Friday, April 9, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Dr.
Full Name	Sana Amjad
Department	Obstetrics & Gynecology
Institution / Organization	University of Alberta
Address	8440 112 St. NW Edmonton, Alberta, T6G 2R7 Canada
Phone Number	(587) 920-7752
E-mail Address	sana@ualberta.ca

Abstract Title	The impact of coronavirus (COVID-19) pandemic on the socioeconomic well-being of Métis children in Alberta
Speaker	Sana Amjad
Author	Sana Amjad, Reagan Bartel, Ian Colman, Maria B Ospina

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: The COVID-19 pandemic and the resulting public health measures have caused major socioeconomic disruptions and impacted the health of families worldwide. In collaboration with the Métis Nation of Alberta (MNA), we explored the impact of the COVID-19 pandemic on socioeconomic well-being of Métis children in Alberta.
Methods: We analyzed data from a cross-sectional COVID-19 survey conducted between December 2020-January 2021 among Métis people in Alberta. Respondents were recruited through a multi-modal strategy using social media and MNA newsletters. Survey responses were entered on a Research Electronic Data Capture (REDCap) database held at a secure server at the University of Alberta. We conducted a descriptive analyses of survey responses of Métis parents about children's wellbeing.
Results: From a total of 1,508 respondents, 572 were Métis parents/guardians of children aged <18 years, of which 26% (n=150) had children aged < 4 years. About 35% of parents reported an annual household income of less than $49,000, 46% reported being worse off financially compared to prior the pandemic and 26% reported challenges affording food at least once during the pandemic. About 35% of children attended K12 schools in-person, 25% attended online, 33% received blended schooling and 7% were home schooled. Since the beginning of the pandemic: 1) 30% of the respondents experienced some gaps in childcare; 2) the majority of children (~80%) were reported to have increased screen time and decreased play time (30%) and time spent outdoors (44%); and, 3) about 60% were reported to have spent less time with friends and increased frequency of feeling down, depressed, or upset.

Conclusion: The ongoing COVID-19 pandemic has negatively impacted the material and social wellbeing of Métis families exposing children to poor nutrition, decreased social interaction, and ill mental health. The long term consequences of the pandemic on children's social and emotional development are yet to be seen.

Friday, April 9, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Ms.
Full Name	Emilie Bernier
Department	School of Nutrition
Institution / Organization	Laval University
Address	2425 Rue de l'Agriculture, Local CMT-2412 Quebec, Quebec, G1V 0A6 Canada
Phone Number	(581) 995-0102
E-mail Address	emilie.bernier.4@ulaval.ca
Abstract Title	Critical appraisal of diet quality assessment tools during pregnancy: a systematic review protocol
Speaker	Emilie Bernier
Author	Emilie Bernier (1,2,3), Marianne Gagnon (1,2,3), Sarah O'Connor (4), Anne-Sophie Plante (2,3), Benoît Lamarche (1,2), Anne-Sophie Morisset (1,2,3). Affiliations: (1) School of Nutrition, Faculty of Agricultural and Food Sciences, Université Laval, Quebec, Canada; (2) Nutrition, Health and Society Research Center (NUTRISS) of the Institute of Nutrition and Functional Foods (INAF), Université Laval, Québec, Canada; (3) CHU de Québec Research Center-Université Laval, Quebec, Canada; (4) Institut universitaire de cardiologie et de pneumologie de Québec Research Center (IUCPQ)-Université Laval, Quebec, Canada.

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Several tools and indices have been developed to assess diet quality in the general population. However, even if diet quality has received considerable attention in perinatal nutrition research, there is currently no consensus on how to measure it among pregnant women. Thus, this systematic review aims to identify, describe, evaluate and critically appraise the quality of the tools used to assess diet quality among pregnant women.

Methodology: A MEDLINE, EMBASE, Web of Science, CINAHL, and CENTRAL search was conducted between March 16th and 24th, 2021, to identify original studies in which diet quality was assessed

during pregnancy. No restriction was applied regarding language, year of publication, or participants' health conditions. Reference lists from retrieved articles as well as excluded systematic reviews and meta-analyses will be consulted to identify further relevant studies. Two reviewers will independently review the titles, abstracts, and full texts of identified relevant citations. Data extraction will be performed in two steps by two independent reviewers. A first analysis will identify the diet quality assessment tools used in pregnancy-related research. The genealogy of the identified tools will be analyzed to find the validation or initial publications. The characteristics of the tools will then be extracted. Both extractions will be done using standardized data collection templates. The quality of the identified tools will be assessed according to the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) checklist. Results will be presented descriptively, and no meta-analysis will be performed. This protocol was submitted to PROSPERO on April 6th, 2021.

Preliminary results: The database search identified 4737 citations.

Conclusion: Increased knowledge of diet quality assessment tools applicable to research on pregnancy will facilitate instrument selection in future studies. The collected data could also be used for the development of a new index assessing pregnant women's diet quality.

Friday, April 9, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Dr.
Full Name	Tamara Bodnar
Department	Cellular & Physiological Sciences
Institution / Organization	The University of British Columbia
Address	2350 Health Sciences Mall Vancouver, BC, V6T 1Z3 Canada
Phone Number	(604) 328-2347
E-mail Address	tamara.bodnar@ubc.ca

Abstract Title	Evidence for long-lasting alterations in the fecal microbiome following prenatal alcohol exposure
Speaker	Tamara Bodnar
Author	Tamara S. Bodnar, Athena Wong, Christopher Lee, Laura Wegener Parfrey & Joanne Weinberg

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Mounting evidence in the DOHaD field demonstrates that a range of exposures/experiences/events occurring during early-life can have a lasting impact on health. One exposure that has been understudied under the DOHaD framework is prenatal alcohol exposure (PAE), which has impacts on neurobiological and physiological systems, including the immune and endocrine systems. However, there has been no evaluation of the effects of PAE on the gut microbiota, despite recent recognition that the gut microbiota is functionally liked to the immune and endocrine systems, as well as to the brain. We hypothesized that programming effects of PAE may be occurring, at least partially, through its impact on the microbiota.

Methodology: Pregnant Sprague-Dawley rat dams were assigned to: PAE – ad libitum access to liquid ethanol diet; or Control (C) – ad libitum access to isocaloric control diet. Fecal samples were collected from offspring in adulthood and 16S rRNA (V4 region) sequencing performed using Illumina MiSeq.

Results: Analysis of fecal samples revealed increased richness of bacterial species (α diversity) in PAE animals and differences in community structure (β diversity), with distinct clustering by prenatal treatment. Differences in the relative abundance of key microbes were also identified, with important

sex differences: e.g., Akkermansia was elevated, while Bifidobacterium was decreased in PAE males, whereas both Proteus and Roseburia were elevated in PAE females. By contrast, Bacteroides was elevated in both PAE males and females.

Conclusion/Discussion: Together, these results show, for the first time, that PAE has a long-lasting and sex-specific impact on gut microbiota composition. Importantly, these findings support further investigations into the impact of PAE on the gut microbiota in both animal models and clinical cohorts, with implications for evaluation of possible gut-oriented intervention strategies.

Support: NIH/NIAAA R01 AA022460 to TB and JW.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Meghan Bogert
Department	Pediatrics
Institution / Organization	McMaster University
Address	1280 Main St W, HSC 4A20 Hamilton, ON, L8S4K1 Canada
Phone Number	(905) 521-2100 x75644
E-mail Address	bogertm@mcmaster.ca

Abstract Title	Choline intake and metabolomic signature in early and late pregnancy
Speaker	Meghan Bogert
Author	M Bogert, M Perreault, M Shanmuganathan, P Britz-McKibbin, and SA Atkinson

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Choline is involved in one-carbon transfer reactions and is critical during pregnancy to support fetal development and programming for growth and brain health. We aimed to: 1) measure choline intake from food and supplements across pregnancy; 2) determine the profile of choline metabolites in pregnant women and cord blood.

Methods: An exploratory analysis of choline intake from food and supplements and serum choline-related metabolites in early (14-17 wk) and late (36-38 wk) pregnancy was conducted in the Be Healthy in Pregnancy randomized trial (NCT01689961). Total dietary choline (free choline+betaine+ glycerophosphophorylcholine+ phosphotidylcholine+sphingomyelin) was estimated from 3-day diet records (Canadian choline database (R.Jacobs, University Alberta)) plus supplements. Free choline and cationic polar metabolites were analyzed in fasting serum samples using multi-segment injection capillary electrophoresis mass spectrometry under positive ionization mode.

Results: In 104 pregnant women of mean age 32 years and 92% white Caucasian, median (Q1,Q3) total choline intake was 347(263,427) mg/d in early and 322(2670,437) mg/d in late pregnancy, with ~20% of women achieving the recommended Adequate Intake (450 mg/d). Only 13 women consumed supplemental choline (50-200 mg/d). Serum metabolite profile in late pregnancy (median (Q1,Q3)) of free choline (12.9(11.4,15.1)µmol/L)), betaine (16.6(14.5,19.0) µmol/L)), dimethylglycine(DMG) (17.1(15.1,19.8)µmol/L), methionine (24.8(23.2,26.9)) µmol/L) and Trimethylamine N-oxide TMAO (5.5(4.6,8.1)µmol/L)) was similar to early pregnancy except for free choline which was significantly higher ($p<0.05$) compared to early pregnancy (9.68 (8.25, 10.61) µmol/L)). The same metabolites were identified in 42 cord serum samples in a cord:maternal ratio of 3.9 for free choline, 1.8 for betaine, 1.6 for DMG and methionine and 1.0 for TMAO.

Conclusion: Dietary sources of choline were insufficient throughout pregnancy to meet recommended intakes in most women studied. The higher cord:maternal concentrations for most choline-related metabolites suggests active uptake in late pregnancy, reflecting the importance of these methyl metabolites to meet fetal/infant needs.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Meghan Bogert
Department	Pediatrics
Institution / Organization	McMaster University
Address	1280 Main St W, HSC 4A20 Hamilton, ON, L8S4K1 Canada
Phone Number	(905) 521-2100 ext 75644
E-mail Address	bogertm@mcmaster.ca

Abstract Title	Examination of the Association Between Circulating Maternal Growth Factors and Hormones in Pregnancy and Early Infant Growth
Speaker	Meghan Bogert
Author	Meghan Bogert, Stephanie A Atkinson and the BHIP Research Team

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Adiponectin, leptin, and IGF-1 are known to play a role in growth processes, but few studies have examined longitudinal changes in these growth factors across pregnancy, and whether exposure to these factors in utero influences fetal and newborn infant growth.

Objectives: The aim of this investigation was to explore changes in maternal serum hormone and growth factors across pregnancy and their association with circulating concentrations in cord blood as well as infant anthropomorphic measures at birth and 6 months.

Methods: Women enrolled in the Be Healthy in Pregnancy (BHIP) RCT (NCT01689961) had fasting blood samples collected at 12-17 weeks and 36-38 weeks gestation, and cord blood at delivery. Serum adiponectin, leptin, and IGF-1 were analysed by ELISA. Infant length and weight were obtained from birth records and at 6 months of age were measured by the research assistant along with infant triceps

and subscapular skinfold thickness (SFT) and values compared to WHO growth reference standards. Statistical analysis included linear regression adjusted for maternal pre-pregnancy BMI and study site.

Results: In 137 mother/infant dyads, maternal serum adiponectin, leptin, and IGF-1 were positively correlated between early and late pregnancy ($p < 0.001$); from early to late pregnancy serum IGF-1 rose 98%, leptin 31% and adiponectin declined 18%. Late pregnancy maternal IGF-1 was positively associated with cord serum IGF-1 ($p < 0.001$). Maternal IGF-1 was positively associated with birth weight ($p = 0.018$) while adiponectin was inversely associated with birth weight ($p = 0.009$). IGF-1 was inversely correlated with subscapular SFT ($p = 0.019$). Length velocity from birth to 6 months was associated with both maternal IGF-I ($p = 0.044$) and adiponectin ($p = 0.007$).

Conclusion: This study contributes to the paucity of research on pregnancy-associated changes in maternal growth factors and hormones, and their association with early infant growth.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Jessica Ann Breznik
Department	Medicine
Institution / Organization	McMaster University
Address	1280 Main Street West, MDCL , McMaster Immunology Research Centre Hamilton, Ontario, L8S 4K1 Canada
Phone Number	
E-mail Address	breznikj@mcmaster.ca

Abstract Title	Excess gestational weight gain alters maternal intestinal adaptations in C57BL/6J mice during lactation
Speaker	Dr. Jessica Breznik
Author	Jessica A. Breznik*, Tatiane A. Ribeiro*, Brianna K. E. Kennelly, Erica Yeo, Xuanyu Wang, Elena F. Verdú, Dawn M. E. Bowdish, Deborah M. Sloboda (*co-first authors)

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

BACKGROUND/INTRODUCTION: The intestines regulate nutrient absorption and require extensive structural and functional changes during lactation. Excess gestational weight gain is associated with later-life maternal obesity and comorbidities. It is unclear if excess gestational weight gain alters lactation-associated intestinal adaptations. Macrophages support intestinal immune and functional homeostasis. In an animal model, we investigated effects of excess gestational weight gain on maternal intestinal structure, permeability, and macrophages, during lactation.

METHODOLOGY: Female wildtype C57BL/6J female mice were fed standard chow (17% kcal fat, n=24) or high fat (45% kcal fat, HF, n=32) diet for 2 weeks prior to mating with chow-fed males. Pregnant mice were maintained on their respective diets until post-natal day (P)21. Maternal weight was monitored. At P21, intestinal lengths were measured, and tissues were collected for assessment of intestinal villus

length, crypt depth, and goblet cell numbers after fixation and PAS staining. Intestinal permeability was evaluated in vivo by measuring fluorescence in plasma after oral gavage of FITC-dextran, or in vitro by Ussing chambers. Intestinal macrophages were examined by multicolour flow cytometry.

RESULTS: HF-fed dams had excess weight gain throughout pregnancy ($p<0.05$), and maintained greater weight at P21 ($p<0.05$), compared to chow-fed dams. HF-fed dams had significant reductions in small intestine and colon lengths ($p<0.01$), as well as ileum and colon goblet cell numbers per crypt ($p<0.05$), accompanied by increases in vivo whole-intestine permeability ($p<0.05$), and ileum and colon tissue paracellular permeability ($p<0.01$). Monocyte-derived and tissue-resident macrophage populations in the ileum and colon had significant tissue trophism as well as differences in population dynamics and surface phenotype by diet, including a reduction in the prevalence of monocyte-derived CD4-TIM4- macrophages, yet increases in monocyte-derived CD4+ and embryonic origin tissue-resident CD4+TIM4+ macrophages ($p<0.0001$).

CONCLUSION/DISCUSSION: Diet-induced excess gestational weight gain alters maternal intestinal physiology, permeability, and macrophage population dynamics during lactation.

Friday, March 12, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Aine Brislane
Department	Faculty of Kinesiology, Recreationand Sport.
Institution / Organization	University of Alberta
Address	1-052 Li Ka Shing Center for Research Innovation, 8602-112 Street Edmonton, Alberta, T6G 2E1 Canada
Phone Number	(+44) 746-2870459
E-mail Address	brislane@ualberta.ca

Abstract Title	Access to and Quality of Healthcare for Pregnant and Postpartum Women During the COVID-19 Pandemic
Speaker	Áine Brislane
Author	Áine Brislane PhD, Fionnuala Larkin PhD, Helen Jones PhD, Margie H. Davenport PhD.

