD program. Dr. Corkum is cross-appointed in Psychiatry and Pediatrics as well as being on Scientific Staff at IWK Health Centre. In addition to her academic appointments, she is a Psychologist and Co-Director of the Colchester East Hants ADHD Clinic. She conducts clinical research in the areas of child psychopathology (particularly ADHD) and pediatric sleep.

Her research is funded by CIHR, SSHRC, NSHRF and the IWK. The results of her studies have been published in psychology, psychiatry and sleep journals. She is the recipient of the Roger Broughton Young Investigator Award which is given each year to a scientist for important early career research contributions in the area of sleep. One of her research areas is aimed at the intervention of pediatric sleep problems, with the primary goal to reduce the negative impact of sleep problems on the development of the child (e.g., attention, learning, behaviour, social-emotional) and the functioning of the family.

Elsabbagh, Mayada

Mayada Elsabbagh, Ph.D. is Assistant Professor in Psychiatry at McGill University. Her research, in the area of early infancy and developmental disorders, is focused on understanding the brain basis of behavioural genetic disorders. Prior to returning to Canada from the UK in 2011, Mayada supported the successful launch of collaborative research networks in autism including BASIS and ESSEA, aimed at accelerating the pace of discovery in early autism. Mayada is active in the area of knowledge translation locally and internationally. She currently manages the Knowledge Translation portfolio for NeuroDevNet, a Canadian national Network of Center’s of Excellence. She was the recipient of the 2010 UK Economic and Social Research Council Neville Butler Memorial Prize for Longitudinal Research awarded in recognition of the public value and social relevance of her research.

Johnson, Shannon

Shannon Johnson is Associate Professor of Psychology and Director of the Clinical and Cognitive Neuropsychology Laboratory at Dalhousie University. She holds cross-appointments in the Departments of Pediatrics and Psychiatry and is a Scientific Staff member at the IWK Health Centre. Dr. Johnson received her Ph.D. in Clinical Neuropsychology from the University of Victoria. She completed her clinical internship at the Medical University of South Carolina and a post-doctoral fellowship in the Clinical and Cognitive Neuroscience Laboratory at Indiana University. Dr. Johnson’s research focuses on understanding differences in perception, cognition, and social-cognition in individuals with an autism spectrum diagnosis. She has a particular interest in clinical topics that are pertinent to adolescents and
adults with ASD. Research topics in her lab span several areas of psychology including clinical psychology, health psychology, neuropsychology, cognitive psychology, and neuroscience. She also has experience with neurodegenerative and other neurodevelopmental disorders. Her teaching at Dalhousie focuses on child psychopathology and child assessment. Dr. Johnson is part of the ART Program Advisory Committee since 2011.

Kelley, Elizabeth

Dr. Beth Kelley grew up in Toronto and first became interested in individuals with autism while doing some volunteer work in the preschool at Surrey Place. She completed her undergraduate degree in Psychology at York University in 2000, and received her PhD in Developmental Psychology from the University of Connecticut in 2006, whereupon she accepted a position in the Psychology Department at Queen's University. Dr. Kelley has published in a number of prestigious journals including "Child Development", "Current Directions in Psychological Science" and the "Journal of Autism and Developmental Disorders". She has been funded by the National Institutes of Health, Canadian Foundation for Innovation, Autism Speaks, CIHR and NeuroDevNet.

Her research interests vary widely yet are all related to the idea that social difficulties are the core feature of ASD. Dr Kelley’s work is inspired by the awareness that it is no longer enough to ‘discover’ that individuals with ASD perform more poorly on certain tasks. We need to uncover the mechanisms behind the difficulties they experience, both to understand the difficulties from a treatment perspective, and to understand the pathways and processes that contribute to an individual's diagnosis on the autism spectrum.