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: During the COVID-19 pandemic, obstetric care has adopted new precautions to ensure services can be maintained for pregnant women. The aim of this study was to describe access to and quality of obstetric care for pregnant and postpartum women during the COVID-19 pandemic and to identify factors that predict quality of care at this time.

Methods: Between May 3 and June 28, 2020, we recruited women who were pregnant or within the first 6 months after delivery to participate in an online survey. This included questions on access to obstetric healthcare (type and place of health care provider, changes to obstetric appointments/services, appointment preferences) and the Quality of Prenatal Care Questionnaire (QPCQ).

Results: Of the 917 eligible women, 612 (67%) were pregnant and 305 (33%) were in the first 6 months

after delivery. Sixty-two percent (n = 571) reported that COVID-19 had affected their healthcare; appointments were rearranged, canceled or occurred via virtual means for 29% (n = 166), 29% (n = 167), and 31% (n = 175) of women, respectively. The majority preferred to physically attend appointments (74%; n = 676) and perceived the accompaniment of birth partners as important (77%; n = 471). Sixty-two percent (n = 380) were permitted a birth partner at delivery, 18% (n = 111) were unsure of the rules while 4% (n = 26) were not permitted accompaniment. During pregnancy, QPCQ was negatively associated with disruption to obstetric services including exclusion or uncertainty regarding birth partner permissions [$F(7, 433) = 11.5$, $p < 0.001$, $R2 = 0.16$] while QPCQ was negatively associated with inadequate breastfeeding support postpartum [$F(1, 147) = 12.05$, $p = 0.001$, $R2 = 0.08$].

Conclusion: Pregnant and postpartum have experienced disruption in their access to obstetric healthcare. Perceived quality of obstetric care was negatively influenced by cancellation of appointment(s), suspension of services and exclusion of birth partners at delivery. During this time, continuity of care can be fulfilled via virtual and/or phone appointments and women should receive clear guidance on changes to services including birth partner permissions to attend delivery.

Monday, April 12, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Meredith Lee Brockway
Department	Pediatrics and Child Health
Institution / Organization	University of Manitoba
Address	55 Weston Pk SW Calgary, AB, T3H 5E6 Canada
Phone Number	(403) 689-0970
E-mail Address	merilee.brockway@umanitoba.ca

Abstract Title	Developing the International Perinatal Outcomes in the COVID-19 Pandemic (iPOP) Consortium: Embracing research opportunities in a new reality
Speaker	Meredith Brockway
Author	Meredith Brockway, Helga Zoega, Sarah J Stock, Natalie Rodriguez, David Burgner, Meghan B. Azad and the iPOP Study Team.

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: During the COVID-19 pandemic, lockdowns and other mitigation strategies presented substantial barriers to traditional, in-person methods of conducting research. With these barriers, new opportunities arose for scientists to collaboratively conduct remote research from the safety of their personal work environments. Similarly, the natural experiment of pandemic mitigation efforts provided opportunities for researchers to explore how the lockdown impacted perinatal health outcomes on a global scale. Early evidence suggests dramatic reductions in preterm birth during the lockdowns in some high-income countries. Conversely, reports from some lower-middle income countries indicate an opposite trend, demonstrating an increase in stillbirth. To address these opportunities, we developed an international consortium to examine the impact of the COVID-19 pandemic lockdown on global perinatal outcomes.

Methods: Using a collaborative team science approach, we recruited clinicians, epidemiologists,

statisticians, patient partners, policymakers, and other knowledge users from countries around the world. We recruited collaborators through social media, word of mouth, professional organisations and presentations at international research meetings. We used multiple platforms to encourage virtual interactions including Zoom, Slack, and Google.
Results: Over a 12-week period, we established the International Perinatal Outcomes in the Pandemic (iPOP) consortium (www.ipopstudy.com; >150 collaborators from >40 countries with datasets capturing 2.5M births/year). Our interdisciplinary team has partnered with the International COVID-19 Data Alliance to establish a secure and collaborative digital research environment that will streamline and accelerate efforts to collect, integrate and analyze data from participating centres. We have developed guiding principles, published a study protocol and a perspective highlighting how iPOP aligns with the Lancet Small Vulnerable Newborn Series.
Conclusion: iPOP will provide evidence that is generalizable to the international perinatal community. Results will be rapidly disseminated to inform further research and testable interventions for improving perinatal healthcare and social support systems during, and beyond the pandemic.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Danielle Bronte Cattani, B. (Hons)
Department	Medical Science
Institution / Organization	University of Calgary
Address	406 Rodeo Ridge Calgary, AB, T3Z 3G2 Canada
Phone Number	(403) 998-5137
E-mail Address	danielle.cattani@ucalgary.ca

Abstract Title	Work-related Disparities between Pregnant Individuals and their Partners During the COVID-19 Pandemic
Speaker	Danielle Cattani
Author	Danielle Cattani, Catherine Lebel, Lianne Tomfohr, Gerald Giesbrecht

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background

The COVID-19 pandemic has prompted an unprecedented time of economic change. An area of concern is disparities in job changes between pregnant individuals and their partners. Prior to the pandemic, pregnant individuals were more likely than their peers to experience work-related discrimination from employers, supervisors, and coworkers (Little et al., 2015). Furthermore, as many pregnant individuals identify as women, they may be at a 24% greater risk of losing employment due to COVID-19 (Dang et al., 2021). Thus, pregnant individuals have entered the pandemic's rapidly changing economic landscape at a disadvantage. Here, we investigated how work-related inequalities for pregnant individuals have been emphasized during the COVID-19 pandemic.

Methods

Through the Pregnancy During the Pandemic Study, we collected survey responses about work-related changes for pregnant individuals and their partners. Survey data was collected from 9,948 participants across Canada in French and English. Questions specified changes in work hours, employment, and work from home status. We used Chi-Square tests to compare differences in work-related changes between pregnant individuals and their partners. Participant numbers (N) differ by analysis depending on survey response rates.

Results

There were significant differences in work-related changes between pregnant individuals and their partners. Notably, more pregnant individuals worked from home (X^2 (4, N = 4258) = 216.11, $p < .001$), had more changes in work hours (X^2 (16, N = 7076) = 399.40, $p < .001$), and were temporarily (X^2 (1, N = 3779) = 18.18, $p < .001$), or permanently laid off (X^2 (1, N = 3645) = 14.73, $p < .001$) in comparison to their partners during the COVID-19 pandemic.

Conclusions

Our findings suggest that work-related inequalities exist between pregnant individuals and their partners during the COVID-19 pandemic. Consequently, it appears that the pandemic has highlighted stark and potentially gendered job disparities for pregnant individuals.

Thursday, April 8, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Yuan Yao Chen
Department	Department of Pediatrics
Institution / Organization	University of Alberta
Address	10811 47 Ave NW, 502 Edmonton, Alberta, T6H 5J2 Canada
Phone Number	(780) 566-8631
E-mail Address	yuanyao@ualberta.ca
Abstract Title	Impact of maternal intrapartum antibiotics, birth mode and breastfeeding status on levels of Bifidobacterium in infant gut microbiota
Speaker	Yuan Yao Chen
Author	Yuan Yao Chen, David Zhao, Piush Mandhane, Elinor Simons, Theo Moraes, Stuart Turvey, Padmaja Subbarao, James Scott, Anita Kozyrskyj

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: The genus Bifidobacterium is a pioneer gut colonizer and exerts a positive effect on host health. Breast milk is a rich source of glycans that selectively encourage growth of Bifidobacterium. Formula-feeding with deficiency of Bifidobacterium is associated with overweight, allergies and asthma. However, the impact of birth events, including birth mode, labour duration and maternal intrapartum antibiotic prophylaxis (IAP) on Bifidobacterium colonization remains unknown and will be determined.

Method: This study included 1,654 term infants from the Canadian Healthy Infant Longitudinal Development birth cohort. Data on birth events and breastfeeding status at 3 months were obtained. The gut microbiota of faecal samples collected at 3 months were profiled by 16S rRNA sequencing; genus Bifidobacterium was quantified by qPCR. Group differences were determined by Kruskal-Wallis

and linear discriminant analysis effect size. Associations between Bifidobacterium and other gut microbiota were examined by Spearman's rank correlation.

Result: Bifidobacterium was low in breastfed infants born to mothers who received IAP. Members of the Proteobacteria were more abundant when genus Bifidobacterium was depleted in infants delivered by CS, independent of feeding status. Across most birth modes in exclusively breastfed infants, genus Bifidobacterium was positively correlated with genus Rothia, Prevotella, Enterococcus, Lactobacillus and Streptococcus, and negatively correlated with Clostridium.

Conclusion: This study documents the impact of birth events and feeding status on the abundance of gut Bifidobacterium, and provides novel insights into its interaction with other gut microbiota, both of which potentially contribute to immediate and long-term health consequences.

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Carlene Hailey Cihosky
Institution / Organization	University of Western Ontario
Address	273A Windermere Rd London, ON, N6G2J7 Canada
Phone Number	(647) 467-0122
E-mail Address	ccihosky@uwo.ca

Abstract Title	Understanding the impact of life-long maternal western diet consumption on fetoplacental development
Speaker	Carlene Cihosky
Author	Carlene Cihosky, Karen Nygard, Patti Kiser, Bryan Richardson, Timothy Regnault

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: Western diets (WD) (high saturated fats and refined sugars) constitute a maternal stress detrimental to fetoplacental development. Neurodevelopment depends on a balance of cell growth and inflammation directed in part by placental-derived signals, such as Brain-Derived Neurotrophic Factor (BDNF), which is involved in both placental and neurodevelopment. Alterations in placental development arising from maternal stressors may underlie long-term fetal cognitive deficits. Our aim was to investigate effects of lifelong maternal WD on placental development and its correlation to fetal neurodevelopment, specifically hippocampal cell proliferation and microglial activation.

Methods: Pregnant guinea pigs raised on Control, or WD were sacrificed on day 65 gestation (Term ~68 days) and fetal necropsy was performed (Control n=9, WD n=24). H&E stained placentae were scored for pathology (necrosis and fibrin thrombi). Placental BDNF expression was investigated by western blot. Cell proliferation and microglial activation were assessed in the hippocampus and surrounding white matter using immunohistochemistry to analyze ki67 (cell proliferation) and iba1 (microglia marker) expression.

Results: While there was no difference in fetal body or brain weights, WD fetuses had increased placental weights ($p<0.01$) compared to controls. Pathology scores were 5-fold higher (greater incidence and severity of necrosis and fibrin thrombi) in the WD placentae ($p<0.05$). Ki67-positive cells decreased, albeit not significantly, in all hippocampal regions of WD fetuses compared to controls. BDNF and microglia analyses are currently underway.

Conclusion: WD consumption resulted in placental necrosis and fibrin thrombi, evidence of disrupted morphological development. It remains unknown how these morphological features affect placental functions, including its role in programming fetal neurodevelopment. Understanding the impacts of maternal WD on placental function will help identify developmental causes of adult-onset cognitive decline and associated mental disorders.

Thursday, March 25, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Ana Paula Prescivalli Costa
Department	Faculty of Health Sciences
Institution / Organization	Simon Fraser University
Address	11088 64A Avenue Delta, BC, V4E1E3 Canada
Phone Number	(778) 956-8330
E-mail Address	apcosta@sfu.ca

Abstract Title	Chronic inflammation and the pace of reproductive maturation in adolescent Mayan girls
Speaker	Ana Paula Prescivalli
Author	AP Prescivalli, KG Salvante, RM Altman, SA Venners, A Rowlands, EC Juergensen, PA Nepomnaschy

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

According to Life History Theory, when metabolic energy availability is limited, trade-offs ensue amongst growth, maintenance, development, and reproductive tasks. Thus, as chronic inflammation represents an energetic challenge, we should expect it to slow down the pace of reproductive maturation. In adolescent girls, menarche (the onset of ovarian cyclicity) represents an energetically demanding process. As such, its onset may be influenced by metabolic energy availability. Here we test the following predictions: i) chronic inflammation should be associated with later age at menarche; and ii) chronic inflammation should be associated with a slower pace of reproductive maturation post-menarche (i.e., a longer period of ovarian irregularities). Using data from a group of 20 Mayan Guatemalan girls in 2013 (before menarche; age range: 10-11) and in 2017 (after menarche; age range: 14-15), we assessed girls' inflammation status by quantifying C-reactive protein and interleukin-1β in salivary specimens, and reproductive status by quantifying follicle-stimulating hormone, estrogen, and progesterone in daily first morning urinary specimens. Consistent with our prediction, girls with chronic inflammation showed a 15-months delay average (95% confidence interval [5.8, 24.1]) age at

menarche compared to girls with no inflammation. We found no association between chronic inflammation and cycle length or ovulation frequency post menarche. Further research will be needed to replicate our findings in terms of the link between low-grade immunological challenges and age at menarche.

Friday, April 2, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Grace A. Dionne
Department	Physiology & Pharmacology
Institution / Organization	University of Western Ontario
Address	1151 Richmond Street, Dental Sciences Building 00066 London, ON, N6A 3K7 Canada
Phone Number	(905) 914-3205
E-mail Address	gdionne2@uwo.ca

Abstract Title	Fatty acid regulation of Nrf2/Keap1 pathway during mouse preimplantation embryo development
Speaker	Grace Dionne
Author	Grace Dionne

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background. Infertility is a global health issue, and obese women experience a higher incidence of infertility than women with healthy BMIs. Obesity-conditioned reproductive tracts supporting preimplantation embryo development likely contain stressors including enhanced free fatty acid (FFA) levels. Exposure to palmitic acid (PA) in vitro impairs mouse embryo development while increasing ER stress mRNAs. Oleic acid (OA) rescues these effects. This study investigated the influence of FFA exposure on preimplantation mouse embryos by characterizing their impact on the Nrf2–Keap1 antioxidant pathway. We hypothesized that PA treatment induces Nrf2-Keap1, while OA treatment alleviates pathway activity.

Methodology. Female CD-1 mice were superovulated via injections of PMSG and hCG, mated with male mice, and two-cell embryos were collected and placed into KSOMaa-based treatments: 1) BSA (control); 2) 100μM PA; 3) 100μM OA; 4) 100μM PA+OA, and cultured for 48 hours before assessment of blastocyst development. Immunofluorescence of Nrf2 localization was performed using anti-Nrf2 antibody, Rhodamine-Phalloidin, and DAPI. Embryos were imaged using confocal microscopy and Nrf2-

positive cells were measured using ImageJ. Nrf2 and Keap1 mRNA abundance were assessed after culture in each treatment condition using RT-qPCR.

Results. PA treatment significantly decreased blastocyst development frequency, while OA and PA+OA treatments did not impair development. PA treatment significantly increased mean percentage of immunofluorescent Nrf2-positive cells compared with other groups. qPCR analysis detected higher Nrf2 and Keap1 mRNA abundance after OA treatment compared with other culture conditions.

Discussion/Conclusion. Evidence suggests that preimplantation embryo FFA exposure modulates the Nrf2–Keap1 pathway, which is likely a key component of the mechanism early embryos employ to offset the negative effects of obesity.

Research is supported by a Project Grant from the Canadian Institutes of Health Research (CIHR) to AJW, BAR, and DHB. There are no competing interests to declare.