Kerns, Kimberly

Dr. Kerns is an Associate Professor of Psychology at the University of Victoria, a paediatric neuropsychologist and a registered clinical psychologist in B.C. Dr. Kerns’ clinical interests are in the areas of child/family psychology and pediatric neuropsychology, and her research interests are in developmental/child neuropsychology. She has particular expertise in several aspects of cognitive processing including executive function, attention, working memory and self-regulation. Her research has focused on children with ADHD, Traumatic Brain Injury, and Fetal Alcohol Spectrum Disorders. Dr. Kerns' clinical interests are in learning approaches and child cognitive rehabilitation as well as child & family social and emotional functioning. Dr. Kerns also has experience in the development and evaluation of interventions and rehabilitation tools and strategies for children with cognitive difficulties. She has published both scientific papers and cognitive remediation materials for children with brain injury and attention deficits, and frequently presents to both professional and lay audiences.

Mahoney, William

Dr. Mahoney is Associate Professor, Department of Pediatrics, McMaster University. Dr. Mahoney received his M.D. from McMaster University in 1976. He then did his core Pediatric training in Ottawa and completed a Fellowship in Developmental Pediatrics at the John F. Kennedy Institute associated with John Hopkins Hospital in Baltimore Maryland. He returned to Ottawa in 1981 and worked as a Developmental Pediatrician in the Child Developmental Clinic at the Children's Hospital of Eastern Ontario. Dr. Mahoney came to Hamilton in 1988 and is a Clinical Associate Professor of Pediatrics with the Faculty of Health Sciences at McMaster University. Clinically Dr. Mahoney works with children with developmental disabilities, pervasive developmental disorders, language, learning and attentional disorders. Dr. Mahoney served as Medical Director of the Developmental Pediatric and Rehabilitation and Autism Spectrum Disorder Programs at McMaster Children's Hospital until 2008.

McIntosh, Chris

Chris McIntosh has a soon to be obsolete diagnosis of Asperger’s Syndrome, which he received as an adult. He has been thinking about the nature and psychology of his difference, which turned out to result from autism, for close to 40 years. He first became involved in the autism community through posting to online AS and AS/NT forums. He became involved in the real life autism community when he co-founded Families for Autism Intervention Resources (FAIR) with parents of children on the spectrum. This group was active in lobbying for early intensive therapy programs for children with autism in BC. Chris gave a presentation to the Healthy Communities Commission of the Town of Sidney, where he lives, on making the town more autism friendly. This presentation resulted in the Mayor and Council presenting a resolution to the Union of BC Municipalities calling on the provincial government to fully fund early intensive therapy for children on the spectrum. This resolution passed at the UBCM annual general
meeting. Chris is on the Steering Committee for the Pacific Autism Family Center, the Advisory Council for ACT – Autism Community Training, and is BC’s representative on the Autism Society of Canada’s Advisory Committee of Adults on the Spectrum. Chris recently became involved with the adult autism community. He is a member of the Victoria Asperger’s Syndrome Meetup Group and is a member of Author’s with Autism, a group started by Joseph Sheppard, co-director of the University of Victoria’s Center for Autism Research, Technology and Training (CARTE) and himself an individual with autism. Chris is speaking with other individuals on the spectrum at a conference in Victoria on April 2 to celebrate the first publication of Autism’s Own, a University of Victoria peer reviewed journal written entirely by people with autism about the theme of autism.

Mirenda, Pat

Dr. Pat Mirenda is a Professor in the Department of Educational and Counseling Psychology and Special Education at the University of British Columbia (UBC) and Director of the Center for Interdisciplinary Research and Collaboration in Autism (CIRCA). She is also a Board Certified Behavior Analyst and is responsible for BACB-approved graduate coursework at UBC. She has an extensive publication record and teaches courses on autism, augmentative communication, positive behaviour support, and inclusive education. The fourth edition of her co-authored book “Augmentative and alternative communication: Supporting children and adults and complex communication needs” was published in 2012. In addition, she co-edited “Autism spectrum disorders and AAC” (augmentative and alternative communication), which was published in 2009. Her current research includes a Canada-wide study of developmental trajectories in children with autism, a study of the effectiveness of self-advocacy training with adolescents with Asperger’s syndrome, and studies of the use of video modeling and voice-output communication aids with children with autism.