Wednesday, March 24, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Justine Dol
Department	Health
Institution / Organization	Dalhousie University
Address	6299 South St Halifax, NS Canada
Phone Number	
E-mail Address	Justine.dol@dal.ca

Abstract Title	Impact of COVID-19 restrictions on the postpartum experience of women living in Eastern Canada: A mixed methods cohort study
Speaker	Justine Dol
Author	Dol, J., Richardson, B., Aston, M., McMillan, D., Tomblin Murphy, G., & Campbell-Yeo, M

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background/Introduction:Social support in the postpartum period is important in developing parenting self-efficacy and decreasing postpartum anxiety and depression. However, during the COVID-19 pandemic, women's mental health has suffered. There is limited knowledge on the impact that COVID-19 has had on the postpartum experience of new mothers.

The objectives were to compare changes in psychosocial outcomes in Canadian women collected before (Cohort 1) and during the COVID-19 pandemic (Cohort 2); explore the women felt related to having a newborn during the pandemic; and explore ways that women coped.

Methodology: Prior to the pandemic (October 1, 2019-January 1, 2020), an online survey was conducted with women had given birth within the past six months in one of the three Eastern Canadian Maritime provinces (Cohort 1). A second, similar survey was conducted between August 1, 2020 and October 31,

2020 (Cohort 2) during a period of provincial pandemic response to COVID-19.

Results: For Cohort 1, 561 women completed the survey and 331 women in Cohort 2. Cohorts were similar in terms of age of women, parity, and age of newborn. There were no significant differences for self-efficacy, social support, postpartum anxiety, and depression between the cohorts. Difficulties that women reported as a result of COVID-19 restrictions included lack of support from family and friends, fear of COVID-19 exposure, feeling isolated and uncertain, negative impact on perinatal care experience, and hospital restrictions. Having support from partners and families, in-person/virtual support, as well as self-care and the low prevalence of COVID-19 in these provinces helped women cope.

Conclusion/Discussion: While there was no significant difference in pre-pandemic and during pandemic psychosocial outcomes, there were still challenges and negative impacts that women identified. Consideration of vulnerable populations is important when making public health recommendations.

Thursday, March 25, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Camille Dugas
Department	Nutrition
Institution / Organization	Laval University
Address	445 , rue learmonth Québec, Quebec, G1S1P7 Canada
Phone Number	(418) 928-4779
E-mail Address	camille.dugas.1@ulaval.ca

Abstract Title	Association between Gestational Diabetes Mellitus and Human Milk Composition
Speaker	Camille Dugas
Author	Camille Dugas, Julie Perron, Nadine Leblanc, Alain Doyen, Vincenzo Di Marzo, Alain Veilleux, Julie Robitaille

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background Breastmilk (BM) intake is associated with obesity reduction in children, but this correlation is quite unclear among offspring of women with gestational diabetes mellitus (GDM), suggesting an altered composition of BM in the context of GDM. Thus, the aim of this study was to compare the composition of BM in lactose, glucose, and triacylglycerols (TG) among women with (GDM+) and without (GDM-) previous GDM.
Methodology GDM+ (n=24) and GDM- (n=29) women were recruited 2 months after delivery. A 2-hour 75g oral glucose tolerance test (OGTT) and measure of body composition (Tanita analyser BC-418) were performed for all women. In addition, a sample of 30-60 mL of BM was collected at the end of a feeding and frozen at -80°C until analyses. TG were analysed by colorimetry and lactose and glucose by high-performance liquid chromatography with refractive index detection (HPLC-RID). BM composition was compared between groups using Student t Test and ANOVA adjusted for maternal age, maternal body mass index (BMI) and fasting glucose levels.
Results GDM+ women were older (33.5±3.6 vs 30.0±3.1 years, p=0.0004), had higher BMI (31.0±7.2 vs

27.7±5.9 kg/m2, p=0.07), fat mass (39.6±8.2 vs 35.4±9.8 %, p=0.09), fasting glucose levels (5.00±0.42 vs 4.80±0.31 mmol/L, p=0.05), and 2-h glucose levels (6.21±1.47 vs 5.10±0.95 mmol/L, p=0.002) compared to GDM- women. BM concentration in TG was higher in GDM+ compared to GDM- women (71.0±22.9 vs 59.7±13.3 mmol/L, p=0.04), while levels of lactose (114.7±15.1 vs 121.7±18.8 mg/ml, p=0.15) and glucose (0.69±0.20 vs 0.67±0.13 mg/ml, p=0.81) were similar between groups. After adjustment for maternal age, maternal BMI and fasting glucose levels, the difference in TG levels was no longer significant (p=0.39).
Conclusion TG levels were higher in BM of GDM+ women compared to GDM- women. However, other factors associated with BM composition in GDM+ women should be further investigated.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Mr.
Full Name	Zachary JW Easton
Department	Physiology and Pharmacology
Institution / Organization	Western University
Address	886 Dundas Street London, ON, N5W 3A1 Canada
Phone Number	(519) 897-1341
E-mail Address	Zeaston@uwo.ca

Abstract Title	Characterization of BeWo trophoblast metabolic function in response to hyperglycemia culture conditions
Speaker	Zachary JW Easton
Author	Zachary JW Easton and Timothy RH Regnault

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: Gestational diabetes (GDM) is associated with metabolic impairments in the villous trophoblast layer (comprised of progenitor cytotrophoblasts (CT) and fused multi-nucleated syncytiotrophoblasts (SCT)) of the term placenta. Specifically, GDM placentae demonstrated reduced mitochondrial respiratory function, as well as reduced protein content and activity of Electron Transport Chain (ETC) complexes I and II. These metabolic impairments in the villous trophoblasts are thought to underlie in utero programming of metabolic disease in GDM-exposed offspring. However, the mechanisms underlying the development of placental mitochondrial impairments in GDM pregnancies remain ill defined. It was postulated that glucose overabundance would negatively regulate mitochondrial function in BeWo trophoblasts.
Methods: BeWo trophoblasts were treated with F12K media (7 mM glucose) supplemented to 25 mM glucose for 72H. At 24H cells were treated with 250 µM 8-Br-cAMP or vehicle control to induce differentiation to SCT-like cells. The Seahorse XF Mito Stress Test was utilized to quantify mitochondrial activity of live cells. Individual ETC complexes were measured by western blot and spectrophotometric enzyme activity assays. Statistical analysis was completed via randomized-block

two-way ANOVA. Additional BeWo CT cultures were collected for transcriptomic analysis (Clariom S mRNA microarray). Transcriptomic data was analyzed via Transcriptomic Analysis Console software (±1.3 fold-change; $p<0.05$) and functional pathways were examined using WikiPathways.
Results: Hyperglycemia was not associated with altered mitochondrial respiratory activity or ETC complex chain protein abundance or activity in BeWo trophoblasts. Transcriptomic analysis highlighted 197 differentially regulated genes (75 up-regulated; 122 down-regulated) in hyperglycemic BeWo CT cells. Pathway analysis highlighted altered PI3K-AKT signaling and lipid metabolic pathways associated with steatosis in hyperglycemic BeWo cultures.
Discussion: These data demonstrate that short-term hyperglycemia alone may not induce mitochondrial impairments in cultured trophoblasts. However, transcriptomic analysis highlights that short-term hyperglycemia may alter placental lipid metabolism that could promote later development of mitochondrial dysfunction in trophoblast cells.

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Rhizlane El omri
Department	Biology
Institution / Organization	INRS- Armand Frappier Santé Biotechnologie
Address	531 Boul des Prairies Laval, Quebec , QC H7V 1B7 Canada
Phone Number	450 687-5010
E-mail Address	rhizlane.elomri@inrs.ca

Abstract Title	Mapping of DNA methylation in rat male germ cells during gametogenesis
Speaker	Rhizlane El omri-Charai
Author	Rhizlane El omri-Charai, Isabelle Gilbert, Mariana Gabriela Ghinet, Rebecka Desmarais, Julien Prunier, Claude Robert, Guylain Boissonneault, Géraldine Delbes

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: In mammals, DNA methylation (5mC) in male germ cell display dynamic changes during gametogenesis and spermatogenesis, establishing the sperm epigenome, essential for proper embryo development. 5mC can be under the influence of environmental toxicants, leading to abnormal germline and transgenerational inheritance. However, we lack the comprehensive understanding of the establishment of 5mC during gametogenesis, especially in rats, the preferred animal model in toxicology. We aim to provide the first detailed developmental 5mC map in the rat male germline.

Methods: Germ cells were purified by fluorescent-activated cell sorting, using transgenic rats expressing GFP exclusively in germ cells, combined with DNA staining to gate for ploidy and nuclear compaction. We obtained 8 cell populations will a minimum of 80% purity (n=4 / stage): 1- gonocytes from gestational day 16 (GD16); 2: GD20; 3: postnatal day 5 (PND5) spermatogonia; 4: spermatids (stages 1-8); 5: spermatids 9-12; 6: spermatids 13-14; 7; spermatids 15-17; 8: cauda epididymal sperm.

5mC was assessed using the Agilent rat Methyl-Seq kit, targeting promoters, CpG islands, island shores, and GC-rich regions. Sequencing data were analyzed using Bismark Bisulfite Read Mapper and methylation-extractor.

Results: We observed a gradual increase in 5mC during gametogenesis with 5mC patterns being almost similar between PND5 and spermatozoa. Using Smart 2, 68,407 stage specific differentially methylated regions (DMR) were identified out of 103,720 regions analyzed (mean size of 472bp). These include 11,105 DMRs at GD16, 54,265 common at GD16/20, 2,224 at PND5, most being hypomethylated (99.9%, 99.7% and 82.3% respectively). Only 53 DMR were identified between the different spermatids steps suggesting only little change in 5mC pattern during post-meiotic differentiation. Further analysis will reveal the location and function of these DMRs.

Conclusion: We have established the first map of the rat male germline methylome, which will ultimately help identify epigenetic signatures of exposure to chemicals.

Saturday, March 27, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Elizabeth Elder
Department	Biochemistry and molecular medicine
Institution / Organization	Université de Montréal
Address	2900, boul. Édouard-Montpetit, bureau D-360 Montréal, Québec, H3T 1J4 Canada
Phone Number	
E-mail Address	elder.elizabeth@icloud.com

Abstract Title	TEMPORARY INACTIVATION OF DNMT1 DNA METHYLATION MAINTENANCE CAUSES PERMANENT EPIGENETIC ERRORS IN EMBRYONIC STEM CELLS
Speaker	Elizabeth Elder
Author	Elizabeth Elder, Anthony Lemieux, Maxime Caron, Karine Doiron, Serge McGraw

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background

The maintenance of DNA methylation by DNA methyltransferase 1 (DNMT1) is particularly important for regulating cellular differentiation, the process through which a stem cell undergoes specialization. During differentiation, DNA methylation patterns are dynamic, but certain profiles must be maintained by DNMT1 as a form of epigenetic memory, contributing to lineage classification and quality control of stem cells. This project aims to investigate the epigenetic consequences if DNMT1 is temporarily inactivated and determine the impact on differentiation potential towards germ layers. Since we know that epigenetic mechanisms rarely act alone and instead interact with each other to regulate the genome, we expect that deregulation of DNA methylation maintenance will cause ricochet effects on other mechanisms such as histone modifications.

Methodology

We use a mouse embryonic stem cell (mESC) model in which a doxycycline controllable cassette was added to the Dnmt1 promoter; Dnmt1 is inactivated upon doxycycline treatment and reactivated when doxycycline is removed. We then measured DNA methylation (RRBS), histone modifications (ChIP-seq) and gene expression (RNA-seq) changes.

Results

We show that temporary DNMT1 inactivation causes permanent errors in DNA methylation and histone modifications within promoters of developmental importance, and in well-known imprinting control regions. We also show that poising of chromatin, essential for maintaining pluripotency, is significantly altered suggesting that stem cell quality is most likely affected. Therefore, we expect to observe impairment of differentiation potential and gene expression deregulation in germ layers in next experiments.

Conclusion

This project will demonstrate the importance of maintaining specific epigenetic profiles in embryonic stem cells as to ensure proper regulation of early development and show how temporarily disturbing DNA methylation maintenance induces a domino effect on histone modifications leading to permanent errors in both epigenetic marks. Next, we will use epigenome editing to correct epigenetic errors in early embryonic cells.

Thursday, March 25, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Yeneir Vera Fernandez
Department	Alliance for Human Development-Sinai Health System
Institution / Organization	Lunenfeld-Tanenbaum Research Institute
Address	250 Orde Street, Room 6-1004 Toronto, Ontario, M5T 3H7 Canada
Phone Number	(416) 786-6399
E-mail Address	vfernandez@lunenfeld.ca

Abstract Title	Title: National Cuban Child Cohort Study: Sixth follow-up of the cohort started in 1973
Speaker	Dr. Yeneir Vera
Author	Dr. Yeneir Vera, Dr. Mercedes Esquivel, Dr. Emilio Buchaca, Dr. Gisela Alvarez, Dr. Yordanka Morgado

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: The National Cuban Child Cohort Study (NCCS) has compiled a large amount of data related to health and development during pregnancy, childhood and adolescence in a cohort that included all children born in the country in the first week of March 1973 (N = 4299); they were analyzed at the time of their birth, at 7 months, 7, 11 and 17 years.

Objective: To describe the rationale, design, methods and the most relevant findings of the follow-up carried out in this population - which soon will approach its fifth decade of life - and its relations with the antecedents of its pre and postnatal growth.

Methods: This is a prospective longitudinal study that aims to carry out a new cross-section in the members of the cohort residing in the city of Havana, who will be invited to take part in the sixth follow-up of the cohort (N = 850). Each participant will be given a questionnaire with socioeconomic data, medical history and lifestyle and, in addition, a physical examination, anthropometric

measurements and a set of blood samples will be performed.

Results: The characteristics of the research proposal of the new follow-up cohort will be presented to characterize health and current socioeconomic conditions of this population during adulthood.

Conclusions: The National Cuban Child Cohort Study will generate multiple satellite studies that will explore methodology issues, etiology questions, and target new potential interventions. Data from the NCCS related to the characteristics of the pregnancy, childhood and adolescence will guide us to understand the risk factors and health problems that affect this population during adulthood and understand better the origin and development of chronic diseases.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Prof.
Full Name	Bénédicte Fontaine-Bisson
Department	Nutrition Sciences
Institution / Organization	University of Ottawa
Address	25, University Private, University of Ottawa, THN223 Ottawa, Ontario, K1N 6N5 Canada
Phone Number	(613) 562-5800 #3482
E-mail Address	bfontain@uottawa.ca

Abstract Title

1. School of Nutrition Sciences, Faculty of Health Sciences, University of Ottawa, Ontario, Canada. 2. School of Human Kinetics, Faculty of Health Sciences, University of Ottawa, Ontario, Canada. 3. School of Nutrition, Faculty of Agricultural and Food Sciences, Université Laval, Quebec, Canada 4. Nutrition, Health and Society Research Center (NUTRISS) of the Institute of Nutrition and Functional Foods (INAF), Université Laval, Québec, Canada 5. Health Sciences Library, Faculty of Health Sciences, University of Ottawa, Ontario, Canada. 6. Institut universitaire de cardiologie et pneumologie de Québec (IUCPQ), Université Laval, Québec, (QC), Canada 7. Institut du savoir Montfort, Hôpital Montfort, Ontario, Canada The Institute of Medicine established gestational weight gain (GWG) evidence-based guidelines for pregnant women. Although these guidelines are subjected to some criticism, they remain widely used by healthcare professionals and researchers internationally to achieve healthier pregnancy outcomes. Women of lower socioeconomic status are particularly susceptible to inadequate (excessive or insufficient) GWG and are at greater risk of related maternal and fetal adverse health outcomes. Since the social determinants of GWG are insufficiently understood, healthcare professionals lack a defined strategy to effectively counsel these vulnerable pregnant women. This scoping review explored a breadth of studies measuring associations between social, economic and cultural factors and inadequate GWG. Comprehensive

searches were performed in August 2019 using Medline, Embase, CINAHL PsycINFO and Sociological Abstracts. Databases were searched from inception. Studies from high-income countries published in English or French were included if the main population was pregnant women, data for GWG was presented, and pre-established determinants could be identified. Qualitative and intervention studies were excluded. Of the 6,420 studies identified, 200 were included in the review. The majority of studies (81.5%) assessed a North American population and the remaining were conducted in Europe (11%), Asia (5%), Oceania (2%), and Africa (0.5%). The most common factors associated with inadequate GWG were race/ethnicity, adolescent age, marital status, immigration status, abuse, income, and education. Although trends were identified, associations between these determinants and inadequate GWG appeared to be context and population dependent. A conceptual framework could help to illustrate the variety and complexity of factors involved in inadequate GWG among vulnerable populations.