Nicholas, David

Dr. David Nicholas is Associate Professor in the Faculty of Social Work, University of Calgary, and is cross appointed as a Senior Associate Scientist, Research Institute at The Hospital for Sick Children, Toronto. He brings a strong background in quality of life research with a focus on family experience related to childhood disability and chronic health conditions. Currently, he is evaluating two recently developed, innovative online social support interventions for youth and parents respectively. He is principal investigator in current studies examining both mothers’ and fathers’ caregiving roles and experiences related to autism as well as co-leading a systematic review of interventions for children and adults with autism. He is currently completing a book examining family-centred care as it relates to inter-professional practice. This examination addresses means for understanding and supporting the role of family members, in the context of inter-professional teams, as they facilitate and support service delivery plans for young persons with chronic conditions. Dr. Nicholas holds funding from the Canadian Institutes for Health Research and the Social Sciences and Humanities Research Council of Canada. He brings leadership in the examination of psychosocial adaptation to childhood chronic illness and disability, and has a particular interest and background in knowledge translation.

O’Hara, Bruce

Bruce F. O’Hara, Ph.D. Professor, Department of Biology, University of Kentucky. Dr. O’Hara received his PhD in Human Genetics from The Johns Hopkins University School of Medicine in 1988 and then did post-doctoral work at the National Institute on Drug Abuse from 1988 to 1991 examining genetic aspects of substance abuse. In 1991 he joined the Stanford Center on Sleep and Circadian Neurobiology to direct molecular and genetic approaches towards an understanding of sleep. He also began to develop novel technologies to facilitate high-throughput genetic studies of sleep in mice which he has continued since joining the faculty at the University of Kentucky in 2003. This non-invasive sleep-wake monitoring system has been used at The University of Tennessee Health Sciences Center, Oxford University, Oak Ridge National Laboratory, Washington State, The Jackson Laboratory, and many other locations with goal of identifying genes and gene alleles involved in sleep functions, sleep regulation, and sleep related pathologies. Dr. O’Hara has also begun work on the interaction of sleep, meditation and performance. He has published over 50 peer-reviewed research articles, and several book chapters in these fields, and co-founded two start-up companies to help disseminate new technologies.

Schachar, Russell

Russell Schachar is a practicing child and adolescent psychiatrist, Professor in the Department of Psychiatry at the University of Toronto, and Senior Scientist in the Research Institute at the Hospital for Sick Children in Toronto, Canada where he holds the Toronto Dominion Bank Chair in Child and
Adolescent Psychiatry and heads a cognitive neurosciences laboratory which focuses on psychiatric disorders of childhood and adolescence. The lab consists of graduate students, technicians and associate scientists with diverse expertise. Current projects are aimed at elucidating the genetic architecture of cognition and impulsivity in the general population, the genetics of ADHD and OCD, the neural basis of executive control and psychopathology through functional neuroimaging studies and investigations of the cognitive and behavioral consequences of traumatic brain injury and treatment of acute lymphoblastic leukemia. He currently holds 2.5 million dollars of external grant funds and has published 55 journal articles in the last 5 years.

Singh, Ilina

Dr. Shattuck is an Assistant Professor in the Brown School of Social Work at Washington University in St. Louis, Missouri (USA). Dr. Shattuck joined the Brown School in 2007 from the University of Wisconsin's Waisman Center (dedicated to research on developmental disabilities) where he was a National Institute of Health Post-doctoral Fellow studying autism development and epidemiology. He has published a number of articles on the prevalence and course of autism as well as on policies and services for people with autism and their families. Dr. Shattuck currently is PI of a NIMH-funded grant (R01 MH086489-01) to investigate patterns of service use and related outcomes among youth with autism using data from the National Longitudinal Transition Study 2.

Ilina Singh is Reader in Bioethics and Society in the Department for Social Science, Health and Medicine at King’s College London. She is cross-appointed to the Institute of Psychiatry. Her work examines the psycho-social and ethical implications of advances in biomedicine and neuroscience for young people and families. She is particularly interested in bringing first person perspectives of children into research, theory and policy. Current projects include: the VOICES project (Voices on Identity, Childhood, Ethics & Stimulants: Children join the debate – funded by the Wellcome Trust); SNAPBY (Survey of Neuroenhancement Attitudes & Practices Among British Young People – funded by STICERD); and an edited volume on biomarkers and bio-prediction, published in 2013 by Oxford University Press. Future projects involve a mindfulness intervention for children with behavioral difficulties; and a major research programme on ‘character’ and moral education.

Ilina has published widely in eminent journals, including Nature, Nature Reviews Neuroscience, Social Science and Medicine, and The American Journal of Bioethics. Over the years she has served on committees and working groups for e.g. the UK Nuffield Council on Bioethics, Wellcome Trust, Norwegian Research Council, and NICE (UK National Institute of Clinical Excellence). She is Co-Editor of the journal BioSocieties, and is on the Editorial Board of The American Journal of Bioethics-Neuroscience.

Swedo, Susan E.

Dr. Susan Swedo is Chief of the Pediatrics and Developmental Neuroscience Branch (PDN) in the intramural research program at the National Institute of Mental Health (NIMH). She received her M.D. from Southern Illinois University School of Medicine and completed a pediatrics residency at Children’s Memorial Hospital in Chicago. Following her training, Dr. Swedo served as Chief of Adolescent Medicine for Northwestern University until 1986, when she moved to the Washington DC metro area and joined Dr. Judith Rapoport's Child Psychiatry Branch. Dr. Swedo received tenure in the NIMH Intramural Research Program in 1992 and became Head of the NIMH Section on Behavioral Pediatrics in 1994. She served as acting Scientific Director of the NIMH intramural research program from 1995-1998, before accepting her current position as chief of the PDN Branch. From 2003-2007, Dr. Swedo moved to the extramural program as the NIMH Associate Director for Child and Adolescent Research and became the founding Director of the (extramural) NIMH Division of Pediatric Translational Research and Treatment Development. In those positions, she had oversight responsibility for all of the Institute’s efforts in child psychiatry and pediatric mental health. Dr. Swedo also served as a member of the DSM-5 Task Force and Chair of the DSM-5 Workgroup on Neurodevelopmental Disorders.

Dr. Swedo and her colleagues were the first to identify a post-infectious subtype of obsessive compulsive disorder (OCD), which is known as PANDAS (pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections). This line of research resulted in several novel treatment and prevention strategies, including use of immunomodulatory therapies to treat acutely ill children and antibiotics prophylaxis to forestall future neuropsychiatric symptom exacerbations. The multi-disciplinary clinical research efforts that proved fruitful for OCD are now being directed at understanding the causes and treatments of autism spectrum disorders.
Vaillancourt, Tracy

Dr. Tracy Vaillancourt is a Canada Research Chair in Children's Mental Health and Violence Prevention at the University of Ottawa where she is cross-appointed as a full professor in the Faculty of Education (counselling program) and in the School of Psychology, Faculty of Social Sciences. Dr. Vaillancourt is also an adjunct professor in the Department of Psychology, Neuroscience, & Behaviour at McMaster University and a core member of the Offord Centre for Child Studies. She received her B.A., M.A., and Ph.D. from the University of British Columbia (human development), her post-doctoral diploma from the University of Montreal and Laval University (developmental psychology), and post-doctoral re-specialization in applied child psychology (clinical) from McGill University. Dr. Vaillancourt's research examines the links between aggression and children's mental health functioning, with a particular focus on social neuroscience. She is currently funded by the Canadian Institutes for Health Research.

Weiss, Jonathan

Jonathan Weiss, Ph.D., is an Assistant Professor in the Department of Psychology at York University, and a Clinical Psychologist. He holds the CIHR Chair in Autism Spectrum Disorders Treatment and Care Research, and a New Investigator Fellowship from the Ontario Mental Health Foundation. His research focuses on the prevention and treatment of mental health problems in people with autism spectrum disorders or intellectual disabilities. His research involves individuals with mental health problems, their families, and larger systems of care. He studies the impact of stressors, such as bullying or transitions, and how cognitive behaviour therapy can help youth with ASD who have mental health problems. He is also interested in ways of promoting mental health before problems arise. For instance, he studies Special Olympics, a sports organization for individuals with intellectual and developmental disabilities, and how involvement is related to positive outcomes for athletes (including athletes with autism) and their parents. He studies the experiences of caregiving, caregiver perceptions of the health care system, and what we can do for family members when families are in crisis.