Speaker Bénédicte Fontaine-Bisson

Author Jocelyne Labonté1, Emily Clark2, Alex Dumas2, Claudia Savard3,4, Karine Fournier5, Sarah O'Connor 6, Anne-Sophie Morisset 3,4, Bénédicte Fontaine-Bisson1,7

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

1. School of Nutrition Sciences, Faculty of Health Sciences, University of Ottawa, Ontario, Canada.
2. School of Human Kinetics, Faculty of Health Sciences, University of Ottawa, Ontario, Canada.
3. School of Nutrition, Faculty of Agricultural and Food Sciences, Université Laval, Quebec, Canada
4. Nutrition, Health and Society Research Center (NUTRISS) of the Institute of Nutrition and Functional Foods (INAF), Université Laval, Québec, Canada
5. Health Sciences Library, Faculty of Health Sciences, University of Ottawa, Ontario, Canada.
6. Institut universitaire de cardiologie et pneumologie de Québec (IUCPQ), Université Laval, Québec, (QC), Canada
7. Institut du savoir Montfort, Hôpital Montfort, Ontario, Canada

The Institute of Medicine established gestational weight gain (GWG) evidence-based guidelines for pregnant women. Although these guidelines are subjected to some criticism, they remain widely used by healthcare professionals and researchers internationally to achieve healthier pregnancy outcomes. Women of lower socioeconomic status are particularly susceptible to inadequate (excessive or insufficient) GWG and are at greater risk of related maternal and fetal adverse health outcomes. Since the social determinants of GWG are insufficiently understood, healthcare professionals lack a defined strategy to effectively counsel these vulnerable pregnant women. This scoping review explored a breadth of studies measuring associations between social, economic and cultural factors and inadequate GWG. Comprehensive searches were performed in August 2019 using Medline, Embase, CINAHL PsycINFO and Sociological Abstracts. Databases were searched from inception. Studies from high-income countries published in English or French were included if the main population was pregnant women, data for GWG was presented, and pre-established determinants could be identified. Qualitative and intervention studies were excluded. Of the 6,420 studies identified, 200 were included in the review. The majority of studies (81.5%) assessed a North American population and the remaining were conducted in Europe (11%), Asia (5%), Oceania (2%), and Africa (0.5%). The most common factors associated with inadequate GWG were race/ethnicity, adolescent age, marital status, immigration

status, abuse, income, and education. Although trends were identified, associations between these determinants and inadequate GWG appeared to be context and population dependent. A conceptual framework could help to illustrate the variety and complexity of factors involved in inadequate GWG among vulnerable populations.

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Thoko Hanjahanja-Phiri
Department	School of Public Health and Health Systems
Institution / Organization	University of Waterloo
Address	200 University Ave W Waterloo , ON, N2L 3G1 Canada
Phone Number	(231) 930-2795
E-mail Address	thokozani.phiri@gmail.com

Abstract Title	A novel prenatal supplement versus intergenerational effects of maternal exposure to drought in early life in Malawi
Speaker	Thoko Hanjahanja-Phiri
Author	Thokozani Hanjahanja-Phiri

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction
This research is part of the broader research on the impact of drought exposure on health outcomes, as outlined in literature. It was hypothesized that there would be intergenerational effects on birth outcomes from maternal exposure to drought of 1981/82, 1987/88, or 1992/93 in early life. Second, it was hypothesized that prenatal supplementation with a lipid-based nutrient supplement (LNS) compared to iron folic acid (IFA) would reduce the impact of maternal exposure to drought in early life.

Methodology
Much of the data was derived from the iLiNS-DYAD-M trial (NCT01239693), which enrolled pregnant women and their infants post-birth. Each pregnant woman received a prenatal supplement: small-quantity (SQ)-LNS, multiple micronutrients (MMN), or IFA. Inclusion in the present study depended on a known maternal date of birth (DoB) [n=1262]. The exposure variables were maternal exposure to

drought at age 0-5 y, 0-2 yr, or 3-5 yr. The study outcomes were infant length-of-age Z score (LAZ), infant weight-of-age Z, and infant birthweight.

Results
Using ordinary least squares regressions, there were no effects observed for maternal exposure to drought at age 0-5 yr, 0-2 yr, 3-5 yr on any of the birth outcomes, controlled for covariates. However, infants of mothers exposed to the 1992/1993 drought from age 0-5 yr fared worse if their mothers received SQ-LNS compared to IFA (LAZ: -0.487, WAZ: -0.488, Birthweight: -175.820 g).
Conclusion
There were no intergenerational effects observed for maternal exposure to drought at age 0-5 yr, 0-2 yr, 3-5 yr on birth outcomes, when controlled for covariates. However, in the more severe drought of 1992/93, improved birth outcomes were observed among infants whose mothers received IFA compared to SQ-LNS. However, among mothers not exposed to drought, supplementation with SQ-LNS was associated with improved birth outcomes compared to IFA.

Thursday, March 11, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Shela Hirani
Department	Faculty of Nursing
Institution / Organization	University of Regina
Address	RIC 516, University of Regina, 3737 Wascana Parkway Regina, SK, S4S 0A2 Canada
Phone Number	(780) 707-5997
E-mail Address	shela.hirani@uregina.ca

Abstract Title	Effects of Disaster and Displacement on Breastfeeding Mothers in Post-disaster Settings
Speaker	Dr. Shela Hirani
Author	Dr. Shela Hirani

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background/Introduction: Post-disaster settings are the most vulnerable settings where women are at risk of discontinuing their breastfeeding practices. Although challenges associated with continued breastfeeding during disasters and displacements are prevalent globally, they are particularly problematic in Pakistan. Pakistan is a low-middle income country where infant and child mortality rates are high. This country often faces disasters such as earthquakes and floods that exacerbate the discontinuation of breastfeeding. This study aims at exploring the facilitators and barriers to breastfeeding practices of internally displaced mothers residing in the disaster relief camps of Pakistan.

Methodology: Critical ethnography was employed as a study design to uncover the breastfeeding experiences of mothers in the post-disaster settings and situate their experiences within the intersections of maternal, sociocultural, economic and geo-political factors. The theoretical perspective that guided this study was the critical realist ontology and constructivist epistemology. Data were collected using multiple methods, including field observation, document analysis, and in-

depth interviews with 18 displaced mothers who were residing in disaster relief camps in northern Pakistan and were having young children aged 1 day to 36 months. Mothers were eligible to participate in the study regardless of their breastfeeding practices.

Findings: A wide range of maternal (micro-level), socio-cultural (meso level), economic (exo level) and geo-political (macro-level) factors, directly and indirectly, affect breastfeeding practices of displaced mothers residing in the post-disaster settings. Recommendations shared by the participants reflected their perspective on possible solutions to the encountered challenges surrounding breastfeeding practices of mothers residing in disaster relief camps.

Conclusion: Multi-layered, context-specific, and interdisciplinary interventions at the micro, meso, exo and macro levels are essential to promote, protect and support breastfeeding practices of mothers residing in the disaster relief camps.

Tuesday, March 23, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Rong Huang
Institution / Organization	Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital, University of Toronto
Address	60 Murray Street Toronto, Ontario, M5T 3L9 Canada
Phone Number	
E-mail Address	rongwong1119@gmail.com
Abstract Title	Large-for-gestational-age, leptin, adiponectin and adiposity in infancy
Speaker	Rong Huang
Author	Rong Huang, Yu Dong, Anne Monique Nuyt, Emile Levy, Shu-Qin Wei, Pierre Julien, William D. Fraser, and Zhong-Cheng Luo

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Large-for-gestational-age (LGA) is associated with elevated leptin concentrations at birth. It is unknown whether this association remains in infancy. We aimed to evaluate whether LGA is associated with circulating leptin and adiponectin levels in infancy, and assess their determinants.
Methods: In the prospective Canadian 3D birth cohort, we studied 70 LGA (birth weight >90th percentile) and 140 optimal-for-gestational-age (OGA, 25th-75th percentiles) control infants matched by maternal ethnicity, smoking and gestational age at delivery. We assayed circulating leptin, total and high molecular weight (HMW) adiponectin concentrations, and assessed adiposity indicators [body mass index (BMI), triceps and subscapular skinfold thickness] at age 2 year.
Results: LGA infants had higher BMI (P=0.008) and subscapular skinfold thickness (P=0.039) than OGA infants. However, there were no differences in leptin, total and HMW adiponectin concentrations. Leptin concentrations were positively associated with female sex (P<0.001), current BMI (P=0.021) and the sum of triceps and subscapular skinfold thickness z score (P=0.014) in infants at age 2 years, and negatively associated with maternal age (P=0.031) and white ethnicity (P<0.001). Female sex was associated with lower total (P=0.019) and HMW (P=0.054) adiponectin concentrations. BMI z score

was positively associated with total adiponectin in LGA infants only (P=0.005).
Conclusion: The study is the first to reveal that LGA is not associated with circulating levels of both leptin and adiponectin in infancy, maternal age is negatively associated with leptin in infancy, and there may be an LGA-specific association between BMI and adiponectin in infancy. Females may have lower adiponectin and higher leptin concentrations in infancy.

Thursday, March 25, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Nataliia Hula
Department	Physiology
Institution / Organization	University of Alberta
Address	232 Heritage Medical Research Centre (HMRC) Edmonton, Alberta, T6G 2S2 Canada
Phone Number	(780) 819-7934
E-mail Address	hula@ualberta.ca

Abstract Title	Placenta-Targeted Treatment During Hypoxic Pregnancies Improves Cardiac Tolerance to Ischemia/Reperfusion Insult in Adult Male and Female Rat Offspring
Speaker	Nataliia Hula
Author	Nataliia Hula, Floor Spaans, Jennie Vu, Anita Quon, Raven Kirschenman, Christy-Lynn M. Cooke, Tom J. Phillips, C. Patrick Case, Sandra T. Davidge

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: Fetal hypoxia is linked to fetal programming of cardiac dysfunction. Notably, susceptibility to cardiac ischemia/reperfusion injury (I/R) is increased in adult rat offspring exposed to prenatal hypoxia. We previously demonstrated that maternal treatment with the antioxidant MitoQ, encapsulated into placenta-targeted nanoparticles (nMitoQ), reduces placental oxidative stress. However, the effect of prenatal nMitoQ treatment on offspring cardiac function is unknown. Because calcium signalling plays a role in recovery from I/R, we hypothesized that maternal nMitoQ treatment during hypoxic pregnancies increases offspring tolerance to I/R by altering proteins involved in regulation of calcium cycling.
Methodology: Pregnant Sprague-Dawley rats were exposed to normoxia (21% O2) or hypoxia (11% O2) from gestational day (GD) 15 to GD21, and intravenously injected with saline or nMitoQ (100 μl of 125 μM) on GD15. Male and female offspring were aged to 4 months (n=4-6/group) and cardiac

susceptibility to I/R was assessed ex vivo. Cardiac proteins associated with calcium cycling (SERCA2α, (p)PLN, (p)CaMK II, PP2Ce) were assessed post-I/R with Western blotting. Data were analyzed by two-way ANOVA.
Results: Prenatal hypoxia decreased post-I/R cardiac recovery in males (71.5±6.5 vs 102.2±4.2%, p=0.0002) and females (62.9±7 vs 82.7±4.3%, p=0.01) compared to normoxia group, and nMitoQ prevented this in hypoxic males (96.5±3.5%, p=0.002) and females (84.8±2.3%, p=0.008). SERCA2a levels were decreased in hypoxic females only (p=0.04), without nMitoQ effect. Compared to saline, nMitoQ increased PLN levels (p=0.03) in male offspring, while increasing pPLN/PLN (p=0.02) in females. pCaMKII/CaMKII tended to be lower (p=0.051) and PP2Ce levels were higher (p=0.02) in nMitoQ-treated male group only.
Conclusion: A placenta-targeted treatment during hypoxic pregnancies improved offspring cardiac tolerance to I/R. While resulting in a similar functional improvement of post-I/R recovery, there were sex-specific differences in the effects of nMitoQ on expression/phosphorylation of cardiac proteins involved in calcium cycling in offspring born from hypoxic pregnancies.

Thursday, April 8, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Mr.
Full Name	Peter Anto Johnson
Department	Medicine
Institution / Organization	University of Alberta
Address	11455 43 Ave Edmonton, AB, T6J 0Y2 Canada
Phone Number	(780) 485-2430
E-mail Address	paj1@ualberta.ca

Abstract Title	Shedding light on sunlight exposure during pregnancy on offspring health: a scoping review
Speaker	Peter Anto Johnson
Author	Peter Anto Johnson, John Christy Johnson, Austin Mardon

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Sunlight exposure during pregnancy may be implicated in the physiological fetal development. Although several studies suggest the involvement of ultraviolet radiation-mediated vitamin D synthesis, current understandings of sunlight exposure effects during pregnancy remain incomplete.

Objective: To (i) summarize the existing body of research on maternal sunlight exposure during pregnancy on birth and long-term health outcomes and (ii) determine implications for therapeutics and public health policy.

Methods: We conducted a scoping review following PRISMA-ScR guidelines followed by a qualitative narrative synthesis. Databases including PubMed/MEDLINE, EMBASE and Google Scholar were screened, and no time, setting, or language restrictions were imposed on the search strategy. Primary research articles such as case studies, systematic reviews and meta-analyses, were included. Experimental and animal studies were excluded.

Results/Discussion: A total of 14 studies were included after screening and exclusion. Of the studies considering birth outcomes, the majority (5/8) demonstrated an association between sunlight exposure and reduced adverse birth outcomes (e.g., low birth weight, preterm births, small for gestational age, etc.), 2/8 studies showed no association, and 1/8 suggested a negative association between sunlight exposure and reduction of these adverse birth outcomes. Of the studies examining long-term health outcomes, sunlight exposure during pregnancy was shown to promote skeletal growth and development (2/6), and reduce the incidence of multiple sclerosis (2/6), asthma (2/6) and pneumonia (1/6). However, several of these studies used different methodologies and populations, making it difficult to compare findings. Based on these studies, we synthesized the importance of exposure at different stages of pregnancy, proposed mechanisms by which sunlight exposure effects developmental programming, epidemiological differences, and practical considerations prior to the implementation of public health policy recommendations.

Conclusion: While promising, clinical trials are warranted to support these recommendations.