Zwaigenbaum, Lonnie

Dr. Lonnie Zwaigenbaum completed his pediatric training at Queen's University, and his clinical fellowship in developmental pediatrics at The Hospital for Sick Children in Toronto. He completed a research fellowship and Masters degree in Health Research Methodology at McMaster University. Dr. Zwaigenbaum’s research focuses on early behavioral and biological markers, and early developmental trajectories in children with autism and related disorders. He currently holds an Alberta Heritage Foundation for Health Research (AHFMR) Health Scholar and Canadian Institutes for Health Research (CIHR) New Investigator Award. Dr. Zwaigenbaum is currently Associate Professor in the Department of Pediatrics at the U of A, and the co-director of the Autism Research Centre based at the Glenrose Rehabilitation Hospital. He is also an editor of Autism: The International Journal of Research and Practice, and chairs an international research consortium studying early development in autism in high-risk infants.
The Banff Centre

Accommodation
The Banff Centre is located at 107 Tunnel Mountain Drive in Banff, Alberta, in the heart of the Canadian Rockies and approximately 2 hours from the Calgary International Airport.

The Winter Institute conference package includes accommodation, either in the Professional Development Centre or in Lloyd Hall, wireless internet access in bedrooms and delegates use of the Sally Borden Recreation Facility, housing a 25 metre pool, steam rooms, whirlpool, weight room, full-sized gymnasium with indoor running track, badminton, squash court and climbing wall.

Check-in time is 4:00 p.m. While every effort is made to accommodate guests arriving before the check-in time, rooms may not be available. Luggage may be held at the Bell desk until the guest’s room is ready.

Check-out time is 12:00 noon. Request to retain rooms beyond that hour should be directed to the Front Office Manager and may be subject to a late departure charge. Luggage may be held at the Bell desk until time of departure.

Parking is available, complimentary, for all guests of The Banff Centre.

Dining
The meal package includes: Wednesday to Saturday breakfasts and lunches, and Wednesday and Friday dinners, all served in the Vistas Dining room atop the Sally Borden Facility. This market-style buffet menu changes daily. For all guests of the Banff Centre, your room key serves as a payment card at the Vistas Cashier. Off-site staying guests have been issued meal tickets and can retrieve them at the Vistas Cashier. Any meals above the included ones are billed to the guest at check-out time (for example: meals for spouses). Continuous nutrition breaks are offered on the 2nd floor Galleria of the Kinnear Centre.

Meeting spaces and Business Centre
Meetings take place at the Kinnear Centre for Innovation & Creativity. The main plenary room for this conference is KC203 and 2 boardrooms, KC204 and KC202, are available for private meetings. Registration to the event will take place Wednesday, March 6, in KC204, from 8:00-8:45.

The Business Centre is located at the Front Desk in the Professional Development Centre and is open 24 hours to serve your photocopy, fax and computer needs.

Gym classes and outdoor equipment rentals
http://www.banffcentre.ca/sbb/classes/dropin.asp
http://www.banffcentre.ca/sbb/outdoor/

The Banff Centre gym offers drop-in classes that are designed to be welcoming for people of all fitness levels – from the beginner to advanced participant. Noon and evening classes are offered: muscle pump, flow yoga, boot camp, zumba. Drop-in fees are $10 for yoga + $2 mat rental, and $6 for fitness classes.
Getting around

Calgary International Airport to Banff:

Your best option for getting to Banff from the Calgary International Airport is the Banff Airporter, official airport shuttle provider for the Banff Centre. Sit back, relax, and enjoy the scenery as you travel to Banff.

Banff Taxi: 103 Owl St., PO Box 808
Banff, AB, T1L 1C2
Phone: 403-762-4444
Email: info@banfftransportation.com

Public Transit:

The Roam bus routes cover the whole townsite, and there are bus stops near just about any spot you want to get to. Single trip fare is $2.
http://roamtransit.com/wp-content/uploads/2013/01/Local_Schedule_Route.pdf

Activities in Banff

Banff Gondola and observation deck:

Enjoy the ride to the summit of Sulphur Mountain (2251m), where there are hiking trails and observation decks for outstanding panoramic views of Banff and the Rockies. Located at the end of Mountain Avenue. Operation hours from 10am to 6pm, admission is $34.95.