Saturday, March 27, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Preeti Kar
Department	Radiology
Institution / Organization	University of Calgary
Address	11103 84 avenue, Apt 206 Edmonton, Alberta, T6G 2X4 Canada
Phone Number	(780) 708-0792
E-mail Address	preeti.kar@ucalgary.ca

Abstract Title	Alcohol and substance use in pregnancy during the COVID-19 pandemic
Speaker	Preeti Kar
Author	Preeti Kar, Lianne Tomfohr-Madsen, Gerald Giesbrecht, Mercedes Bagshawe, Catherine Lebel

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: The impact of the COVID-19 pandemic on rates of alcohol/substance use has been a topic of concern, as it may be a coping mechanism in response to stress, loneliness and/or disruptions to employment. Furthermore, alcohol and substance use can affect babies' development with long-term consequences. Pregnant women are currently experiencing unusually high rates of anxiety and depression symptoms, which may impact their alcohol/substance use. We aimed to investigate alcohol, cannabis, tobacco, and illicit drug use in pregnant individuals to understand mental health and COVID-19 pandemic predictors of use.

Methods: In the Pregnancy during the COVID-19 Pandemic, 7470 pregnant individuals completed a survey including current alcohol and substance use during pregnancy. Participants were asked about depression symptoms using the Edinburgh Depression Scale and anxiety symptoms using the PROMIS Anxiety Adult 7-item short form. COVID-19 concerns assessed included: how much they worry about COVID-19 threatening their baby's life and their own life, their worries about care for themselves or

their baby, their feelings of social isolation, and any financial difficulties. Linear regression was used to assess how mental health symptoms and COVID-19 concerns predicted amount of use.

Results: 6.7% of pregnant individuals reported using alcohol, 4.3% reported cannabis use, 4.9% reported tobacco use, and 0.3% reported illicit drug use. Individuals with greater financial difficulties ($p<0.001$) or greater depression symptoms ($p<0.001$) reported more cannabis use, tobacco use, and co-use of multiple substances.

Discussion: COVID-19-related financial difficulties and symptoms of depression were associated with cannabis, tobacco and co-use of substances. This is worrisome given the risk of poor perinatal outcomes and neurodevelopmental outcomes for babies. Maintaining positive relationships between pregnant individuals and health and social systems may reduce use. This includes access to wrap-around services during the pandemic addressing perinatal and mental health but also socioeconomic sources of stress to mitigate poor outcomes.

Wednesday, March 24, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Maryam Kebbe
Institution / Organization	Pennington Biomedical Research Center
Address	5500 Perkins Road Baton Rouge, Louisiana, 70808 United States
Phone Number	(225) 999-2939
E-mail Address	maryam.kebbe@pbrc.edu

Abstract Title	How do maternal eating behaviors influence attitudes toward infant feeding among breastfed and formula-fed infants in a low-income population?
Speaker	Dr. Maryam Kebbe
Author	Maryam Kebbe, PhD, Abby D. Altazan, MSc, Robbie A. Beyl, PhD, Anne L. Gilmore, PhD, RD, LD, Leanne M. Redman, PhD

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background/Introduction: Eating behaviors are established early in life, influence infant development and health, and likely originate with the mother. We examined if maternal eating behaviors influenced attitudes towards infant feeding styles and whether these associations differed by infant feeding mode (breastfeeding and formula-feeding).

Methodology: This was an observational study in 35 low-income mother-infant dyads enrolled in a federal assistance program that supports healthcare and nutrition of low-income pregnant and postpartum women. Postpartum women (≥18 years old, 25≤BMI<40 kg/m2) completed the Eating Inventory to assess maternal eating behavior (dietary restraint, disinhibition, and perceived hunger) and the Infant Feeding Styles Questionnaire (restrictive feeding, responsive feeding, and pressuring/overfeeding), 8 weeks after delivery. Linear models with fixed effects were computed with maternal age, BMI, and maternal eating behavior as covariates using SPSS ($p<0.05$ to indicate significance).

Results: Thirty-four percent of the mothers were breastfeeding (n=12) and 66% were formula-feeding (n=23). Infant feeding styles were not predicted by maternal eating behaviors (all p>0.05). In mothers who breastfed, maternal dietary restraint was positively associated with infant pressuring/overfeeding (β=0.91, p<0.05) and was different from those in the formula fed group (Δ=1.37, p=0.02). In addition, maternal disinhibition was negatively associated with restrictive infant feeding (β=-0.53, p<0.05) and was different from those in the formula fed group (Δ=-0.95, p=0.003). Comparatively, in mothers who formula-fed, restrictive infant feeding was predicted by maternal disinhibition (β=0.42, p<0.01; Δ=-0.95, p=0.003) and maternal perceived hunger (β=0.43, p<0.01; Δ=0.71, p=0.007).

Conclusions/Discussion: Maternal eating behavior is associated with infant feeding styles based on feeding modality. We found infant feeding styles to be contrary to hypothesized practices among breastfeeding (responsive) and formula-feeding (pressuring) mothers with healthy eating behaviors. Interventions educating mothers on how their own eating behaviors have the potential to influence eating behaviors and subsequent health of their children are needed.

Friday, April 9, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Ms.
Full Name	Katherine Kennedy
Institution / Organization	McMaster University
Address	1280 Main St W, HSC 4N75 HAMILTON, Ontario, L8S4L8 Canada
Phone Number	
E-mail Address	kennek6@mcmaster.ca
Abstract Title	Meconium Does Not Have a Detectable Microbiota Prior to Birth
Speaker	Katherine Kennedy
Author	Katherine M. Kennedy, Max J. Gerlach, Thomas Adam, Markus M. Heimesaat, Laura Rossi, Michael G. Surette, Deborah M. Sloboda, Thorsten Braun

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

BACKGROUND: A clear relationship exists between the host and residing gut bacteria on metabolism and immunity. When this relationship begins however is unclear; in utero colonization remains a highly contentious topic.
METHODS: We investigated whether bacteria could be detected in meconium prior to birth. Fetal meconium (n = 20) was collected by rectal swab during elective breech Cesarean sections without labour prior to antibiotics and compared to technical and procedural controls (n = 5), first-pass meconium (neonatal meconium; n = 14), and infant stool (n = 25). An additional meconium samples were collected for aerobic and anaerobic culture analysis performed under standard hospital pathology conditions. Genomic DNA was isolated by phenol-chloroform extraction and the combined V3-V4 region of the 16S rRNA gene was amplified for 30 and 40 PCR cycles. Amplicons were sequenced using the Illumina MiSeq platform (2x300bp). Amplicon Sequence Variants (ASVs) were inferred using DADA2 and taxonomy was assigned using the RDP Classifier against the Silva 132 reference database. Beta diversity was calculated using the Bray Curtis dissimilarity metric in Phyloseq and visualized via Principal Coordinate Analysis (PCoA) ordination.
RESULTS: Unlike first-pass meconium, we did not detect a microbial signal distinct from negative controls in fetal meconium. Additionally, positive aerobic (n = 10 of 20) and anaerobic (n = 12 of 20) clinical cultures of fetal meconium (13 of 20 samples positive in at least one culture) were identified as likely skin contaminants, most frequently Staphylococcus epidermidis, and not detected by

sequencing in most samples (same genera detected by culture and sequencing in 2 of 13 samples with positive culture).
CONCLUSION: We conclude that fetal gut colonization does not occur before birth, and that microbial profiles of neonatal meconium reflect populations acquired during and after birth.

Thursday, April 8, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Ms.
Full Name	Zuleika C. L. Leung
Department	Physiology and Pharmacology
Institution / Organization	Western University
Address	DSB 00066 - 1151 Richmond St. London, ON, N6A 3K7 Canada
Phone Number	(647) 984-5808
E-mail Address	cleun257@uwo.ca

Abstract Title	Oleic acid rescues autophagy changes induced by palmitic acid during mouse preimplantation development
Speaker	Zuleika Leung
Author	Zuleika C. L. Leung, Michele D. Calder, Dean H. Betts, Basim A. Rafea, Andrew J. Watson

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background / Introduction:
Obesity-induced hyperlipidemia is one of the main factors for female infertility in Canada. Our group previously found that palmitic acid (PA) impairs blastocyst development while oleic acid (OA) alleviates such effects. Autophagy is essential in preimplantation development; however, it is unknown whether hyperlipidemia affects autophagic mechanisms. Therefore, it is hypothesized that PA will alter autophagy during early mouse embryonic development; and that the subsequent effects will be reversed by OA.

Methodology:
Pools of 20-25 mouse embryos (n=3) were collected at the two-cell stage from gonadotrophin super-ovulated and mated female CD1 mice. The embryos were treated with 100 µM PA and 250 µM OA, alone and in combination, and KSOMaa media alone (control) for up to 48 hours in vitro.

Results:
PA-treated embryos showed significantly lowered blastocyst development, notably arrested at the 8-cell stage. OA-treated and PA- and OA-treated groups displayed no differences in blastocyst development compared to control.

PA-treated embryos showed a significant increase in LC3-II abundance at 48 hours of treatment.
OA significantly lowered LC3-II abundance compared to the PA-treated group after 30 hours. The addition of OA to PA treatment significantly lowered LC3-II abundance after 48 hours of treatment, but not the other time points.
Control, OA-treated, and PA- and OA-treated groups displayed no significant differences in LC3-II levels compared to each other after 18, 24, and 48 hours of development.
No change in mRNA levels of autophagic markers (Bcln1, ATG3, ATG5, and LC3) relative to the control group was observed after 48 hours of exposure to PA and OA, alone and in combination.

Conclusion / Discussion:
PA induced changes in autophagic marker expression but those effects were reversed by the addition of OA. OA itself had no effects on autophagy mechanisms. Ultimately, we aim to assist obese patients by offsetting the negative effects of hyperlipidemia on preimplantation development.

Thursday, March 25, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Kathryn Yvonne Manning
Department	Radiology
Institution / Organization	University of Calgary
Address	2908 6th Ave. NW Calgary, Alberta, T2N0Y4 Canada
Phone Number	(519) 495-7866
E-mail Address	kathryn.manning@ucalgary.ca

Abstract Title	Prenatal maternal distress during the COVID-19 pandemic and its effects on infant brain connectivity
Speaker	Kathryn Manning
Author	Kathryn Y. Manning, Xiangyu Long, Lianne Tomfohr-Madsen, Gerald Giesbrecht and Catherine Lebel

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: Roughly 25% of women experience elevated anxiety and/or depression during their pregnancy; the ongoing COVID-19 pandemic has significantly increased these rates. Prenatal depression and anxiety are associated with brain alterations in children. Here we studied infants from the Pregnancy during the COVID-19 Pandemic Study (http://www.pregnancyduringthepandemic.com) who underwent MRI in Calgary. We aimed to determine the relationship between infant amygdala functional and structural connectome measures and maternal prenatal distress.
Methodology: Pregnant women were recruited to complete an online questionnaire (Edinburgh Depression Scale, PROMIS Anxiety, Social Support Effectiveness questionnaire (SSEQ) and pregnancy-related anxiety questionnaire). Standard scores from these instruments were combined using principal component analysis to quantify prenatal distress. Women who had delivered infants in the Calgary area at full term (≥37 weeks) were invited to bring their infants (2-3 months) to the Alberta Children's Hospital for neuroimaging (n = 55, natural sleep, GE 3T MR750w) including diffusion imaging and resting state functional MRI (rs-fMRI). Diffusion data (n=30) were processed (ExploreDTI) and diffusion

metrics extracted from bilateral uncinate fasciculi and fiber bundles connecting the amygdala to the prefrontal cortex. Rs-fMRI processing was conducted (FSL) and connectivity between the amygdala and prefrontal regions was calculated. Linear mixed effects models explored the relationship between DTI and rs-fMRI metrics and the composite prenatal maternal psychological distress controlling for sex, age, SSEQ and maternal education.
Results: The fractional anisotropy (FA) in both tracts was significantly related to the prenatal distress composite score. There was a significant interaction between prenatal distress and SSEQ where mothers with lower SSEQ demonstrated a positive FA-distress relationship where higher prenatal distress was associated with higher FA ($p < 0.05$). Functional connectivity did not demonstrate this relationship.
Discussion: Premature white matter microstructural development is related to higher prenatal distress experienced during pregnancy in mothers with relatively lower quality social support.

Wednesday, March 24, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Shelby Louise Oke
Department	Physiology and Pharmacology
Institution / Organization	The University of Western Ontario
Address	1151 Richmond Street , Dental Sciences Building 2027 London, Ontario, N6A 3K7 Canada
Phone Number	(519) 872-5769
E-mail Address	shelby.oke@hotmail.ca

Abstract Title	In utero exposure to D9-tetrahydrocannabinol leads to rapid postnatal catch-up growth and hepatic dysmetabolism
Speaker	Shelby L. Oke
Author	Oke SL, Lee K, Papp R, Kiser P, Laviolette SR, Hardy DB

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Postnatal catch-up growth exacerbates the inverse relationship between birth weight and long-term metabolic disease. We have previously demonstrated that catch-up growth following perinatal protein deficiency leads to impaired mitochondrial function and hepatic dysmetabolism in postnatal life. Given that this occurs exclusively following catch-up growth, we have implemented an in utero model of D9-tetrahydrocannabinol (D9-THC, the psychoactive component of cannabis) exposure to determine if catch-up growth promotes impaired mitochondrial and liver function in an alternate model of fetal growth restriction (FGR). We hypothesized that D9-THC-exposed FGR offspring would undergo catch-up growth, leading to compromised mitochondrial and hepatic function.

Methodology: Pregnant rat dams received daily dose of vehicle or D9-THC (3 mg/kg i.p.) from embryonic day (E) 6.5 through E22. At birth, body weight (BW) and organ to BW ratios were recorded. Hepatic and mitochondrial outcomes were assessed via immunohistochemistry (IHC), lipid analysis, and western immunoblotting at six months. IHC images were subject to blinded pathological analysis, while immunoblot data were analyzed via an unpaired Students' t-test.

Results: D9-THC offspring exhibited decreased BW and liver to BW ratio, followed by whole body and hepatic catch-up growth by three weeks. At six months, D9-THC offspring exhibited increased adipose to BW ratio, suggestive of dyslipidemia. Male D9-THC offspring displayed increased hepatic triglycerides ($p<0.05$), concomitant with increased hepatic diglyceride acyltransferase 1 (DGAT1) protein ($p<0.05$). Furthermore, both male and female D9-THC offspring demonstrated decreased hepatic PAS staining, indicating reduced glycogen stores. Male D9-THC offspring exhibited increased protein abundance of p66Shc ($p<0.05$) and mitochondrial complexes I, III, and V ($p<0.05$), along with decreased SOD1 ($p<0.05$), suggesting mitochondrial dysfunction.

Conclusion: Overall, our data indicate that catch-up growth may disrupt hepatic metabolism and mitochondrial function independent of gestational insult. It also suggests that D9-THC-exposed offspring may be more vulnerable to development of the metabolic syndrome later in life.

Thursday, March 25, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Mr.
Full Name	Justin Okeke
Department	Obstetrics & Gynecology
Institution / Organization	Mount Sinai Hospital
Address	700 University Avenue, Rm. 8-926 Toronto, ON, M5G 1X6 Canada
Phone Number	(647) 679-5354
E-mail Address	justin.okeke@sinaihealth.ca
Abstract Title	Impact of the COVID-19 pandemic on mental health of women during pregnancy and post-partum
Speaker	Justin Okeke
Author	Justin Okeke (Department of Obstetrics and Gynecology, Sinai Health System), Levitan RD (Mood and Anxiety Disorders Program, Centre for Addiction and Mental Health; Department of Psychiatry, University of Toronto), Murphy K (Department of Obstetrics and Gynecology, Sinai Health System; Department of Obstetrics and Gynecology, University of Toronto), Foshay K (Department of Obstetrics and Gynecology, Sinai Health System), Lye SJ (Department of Obstetrics and Gynecology, Sinai Health System; Department of Obstetrics and Gynecology, University of Toronto; Lunenfeld-Tanenbaum Research Institute, Sinai Health System; Department of Physiology, University of Toronto), Knight JA (Lunenfeld-Tanenbaum Research Institute, Sinai Health System; Dalla Lana School of Public Health, University of Toronto), Matthews SG (Department of Obstetrics and Gynecology, University of Toronto; Lunenfeld-Tanenbaum Research Institute, Sinai Health System; Department of Physiology, University of Toronto)

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: In March 2020, the novel coronavirus disease 2019 (COVID-19) outbreak was declared a global pandemic, resulting in massive social and economic disruption, making the impact of the pandemic on mental health relevant to public health. We assessed the potential impact of the COVID-19 pandemic on the mental health of pregnant women enrolled in the Ontario Birth Study (OBS), in the year before and during the first year of the pandemic, at different pregnancy time points. We hypothesized a decline in mental health associated with the pandemic.