Upper Hot Springs and Pleiades Spa

All the amenities of a modern facility are featured in this historic spa and bath house. Enjoy the comfort of soothing hot water against a backdrop of spectacular alpine scenery. The Upper Hot Springs are on Mountain Avenue, four kilometres south of the Town of Banff. Operation hours are from 10am to 10pm, admission is $7.30. Swimsuit, locker and towel rentals for less than $2 each.
http://www.hotsprings.ca/PLEIADES_BANFF.php
http://www.hotsprings.ca/BANFF_UPPER_HOT_SPRINGS.php

Banff area hiking trails

Here’s a selection of hiking trails located in or near the town of Banff. For a complete list and trail descriptions and conditions, visit this website: http://www.pc.gc.ca/pn-np/ab/banff/activ/activ1/a.aspx

1. Bow River / Hoodoos
4.2 km one way; 60 m elevation gain; 3 hour round trip. Trailhead: Surprise Corner parking lot on Buffalo Street.

2. Spray River Loop
11.4 km round trip; 65 m elevation gain; 3 - 4 hour round trip. Trailhead: Spray River loop parking lot behind the Fairmont Banff Springs Hotel.

3. Sundance Canyon
4.3 km to end of pavement, plus 1.2 km loop through canyon; 145 m elevation gain; 3 hour round trip. Trailhead: Cave and Basin parking lot

4. Tunnel Mountain
2.4 km one way; 260 m elevation gain; 2 hour round trip. Trailhead: Located on St. Julien Road near The Banff Centre

5. Upper Hot Springs
1.1 km one way; 170 m elevation gain; 1 hour one way. Trailhead: Spray River Loop parking lot behind the Banff Springs

6. Sulphur Mountain
5.5 km to top of gondola, plus 0.5 km to Sanson Peak; 655 m elevation gain; 3 - 4 hour round trip. Trailhead: Banff Upper Hot Springs parking lot at the end of Mountain Avenue.

Ski Resorts

Sunshine Village – 8km west of the Town of Banff
Tel: 1-87-SKI-BANFF
http://www.skibanff.com/

Shuttle round-trip: $15, schedule: http://www.skibanff.com/sunshine-village/bus-schedule/

Gondola hours: Saturday to Thursday: 8:00am-5:30pm, Friday: 8:00am-10:30pm
Chair lift hours: 9:00am-4:00pm
Chair lift fares: Adult full day: $82.86, Adult afternoon: $66.95, Sightseeing gondola only: $29.95

Equipment rental: Adult ski/snowboard full package with helmet full day is $44.95 – $59.95, half day is $40.95 - $54.95. Also available is ski suit rental for $19.95.

Mt. Norquay – 6 km from Downtown Banff on the Mt. Norquay access road.
Tel: (403) 762-4421
http://banffnorquay.com/

Shuttle round-trip: $15, schedule: http://banffnorquay.com/local-information/getting-here/

Operation hours: Mon-Sun 9:00am-4:00pm, Fri-Sat 5:00pm-9:00pm
Ski chair lift fares: Adult full day: $59.00, Adult afternoon: $49.00, Night ski: $20.00
Snow tubing rates: Day/night adult 2 hours: $22, Day adult full day/night: $30.
Cliff house sightseeing chairlift rate: $15


Ski rental complete package: Adult full day is $34-48, half day is $29-40
Snowboard complete package: Adult full day is $38, half day is $34

Lake Louise Ski Area - 60 km west of the Town of Banff.
Tel: (403) 522-3555
http://www.skilouise.com/


Operation hours: Mon-Sun 8:00am-5:00pm
Chair lift fares: Adult full day: $82.95, Adult afternoon: $66.95, Sightseeing gondola only: $20.95

Ski equipment rental: Adult full package full day is $39.95 - $54.95, half day is $35.95 – $49.95.
Snowboard equipment rental: Adult full package full day is $37.95 - $49.95, half day is $35.95 – $46.95.

Also available for rental: ski suits, helmets, cross country ski, snowshoes