Methodology: The OBS is a prospective cohort study of mothers and infants receiving antenatal care at Mount Sinai Hospital, Toronto. Questionnaires are sent to participants in early pregnancy (12-16 weeks), late pregnancy (24-28 weeks) and postnatally (6-10 weeks). The current analysis includes data from 650 OBS participants (418 in early pregnancy, 379 in late pregnancy, and 379 postnatal), submitted between March 1, 2019 and Feb 28, 2021). Submissions between March 1, 2019 – Feb 28, 2020 were grouped as pre-pandemic, while responses from March 1, 2020 - February 28, 2021 were considered pandemic. We compared the mean scores of depression (PHQ-2) and anxiety (GAD-2) before and during the pandemic with t-tests.

Results: Few women were above the clinical cut-off scores during either time period. There were no differences in depression or anxiety scores from women in early or late pregnancy. However, in the early postnatal period, there was a marginally significant increase in anxiety ($p = 0.07$, $d = 0.23$) and a significant increase in depression scores ($p = 0.004$, $d = 0.38$) during the pandemic compared to the pre-pandemic period.

Conclusion: There was no significant impact of the pandemic on maternal depression or anxiety during pregnancy. This may indicate a level of resilience during pregnancy. In contrast, the pandemic had a profound negative influence on mental health scores during the postnatal period.

Barriers to Nutritional Pregnancy Preparation and Support Needs in Women and Partners: Qualitative Study based on the Theoretical Domains Framework

[1]Fareeha Quayyum, [1]Stephan U Dombrowski, PhD.

[1] Faculty of Kinesiology, University of New Brunswick, Canada

Purpose: Eating behaviours prior to conception are critical in determining the health of the offspring at birth and throughout life. Women and their partners of childbearing age often follow a nutritionally-poor pre-conception diet. Nutritional support before pregnancy has potential to improve the health of future offspring. This study examined barriers to nutritional preparation for pregnancy and perceived support needs of women and their partners of childbearing age.

Design: Qualitative interviews based on the Theoretical Domains Framework.

Setting: Online.

Participants: Eligible individuals were i) New Brunswick residents (all genders), ii) over 19 years old, and iii) intended to have offspring in the future.

Methods: Interviews were conducted via online instant messenger and analyzed thematically.

Results: Interviews of participant (n=19, age: 19-23 years, 14 women) gave rise to five key theoretical domains: lack of knowledge; lack of beliefs about capabilities; suboptimal environmental context and resources; unfavourable social influences; and restrictive social roles. Suggestions to address pregnancy preparation support needs included: healthcare professional consultations; accessible and credible references; increasing access to healthy food; proactive engagement; and gender-specific support.

Conclusion: Women and their partners called for various types of preconception support to address identified barriers, ranging from healthcare professional advice and credible informational resources to broader interventions such as making healthy food more affordable and normalizing discussion of preconception health throughout the life course.

Wednesday, March 24, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Nicole Rodriguez
Department	Pediatrics
Institution / Organization	University of Alberta
Address	11536 127 ST., NW EDMONTON, AB, T5M0V3 Canada
Phone Number	(780) 297-1184
E-mail Address	nicolean@ualberta.ca

Abstract Title	Maternal depression impacts infant gut microbial composition dependent on breastfeeding status
Speaker	Nicole Rodriguez
Author	Nicole Rodriguez, Hein M. Tun, Catherine J. Field, Piushkumar J. Mandhane, James A. Scott, Anita L. Kozyrskyj

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction:
Depressive symptoms are common during pregnancy and are estimated to affect 7% to 20% of pregnant women. Accumulating research evidence supports the association between maternal physical health factors to infant gut health. However, specific maternal prenatal psychosocial factors and their effect on infant intestinal microbiota remains an area that is not well understood.
The objective of the current study is to examine the effect of maternal prenatal psychosocial and physical health on the microbial gut compositions of infants at 3-4 months of age. Specifically, we will investigate the association of maternal prenatal depression status within stratified breastfeeding groups on the infant gut microbiota.

Methods:
The study used a subsample of 996 infants (mean age: 3.7 ± 1.0 months) from the CHILD Cohort Study. Maternal depression was assessed using self-reported questionnaires at the time of recruitment

during pregnancy, and/or 3 months postpartum. Hospital records were used to provide information related to other covariates. The infant gut microbiota was profiled using 16S rRNA targeted-amplicon and characterized by microbial beta-diversity (Bray-Curtis distance) to represent community composition.

Result:
Stratification by infant diet revealed that maternal depression had the strongest effect on infant gut microbial beta-diversity in the partially breastfed ($p = 0.023$) and the non-breastfed group ($p = 0.022$), adjusted for maternal prenatal diet, birth mode, and other covariates. Maternal prenatal diet was crudely associated with gut microbial beta-diversity of non-breastfed infants but not in the adjusted model with maternal depression.

Conclusion:
Maternal depression impacts infant gut microbial diversity, dependent on breastfeeding status at 3 to 4 months. Changes in the microbial composition of infants born to depressed mothers are known to be predictive of metabolic diseases in later life. Early cessation of breastfeeding among depressed moms may ultimately result in a compromised immunity and negative developmental outcomes for infants.

Saturday, April 3, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Laura Paola Rojas
Institution / Organization	University of Calgary
Address	25 Rocky Vista Circle NW Calgary, Alberta, T3G5B7 Canada
Phone Number	(403) 389-5558
E-mail Address	laura.rojas@ucalgary.ca

Abstract Title	Fear of COVID-19 Among Pregnant Canadian Women
Speaker	Laura Rojas
Author	Laura Rojas, Stuti Patel, Lianne Tomfohr-Madsen, Catherine Lebel, Gerry Giesbrecht

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: Morbidity and mortality related to COVID-19 among pregnant individuals and neonates is low, but fear of COVID-19 has not been described. Sustained fear has the potential to increase obstetric risk and psychological impairment in pregnant individuals and their offspring.

Methods: This study aimed to (1) describe fear of COVID-19 during pregnancy and (2) identify factors and characteristics that increase fear of COVID-19. 8278 pregnant Canadians recruited between April - October 2020 rated (on a scale of 0-100) fear that (1) COVID-19 was a threat to their life, (2) the life of their unborn baby, or (3) that their unborn baby would be harmed by exposure to COVID-19. A series of univariate ANOVAs identified sociodemographic, obstetric, and health factors associated with fear of COVID-19.

Results: Mean fear scores for threat to own life, threat to life of baby, and threat of harm to baby were 44, 52, and 63, respectively. 23 individuals had confirmed COVID-19 infections and 184 had suspected infections. Fear of COVID-19 did not differ between infected, suspected and not infected participants. Fear of COVID-19 increased with lower income, lower education, being an ethnic minority, nulliparity, previous anxiety disorder, having a chronic health condition, or being from

Maritime provinces. Time since onset of the pandemic was not associated with fear.

Conclusion: Women with the greatest sociodemographic risk factors are most fearful of COVID-19. The fact that fear of COVID-19 has not decreased over time suggests a need for public health messaging about the low risk of morbidity among pregnant women and neonates. Psychological distress increases obstetric, psychological, and physical morbidity in pregnant women and their offspring. This is important because the morbidity caused by fear of COVID-19 is likely to create a greater burden of disease than the virus itself.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Amanda Lee Rowlands
Department	Faculty of Health Sciences
Institution / Organization	Simon Fraser University
Address	8888 University Drive Burnacy, BC, V5A 1S6 Canada
Phone Number	(604) 836-8232
E-mail Address	amanda_rowlands@sfu.ca

Abstract Title	Hypothalamic-pituitary-adrenal axis activity and sleep patterns across stages of the adolescent transition in a group of Mayan girls – A preliminary analysis
Speaker	Amanda Rowlands
Author	A Rowlands; KG Salvante; L McKinnon; DR Samson; PA Nepomnaschy

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Organisms face continuous energetic trade-offs between growth, maintenance, and reproduction. Responding to social and physical challenges demands energy, which is often derived from postponable physiological tasks such as reproduction and development. The role of sleep and stress as mediators of energetic trade-offs during the reproductive maturation transition among girls is still unclear.
Methods: To explore it, we analyzed data from 19 Mayan adolescent girls (12 to 15 years; avg = 13.5 years) from Guatemala, collected over a 19-day period in 2017. Indicators: sleep quotas (total sleep time, TST), biomarkers of stress (first morning urinary (FMU) cortisol), and reproductive stage (pre-menarche, early transition, advanced transition).
Statistical approach: ANOVA model of effects of cortisol, and reproductive stage on sleep.
Results: TST among and within girls ranged from 235-548 minutes. Cortisol levels ranged from 3.8-633 ng/ml. Cortisol and reproductive stage both had a significant, independent effect on total sleep time.

Sleep was negatively associated with cortisol level. There was a significant mean difference of total sleep time between pre-menarche girls and early transition girls (p=0.037), where early transition girls had poorer sleep compared to pre-menarche girls.
Discussion: These findings may reflect the shifts in energy allocation from somatic growth to reproductive maturation in girls entering their transition. Next we will include biomarkers of energy in the model, and will explore interactions among variables with energy, to better understand the role of sleep on energy mobilization during the reproductive adolescent transition.

Monday, March 29, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Ritika Sharma
Department	Women's Clinic and Polyclinic
Institution / Organization	Klinikum Rechts Der Isar, Technical University Munich
Address	Ismaninger Str.22, Bau 523, 2.O.G, Zi 2.17 Munich, Bavaria, 81675 Germany
Phone Number	(+49) 176-77246377
E-mail Address	ritika.sharma@helmholtz-muenchen.de
Abstract Title	Epigenome wide association study in prenatally stressed newborns: FELICITy study
Speaker	Ritika Sharma
Author	Ritika Sharma,1,2, Camilla Zelgert 2, Peter Zimmermann2, B Fabre 5 , Rory Wilson1, Melanie Waldenberger1, James W. MacDonald3, Theo Bammler3,Martin G Frasch3,Silvia M. Lobmaier2, Marta C. Antonelli2, 4 1Research Unit of Molecular Epidemiology, Inst. of Epidemiology, Helmholtz Zentrum Munich, Neuherberg, Germany.2 Dept. of OBGYN, Technical Univ of Munich, Munich, Germany.3Dept. of OBGYN & CHDD, Univ of Washington, Seattle, WA. 4IBCN, Facultad de Medicina, Universidad de Buenos Aires, Buenos Aires, Argentina, 5. INFIBIOC, Facultad de Farmacia y Bioquímica, UBA. Buenos Aires. Argentina.

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Prenatal stress (PS) affecting children before, during, and after birth may program the physiological responses of the infant and their life-long epigenome. Thus, we aimed to develop a biomarker panel from easily obtainable neonatal buccal salivary DNA as an early non-invasive measure of the impact of PS on infants.

Method: Pregnant women were screened for stress exposure using Cohen Perceived stress scale-10 (PSS-10) and were classified into stressed (SG, PSS-10≥19, n= 55) and control group (CG, PSS-10<19, n=55) matched for parity, maternal, and gestational age. Maternal and fetal heart rate coupling derived from trans-abdominal electrocardiogram recordings were quantified yielding fetal stress index (FSI) (PMID: 31781889). FSI reflects the fetal autonomic nervous system's (ANS) coordination dynamics in response to maternal stimuli and is hence reflecting the impact of PS on fetal brain development. Upon delivery, we collected newborn cord blood and saliva. DNA was extracted from saliva samples (n=114) and methylation was measured using the EPIC array. To identify associations between FSI and methylation, regression models adjusting for confounders (sex, gestational age, and surrogate variables) were run.

Results: Although no CpG withstood correction for multiple testing, methylation at one CpG site - cg16692227 on chromosome 8 (p = 5.66E-07) was suggestively associated with FSI whose gene annotates for the protein SAMD12 which is expressed in the brain.

Conclusions: Our study found weak evidence of an association between neonatal DNA methylation in saliva and FSI. We observed that the top associations are related to neurobiological functions. These results suggest that FSI may serve as a prenatal ANS biomarker of maternal-foetal stress transfer. Additionally, our findings suggest that neonatal epigenetic marks are not revealed at birth. This may explain why we saw no strong association at this time point. Reassessing differential methylation in two years old infants in a follow-up provides an opportunity for early psychological interventions to reverse any lasting programming effects on neurodevelopment.

Tuesday, April 6, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Katherine Anne Silang
Department	Psychology
Institution / Organization	University of Calgary
Address	Suite 521, 4135 University Avenue NW, 521 Calgary, Alberta, T3B6K8 Canada
Phone Number	(416) 670-3426
E-mail Address	katherine.silang@ucalgary.ca

Abstract Title	Effectiveness of eHealth Interventions to treat Depression, Anxiety and Insomnia during Pregnancy: A Systematic Review and Meta-Analysis
Speaker	Katherine Silang
Author	Katherine A. Silang, Pooja R. Sohal, Katherine Bright, Jennifer Leason, Leslie Roos, Catherine Lebel, Gerald Giesbrecht, Lianne M. Tomfohr-Madsen

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Pregnancy is associated with an increased risk for developing depression, anxiety and insomnia. eHealth interventions provide a promising and accessible treatment alternative to face-to-face intervention. The objective of this systematic review and meta-analysis was to determine the effectiveness of eHealth interventions to prevent and treat depression, anxiety and insomnia during pregnancy. Secondary aims were to identify demographic and intervention moderators of effectiveness. Methods: Five databases (PsycINFO, Medline, CINAHL, Embase, Cochrane) were searched from inception to May 2020. Terms related to eHealth, pregnancy, randomized controlled trials, depression, anxiety, and insomnia were included. RCTs were included if they reported (a) an eHealth intervention for (b) the prevention or treatment of depression, anxiety or insomnia (c) in pregnant women or partners. Study screening, data extractions and quality assessment were conducted independently by

two reviewers. Random effects meta-analyses of pooled effect sizes were conducted to determine the effect of eHealth interventions on prenatal mental health. Meta-regression analyses were conducted to identify potential moderators.
Results: The results indicated that during pregnancy, eHealth interventions showed small to moderate effect sizes for preventing and treating anxiety and depression and a large effect size for treating insomnia symptoms. No significant moderators were detected.
Conclusion: eHealth interventions are an accessible and promising resource for treating anxiety, depression and insomnia during pregnancy. However, more research is necessary to increase the clinical significance of the effects.

Monday, April 12, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Derrick Ssewanyana
Institution / Organization	Alliance for Human Development, Lunenfeld-Tanenbaum Research Institute, Sinai Health System
Address	Lunenfeld-Tanenbaum Research Institute, 600 University Avenue Toronto, Ontario, M5G 1X5 Canada
Phone Number	
E-mail Address	ssewanyana@lunenfeld.ca
Abstract Title	Does Prenatal vitamin intake and maternal prenatal psychological distress have impact on children's cognitive development?
Speaker	Derrick Ssewanyana
Author	Derrick Ssewanyana, Julia A. Knight, Stephen G. Matthews, Stephen J. Lye, Rayjean J. Hung

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Maternal prenatal psychological distress (PPD), that is, depression and/or anxiety during pregnancy, is associated with adverse child neuro-development. Plausibly, the daily intake of prenatal vitamin during 3 months pre-conception and in the first trimester may ameliorate the effects of PPD on cognitive development of the offspring.
Methods: Pregnant women completed questionnaires at 12-16 (LSQ1) and 28-32 weeks (LSQ2) of gestation in the Ontario Birth Study. Information about prenatal vitamin intake 3 months before pregnancy and during the first trimester was collected in LSQ1. PPD was assessed using the Patient Health Questionnaire-4 (PHQ-4) in LSQ1 and 2. Maternal age at delivery, child sex, birth weight, and gestational age were extracted from medical charts. Child cognitive development at 4 years was assessed using the NIH Toolbox Early Childhood Cognition Battery. Poor cognition was termed as age-corrected composite cognition scores below the 10th percentile. Poisson regression models with robust error variance were used to investigate the associations between PPD and/or prenatal vitamin intake and children's cognitive development. A total of 437 children, 52% males and aged 56 months

(±2.5) were assessed.
Results: Mild to severe PPD was experienced by 27% of pregnant women and 51% reported daily intake of prenatal vitamins. Recurrent episodes of PPD were associated with poorer cognition in children (IRR=1.45, 95%CI: 1.0-2.1, P=0.04). Daily intake of prenatal vitamins was not significantly associated with cognition (IRR=1.67, 95%CI: 0.9-3.2). However, children born to women who reported

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Carmen A Tessier
Department	Department of Pediatrics
Institution / Organization	University of Alberta
Address	90, 49547-RR243 Leduc County, Alberta, T4X1Z8 Canada
Phone Number	(1) 780-8680156
E-mail Address	ctessier@ualberta.ca

Abstract Title	Breastfeeding Duration and Infant C. difficile Colonization Sequentially Mediate the Impact of Prenatal Depression on Child Cognitive Scores: A Novel Pathway Exploring the Early Gut-Brain Axis
Speaker	Carmen Tessier
Author	Tessier CA, Pei J, Morales-Lizcano NP, Azad MB, Moraes TJ, Turvey SE, Subbarao P, Scott JA, Mandhane PJ, Kozyrskyj AL.

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction
Colonization of the infant gut with Clostridioides difficile (C. difficile) is on the rise. We previously reported that prenatal depression was associated with decreased duration of breastfeeding and that breastfeeding can reduce the likelihood of C. difficile colonization. Moreover, recent evidence is emerging on the impact of gut inflammation on brain development. Therefore, this study aimed to examine the impact of prenatal depression on child cognition by exploring a novel pathway through breastfeeding and infant C. difficile colonization.

Methods
This study used a substudy of 336 term infants from the Canadian Healthy Infant Longitudinal Development (CHILD) birth cohort. Prenatal depression was measured using the CES-D at 36 weeks of

gestation. Exclusive breastfeeding duration and fecal samples were collected at 4 months during a home assessment with analysis of C. difficile performed using qPCR. Child cognition was assessed using the BSID-III administered at 2 years. Structural equation modelling was used to test the direct and indirect effects using STATA v16.

Results

In our sample, 42% of the infants were colonized with C. difficile at four months of age. During their third trimester of pregnancy, 9.8% of mothers experienced clinically significant depression. We found that prenatal depression marginally decreased cognitive scores at 2 years of age through the indirect path of decreasing breastfeeding duration which increased colonization with C. difficile (Coef: -1.43; 95%CI= -3.04, 0.17; p=0.080). A second indirect pathway revealed that exclusive breastfeeding duration significantly increased child cognitive scores at 2 years of age by decreasing colonization of C. difficile (Coef: 0.16; 95%CI= -0.19, -0.02; p=0.012).

Conclusion

Our novel pathway suggests that mothers with prenatal depression tended to exclusively breastfeed for a shorter duration, increasing infants' colonization with this pathobiont, which resulted in lower cognitive scores later in childhood. Interventions should focus on promoting exclusive breastfeeding duration during infancy.

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Mr.
Full Name	Mateusz Marek Tomczyk
Department	Pharmacology and Therapeutics
Institution / Organization	Children's Hospital Research Institute of Manitoba
Address	631-715 McDermot Avenue Winnipeg, Manitoba, R3E 3P4 Canada
Phone Number	
E-mail Address	tomczyk3@myumanitoba.ca

Abstract Title	Gestational Diabetes Exposure Altered Cardiac Mitochondrial Protein Acetylation in the Mouse Offspring
Speaker	Mateusz Tomczyk
Author	Mateusz M Tomczyk, Bo Xiang, John A. Wilkins, Vernon W. Dolinsky

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Gestational diabetes mellitus (GDM) affects 5-10% of pregnancies and puts offspring at elevated risk of cardiometabolic complications. Previously we showed that GDM induced cardiac hypertrophy and mitochondrial dysfunction in the offspring. Reduced cardiac energy production resulting in an inability to pump blood as well as increased oxidative stress contributes to the development of diabetic cardiomyopathy. SIRT3 is the main mitochondrial lysine deacetylase that controls the acetylation of mitochondrial proteins and their enzymatic activity. SIRT3 protein levels are reduced in the hearts of GDM offspring. We hypothesized that decreased SIRT3 in the hearts of GDM offspring alters the acetylation of mitochondrial proteins and contributes to mitochondrial dysfunction.

Methods: Female mice were fed a high-fat high-sucrose (HFS) diet for 6 weeks prior to mating in order to induce GDM. Lean controls were fed a low fat (LF) diet. Post-weaning, male offspring were randomly assigned to LF or HFS diets. Mice were sacrificed and cardiac mitochondria were isolated. An anti-

acetylated lysine antibody was used to enrich for tryptic digested peptides containing Acetyl-K that were analyzed by mass spectrometry (QTRAP LC-MS/MS, n=5).

Results: A total of 1034 unique peptides were Identified. GDM significantly altered acetylation of 93 peptides and postnatal HFS diet altered acetylation on 56 peptides. These corresponded to proteins involved in cardiac energy production and oxidative stress resistance. Specifically, offspring of GDM dams exhibited hyperacetylation of Idh2 (K166) and Atp5h(K32) which was attenuated in offspring from Lean dams ($p<0.05$), suggesting a maternal effect. Postnatal HFS diet was associated with hyperacetylation of Aco2(K730) and Acadl (K81) in both the Lean and GDM offspring ($p<0.05$).

Conclusion: GDM exposure and postnatal HFS diet induced differential acetylation of peptides involved in important mitochondrial processes when compared to LF control diet. Differential acetylation of these proteins could contribute to mitochondrial dysfunction present in diabetic cardiomyopathy.

Wednesday, April 7, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Marcel van de Wouw
Department	Department of Pediatrics
Institution / Organization	University of Calgary
Address	3820 - 24 Avenue NW , Child Development Centre Calgary, Alberta, T3B 2X9 Canada
Phone Number	(+1) 403-3907918
E-mail Address	marcel.vandewouw@ucalgary.ca

Abstract Title	Associations Between Internalizing Behaviors and the Gut Microbiota in Preschool Children
Speaker	Marcel van de Wouw
Author	Marcel van de Wouw, Yanan Wang, Matthew L. Workentine, Elnaz Vaghef-Mehrabany, Deborah Dewey, Raylene A. Reimer, Lianne Tomfohr-Madsen, Gerald F. Giesbrecht

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background/Introduction: Emerging evidence points toward a connection between mental health and the gut microbiota and its metabolites such as short-chain fatty acids (SCFAs). It is unknown whether the gut microbiota is associated with the development of mental health problems (e.g., internalizing or externalizing behaviors) in preschool children. The objective of this study was to evaluate associations between the gut microbiota and internalizing and externalizing behaviors in preschool-aged children.

Methods: A community sample of 248 typically developing children, aged 3-4 years, provided a stool sample for 16S rRNA analysis of the microbiota and SCFAs. Parents reported child internalizing and externalizing behaviors using the Child Behavior Checklist. Associations between child behaviors and gut microbiota measures were analyzed using Spearman correlations with subanalyses conducted in children clinically “at risk” for behavior problems.

Results: There was a negative correlation between Shannon alpha diversity with internalizing behaviors, and its subscale somatic complaints, while children clinically “at risk” for internalizing problems had decreased alpha diversity. Furthermore, internalizing behaviors correlated with the metabolites valerate and isobutyrate, while the somatic complaints subscale additionally correlated with the SCFAs acetate and butyrate. These findings were also present in children “at risk” for internalizing problems and somatic complaints.

Conclusion/Discussion: These analyses reveal novel associations between internalizing behaviors in preschool children and the composition of the gut microbiota. Furthermore, a relationship between somatic complaints and fecal acetate and butyrate was identified, which suggests that interventions that target the gut microbiota to increase SCFA production warrant future investigation.

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	Barbara S.E. Verstraeten
Department	Obstetrics and Gynecology
Institution / Organization	University of Alberta
Address	220 Heritage Medical Research Centre Edmonton, Alberta, T6G2S2 Canada
Phone Number	(780) 903-5236
E-mail Address	verstrae@ualberta.ca

Abstract Title	Resilience, coping styles, and cognitive appraisal moderate disaster effects on maternal posttraumatic stress: the Fort McMurray Wood Buffalo wildfire study
Speaker	Barbara S.E. Verstraeten
Author	Barbara S.E. Verstraeten, Guillaume Elgbeili, Ashley Hyde, Suzanne King and David M. Olson

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: Women are more susceptible to posttraumatic stress disorder. Mitigating stress in pregnant women is important for their well-being and to protect their unborn children from the effects of prenatal stress. Disaster stress can be measured as objective hardship, subjective distress, and cognitive appraisal of the event. We postulate that resilience, coping styles, and cognitive appraisal moderate effects of objective hardship on posttraumatic stress symptoms (PTSS) in mothers 10 and 24 months after the 2016 Fort McMurray Wood Buffalo wildfire in Alberta, Canada.

Methods: 200 women, pregnant or within 6 months pre-conception during the fire, were recruited 10.3±4.0 months after the disaster, completing the Impact of Event Scale–Revised (IES-R) for PTS symptoms, Connor-Davidson Resilience Scale, and Brief COPE for coping strategies. At 24 months post-fire (24MPF), 109 women (54.5%) completed an objective stress scale and indicated their cognitive appraisal (very negative-very positive). The 24MPF IES-R was returned by 75 (37.5%).

Repeated measures, correlation, and moderation analyses of the objective stress-PTSS relationship were performed, with $p<0.05$ significant.

Results: PTSS did not significantly decrease by 24MPF ($p=0.26$). High levels of objective hardship, dysfunctional coping, and negative cognitive appraisal correlated with higher PTSS at recruitment and 24MPF ($p<0.001$). High levels of resilience protected against PTSS at low degrees of hardship at recruitment only ($p=0.01$). Negative cognitive appraisal was associated with more PTSS at increasing levels of hardship, while neutral/positive cognitive appraisal was protective at 24MPF ($p=0.001$).

Conclusion: The persistence of PTSS two years after a natural disaster is concerning. Attitudes and personality play an important role in the development of enduring post-disaster PTS symptoms. The ability to positively reframe a tragedy is protective towards the continuation of symptoms, even at high levels of objective hardship. Supporting resilience, reframing, and positive coping styles may be beneficial for maternal mental health and child development.

Wednesday, April 7, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Dr.
Full Name	YANAN WANG
Department	Department of Paediatircs
Institution / Organization	University of Calgary
Address	CDC, Owerko Centre, Room 355 2500 University Drive NW Calgary, AB Canada
Phone Number	
E-mail Address	yanan.wang@ucalgary.ca

Abstract Title	Association between microbial metabolites and sleep in preschool aged children
Speaker	Yanan Wang
Author	Yanan Wang, Marcel van de Wouw, Lauren Drogos, Raylene A. Reimer, Lianne Tomfohr-Madsen, Gerald F. Giesbrecht

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Sleep is essential for child growth and development. However, many children under five years of age suffer from sleep problem. Emerging evidence in animals and human adults point a relationship between sleep and the gut microbiota; however, it is unclear whether the sleep of preschoolers, a key developmental period, associates with features and metabolites of gut microbiota. This study aimed to assess the relationship between sleep and gut microbiota composition and metabolites in preschool aged children. Sleep measures included total sleep time (TST), sleep efficiency (SE), and wake-time after sleep onset (WASO) assessed using actigraphy. Sleep problems were assessed via parent reported Child Behavior Checklist Preschool (CBCL) 1 ½ -5-LDS. Participating children were classified into “low” and “high” sleep groups based on the median of each actigraphy measure. Relative abundance of Bifidobacterium was higher in the high TST group and Bacteroides was higher in children who had higher SE and low WASO (LDA score >2). Several faecal metabolites potentially involved in serotonin metabolism were associated with better sleep. In particular, levels of glycine, tryptophan and tyrosine were higher in high SE and low WASO groups (LDA score >2). Our results show that sleep is

associated with the gut microbiota and microbial metabolites in pre-school aged children. The crosstalk between gut microbiota and sleep is possibly regulated by microbial metabolites that are part of sleep related neurotransmitter metabolism.

Saturday, April 10, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Ms.
Full Name	Queenie Kwan Wing Li
Department	Psychology
Institution / Organization	University of Calgary
Address	26 Bermuda Way NW Calgary, AB, T3K 1G8 Canada
Phone Number	(403) 605-0990
E-mail Address	queenie.li@ucalgary.ca

Abstract Title	Associations between neighborhood factors, child sleep, and language development
Speaker	Queenie Li
Author	Queenie KW Li, Anna L MacKinnon, Susan Graham, Sheri Madigan, Suzanne Tough*, Lianne Tomfohr-Madsen*

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Language ability is strongly related to valued child developmental outcomes including emotional functioning, social wellbeing, and academic achievement. Family-level socioeconomic status (SES) predicts child language ability, with children from disadvantaged homes trailing their affluent peers in expressive and receptive language skills. It is unclear, however, whether neighborhood-level factors (i.e., SES and disorder) have a similar impact as individual factors. Further, the mechanisms through which SES operates on language development are not well understood. The current study investigated the association between neighborhood factors and child language outcomes, and sleep as a potential mediator in the relationship.

Methodology: Secondary analysis using Multilevel Modeling (MLM) was conducted with data from the longitudinal All our Families cohort study. A subsample of 2444 participants who provided postal codes in early pregnancy was included. Neighborhood SES was determined using the census-based Vancouver Area Neighborhood Deprivation Index (VANDIX). Neighborhood disorder was assessed using community crime reports from local police services. Mothers reported their children's sleep duration (at 4 and 12 months postpartum) and language ability (at 5 years).

Results: As hypothesized, MLM indicated that greater neighborhood deprivation and disorder during

pregnancy predicted worse child language outcomes at 5 years, even when controlling for individual family-level factors. Path analyses revealed an indirect effect of neighborhood disorder through child sleep at 12 months, suggesting that sleep partially explains the relationship between certain neighborhood factors and child language ability.

Conclusions: Our results demonstrate that neighborhood-level factors can have significant effects on developmental outcomes, which adds to growing evidence that child development should be considered within multiple systems of influence. In addition, sleep as a mechanistic link between socioeconomic factors and child language ability warrants further study.

Thursday, April 8, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

Prefix	Mr.
Full Name	Elliott Daniel Wong
Department	Department of Physiology and Pharmacology
Institution / Organization	Western University - Schulich School of Medicine & Dentistry
Address	1151 Richmond St. London, Ontario, N6A5C1 Canada
Phone Number	
E-mail Address	ewong365@uwo.ca

Abstract Title	Concentration responsive effects of remdesivir on mouse preimplantation development
Speaker	Elliott Wong
Author	Elliott Wong, Dr. Michele Calder, Ruxandra-Maria Bogdan, Dr. Dean H. Betts, Dr. Andrew J. Watson

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background/Introduction: As the coronavirus 2019 pandemic (COVID-19) persists, the safe management of pregnant women remains urgent due to their heightened risk for severe pneumonia, death and potential for antiviral therapies to harm the developing fetus. Preimplantation development is an environmentally sensitive period that forms a multi-cellular blastocyst under the tight spatiotemporal activation of cell fate signaling pathways and transcription factors, notably caudal-type homeobox 2 (CDX2) and octamer-binding transcription factor 4 (OCT4). Presently, remdesivir is the only approved agent for COVID-19 treatment. However, safety data on remdesivir and its potential to disrupt cell fate mechanisms during preimplantation development remains unknown. We hypothesized that increasing therapeutic doses of remdesivir to near toxicity levels will reduce mouse preimplantation development to the blastocyst stage and decrease expression of CDX2 and OCT4 cell fate markers.

Methodology: Two-cell CD-1 mouse embryos were cultured in vitro with KSOMaa in a remdesivir concentration series for 48-hours. Blastocyst development, total cell number, percentage and number of OCT4- and CDX2-positive cells in embryos were assessed.

Results: Remdesivir dose-dependently inhibited mouse preimplantation development. Total embryo cell numbers significantly declined under 1 μM remdesivir compared to 0.1 μM remdesivir and controls

($p<0.05$). At $\geq$10 μM, remdesivir significantly reduced blastocyst progression ($p<0.0001$) and total cell numbers ($p<0.001$) compared to other groups, with most 100 μM-treated embryos developmentally arrested at the 4-8 cell stages. Similarly, CDX2- and OCT4-positive cell numbers decreased under 1 μM- and 10 μM-remdesivir compared to controls ($p<0.001$). However, the corresponding percentage and expression patterns of either cell fate marker were unchanged by remdesivir.

Conclusion/Discussion: Thus, while CDX2 and OCT4 expression were not restricted by remdesivir, low therapeutic doses were embryotoxic and suppressed blastocyst development. With more adverse developmental outcomes expected at higher doses, remdesivir therapy should be carefully considered in early pregnant women and women seeking to conceive.

Wednesday, March 24, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Allyson Jodi Wood
Department	Physiology and Pharmacology
Institution / Organization	Western University
Address	Western University, 1151 Richmond Street London, ON, N6A5C1 Canada
Phone Number	(905) 431-8188
E-mail Address	awood228@uwo.ca

Abstract Title	Pyrroloquinoline Quinone (PQQ) Exposure Negatively Alters Skeletal Muscle Gene Expression in Addition to Oxidative Stress/Fetal Growth Restriction Effects.
Speaker	Allyson Wood (A. Wood)
Author	A. Wood, L. Zhao, T. Regnault

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Introduction: Placental insufficiency (PI) oxidative stress (OS) is a significant driving force underlying muscle mitochondrial dysfunction in fetal growth restriction (FGR). PQQ, a bioactive polyphenol, rescues postnatal OS and promotes mitochondrial activity, but its utility in modulating the negative FGR environment has not been investigated.
Methodology: Myoblasts (C2C12) were differentiated for 7 days. PQQ (1uM and 10uM) was administered either for 7 days, or the last 48 hours, or the last 5 hours of differentiation. 750uM H2O2 was administered for 24 hours on day 6 to induce OS. Cells were collected and qPCR performed. In an animal model, pregnant guinea pig dams were treated with PQQ in drinking water (1mg/L) from mid-gestation until 65d (term ~69d). Fetuses with brain-to-liver ratio >0.65 and body weight <80g were classified as FGR. Fetal gastrocnemius muscle was collected and qPCR performed. All data were analyzed by one-way ANOVA and Dunnett's multiple comparisons test.
Results: H2O2 treatment, and PQQ treatment alone, in vitro, both significantly ($p<0.05$) decreased Cox7a1, Myod1, Ndufb6, Pax7, and Tfam mRNA. Similarly, mRNA markers of mitochondrial function,

Atp5a1, Cox7a1, Cpt1b, CS, Ndufb6, Pgc1a, Ppard, Pparg, Sirt1, Sirt3, Tfam, and Ucp2, and muscle differentiation, Myh1, Myh4, Myod1, and Myog were significantly ($p<0.05$) decreased in FGR gastrocnemius and were not rescued by maternal PQQ. PQQ treatment alone significantly ($p<0.05$) decreased CS, Myh4, Myod1, Myog, Pax7, Pgc1a, Ppard, Pparg, Sirt1, and Sirt3 fetal gastrocnemius mRNA.
Conclusion: Our results demonstrate that PQQ does not attenuate OS-induced damage nor promote muscle mitochondrial function in both in vitro and in vivo models of OS/FGR. Of concern, maternal ingestion of PQQ alone appears to negatively alter key fetal muscle mitochondrial genes and augment the negative effects of OS/FGR. These changes have unknown life course consequences and warrant further investigation.

Saturday, April 3, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Elisabeth Bailin Xie
Department	Psychology
Institution / Organization	University of Calgary
Address	2500 University Drive NW Calgary, Alberta, T2N 1N4 Canada
Phone Number	(613) 316-1581
E-mail Address	elisabeth.xie@ucalgary.ca

Abstract Title	Relationship Quality Predicts Mental Health in the Pregnancy During the COVID-19 Pandemic Cohort: A Four-Wave Cross-lagged Panel Analysis
Speaker	Bailin Xie
Author	E. Bailin Xie, Charlie Rioux, Joshua W. Madsen, Catherine Lebel, Gerald F. Giesbrecht, Lianne Tomfohr-Madsen

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Objective: The current study explored longitudinal associations between relationship satisfaction, depression, and anxiety among pregnant individuals during the first wave of the COVID-19 pandemic.

Background: Mental health problems are high among pregnant women during the COVID-19 pandemic. Relationship quality is robustly linked to mental health problems, including during pregnancy. During the COVID-19 pandemic, couples are spending more time together in the context of ongoing chronic stress, highlighting the importance of investigating the association between relationship satisfaction and mental health problems.

Method: Pregnant mothers (n = 1842) from the Pregnancy During the Pandemic Study (https://www.pregnancyduringthepandemic.com/) were surveyed monthly (April-July 2020). Depression and anxiety symptoms, and relationship satisfaction were self-reported. Cross-lagged panel models

were conducted to examine bidirectional associations between relationship satisfaction and mental health symptoms over time.

Results: Relationship satisfaction was significantly correlated with depression and anxiety at all time points. Longitudinally, relationship satisfaction predicted later depression and anxiety symptoms, but depressive and anxiety symptoms did not predict later relationship satisfaction.

Conclusion: This study suggests that poor relationship satisfaction is linked to subsequent elevations in prenatal depressive and anxiety symptoms during the COVID-19 pandemic. Relationship enhancement interventions during pregnancy may be a means of improving the mental health of pregnant mothers during times of prolonged psychological distress.

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Xinyuan Li
Department	Integrated Program in Neuroscience
Institution / Organization	McGill University
Address	6875 LaSalle Boulevard Montreal, Quebec, H4H 1R3 Canada
Phone Number	(514) 662-9789
E-mail Address	xinyuan.li2@mail.mcgill.ca

Abstract Title	Disaster-related prenatal maternal stress predicts abnormalities in gray matter volume and resting-state functional connectivity in late adolescence
Speaker	Xinyuan Li
Author	Xinyuan Li, Muhammad Naveed Iqbal Qureshi, Guillaume Elgbeili, Sherri Lee Jones, Firoza Lussier, Jaime Fernandez Arias, Pedro Rosa-Neto and Suzanne King

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background: Neuroimaging studies suggest that prenatal maternal depression is associated with abnormalities in offspring brain structure or function. However, it is unknown whether disaster-related prenatal maternal stress (PNMS) predicts such abnormalities. Additionally, it remains unclear whether timing of exposure to the stressor or offspring sex moderates the effects of PNMS. Moreover, given most studies focus on infancy and childhood, it is unclear whether the effects of PNMS persist into adolescence and adulthood.
Methodology: We enrolled 31 adolescents (age 18½ years) whose mothers were pregnant during January 1998 Quebec Ice Storm and matched 54 controls. The mothers' disaster-related PNMS (i.e., objective hardship, subjective distress, and cognitive appraisal) was assessed in June 1998. Voxel-based morphometry analysis was applied to examine differences in gray matter volume (GMV) between the Ice Storm group and controls. Then we used clusters showing GMV changes as seeds to examine

functional connectivity (fc) abnormalities induced by GMV changes. Regression models were implemented to evaluate PNMS-brain (GMV and fc alterations) associations.
Results: Relative to controls, Ice Storm group exhibited increased GMV in the right entorhinal gyrus, right parahippocampus, left thalamus, posterior cingulate gyrus (PCG)/precuneus, right hippocampus, left lateral occipital gyrus (LOG), anterior cingulate gyrus (ACG), and bilateral postcentral gyri. In the Ice Storm group, greater objective hardship was associated with increased GMV in the left thalamus when mothers were exposed during preconception and early pregnancy. Negative cognitive appraisal predicted increased LOG GMV in boys but not in girls. Ice Storm group had lower PCC/precuneus fc with bilateral frontal pole and higher ACG fc with the middle temporal gyrus compared to controls.
Conclusion: Disaster-related PNMS predicted atypical brain structure and fc in adolescents, dependent on timing of exposure or offspring sex. Our study demonstrated long-lasting effects of prenatal programming and extended prior work from infancy and childhood to late adolescence.

Thursday, March 25, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Ms.
Full Name	Xinyuan Li
Department	Integrated Program in Neuroscience
Institution / Organization	McGill University
Address	6875 LaSalle Boulevard Montreal, Quebec, H4H 1R3 China
Phone Number	(514) 662-9789
E-mail Address	xinyuan.li2@mail.mcgill.ca

Abstract Title	Effectiveness of cognitive behavioral therapy for perinatal maternal depression, anxiety and stress: A systematic review and meta-analysis
Speaker	Xinyuan Li
Author	Xinyuan Li, David P Laplante, Vincent Paquin, Sandra Lafortune, Guillaume Elgbeili,Suzanne King

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Abstract
Background: Cognitive behavioral therapy (CBT) has been widely studied in either prenatal or postnatal women. The majority of these studies focused on depression with much less research on efficacy of CBT for anxiety and stress. Additionally, no meta-analysis has comprehensively examined both short- and long- term efficacy of CBT for perinatal depression, anxiety and stress.
Methodology: PubMed, Embase, CINAHL, PsychINFO, and Cochrane Library databases were systematically searched. We included 66 randomized controlled trials (RCTs) assessing the efficacy of CBT (including CBT alone and CBT+co-interventions) during pregnancy and the first year postpartum. The primary outcome was mean change scores in depressive, anxiety and stress symptoms from baseline to immediately post-intervention, and to the end of follow-up.
Results: The meta-analysis included 56 RCTs (10 RCTs without available outcome data). Both CBT alone and CBT+co-interventions were effective in reducing perinatal maternal depression scores in the

short term (SMD= -0.60, 95% CI: -0.72 to -0.47, I2=70%) and long term (SMD= -0.52, 95% CI -0.69 to -0.36, I2=83%). CBT alone was effective for low-income women with perinatal depression. CBT alone had both short- and long- term efficacy for perinatal anxiety (short term: SMD = -0.49, 95% CI −0.68 to −0.29, I2=70%; long term: SMD= -0.55, 95% CI −0.90 to −0.21, I2=75%), despite the efficacy varying with moderators (e.g., formats, timing, duration of CBT). Additionally, CBT alone was effective for women with perinatal stress in the short term (SMD= -0.74, 95% CI −1.18 to −0.29, I2=74%) and for women with perinatal posttraumatic stress disorder (PTSD) in the long term (MD= -13.79, 95% CI −25.27 to -2.30, I2=42%).
Conclusion: Despite variability in efficacy according to specific moderators, CBT exhibited short-term efficacy for perinatal depression, anxiety and stress, and long-term efficacy for perinatal depression, anxiety and PTSD. CBT was particularly effective for perinatal depression in low-come women.

Friday, March 26, 2021

Abstract Submission Form

DOHaD 21st Century: New insights, new challenges

The opportunity exists for trainees to present their work during the DOHAD Canada Webinar 2021 as an oral or poster presentation and prizes will be given for the best presentation. Please submit your abstracts to DOHAD Canada by Saturday, APRIL 10, 2021 via this form.

Prefix	Mr.
Full Name	Peter Zimmermann
Department	Gynecology
Institution / Organization	Technische Universität München
Address	Schanzenbachstraße 13 Munich, Bavaria, 81371 Germany
Phone Number	
E-mail Address	peterzimmermann-ks@web.de

Abstract Title	SEX SPECIFIC EFFECTS OF THE IMPACT OF PRENATAL STRESS ON NEONATAL IRON HOMEOSTASIS
Speaker	Peter Zimmermann
Author	Peter Zimmermann, Martin G. Frasch, Ritika Sharma, Camilla Zelgert, Natasha Wenzel, Marta C. Antonelli, Silvia M. Lobmaier

Abstracts (maximum of 300 words): Abstracts should be broken down in clearly identifiable components of Background/Introduction, Methodology, Results, and Conclusion/Discussion.

Background/Introduction: Matching the rising need for iron during pregnancy is important to prevent an impairment of the growing child's neurodevelopment due to iron deficiency. Our objective was to assess the influence of prenatal maternal stress (PS) on the neonatal iron homeostasis.

Methodology: In a prospective case-control study (FELICITy) between June 2016 and July 2019, we screened 2000 women during third trimester of pregnancy at the Department of Obstetrics and Gynecology at "Klinikum rechts der Isar" of the Technical University of Munich using Cohen Perceived Stress Scale-10 (PSS-10) questionnaire. Patients with PSS-10 $\geq$ 19 were classified as a stressed group (SG). Women with PSS-10 < 19 served as the control group (CG) matched with SG patients for gestational and maternal age at study entry and for parity. Neonatal cord blood serum hepcidin, transferrin, and iron were determined. To obtain an unbiased estimate of the total effect of PS exposure on iron homeostasis we conducted causal directed acyclic graph (DAG) analysis to adjust

for confounding covariates.

Results: SG and CG included 79 [49 males and 30 females] and 85 [44 males and 41 females] fetuses, respectively. Transferrin saturation (p = 0.044) and iron (p = 0.008) were lower in male stressed neonates. The minimum adjustment set of the DAG to estimate the total effect of PS exposure on iron biomarkers is maternal age and socioeconomic status: SG revealed a 38.06 μg/dL (95% CI -79.91 to 3.78 μg/dL; p = 0.0746) or 15,4% decrease in neonatal ferritin compared with CG.

Conclusions/Discussion: PS during the third trimester perturbs neonatal iron markers in a sex-dependent manner. Early detection of PS can support early individualized pre- and postnatal iron supplementation and neurodevelopmental follow-up to prevent long-term sequelae.