



## SEVENTH ANNUAL RESEARCH CONFERENCE

*Innovation from cell to society<sup>7</sup>*

**Preliminary  
Programme**

**February 5 - 7, 2012  
Fairmont Royal York, Toronto, Ontario**

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### Conference Learning Objectives:

- Familiarize delegates with the most current science and practical knowledge relevant to the etiology of childhood asthma and allergy and to learn about unique data that will help determine environmental effects on childhood allergy and asthma
- To provide delegates with opportunities to share their experiences and discuss challenges with renowned Canadian and international experts in allergy, asthma, anaphylaxis and related immune disease research through interactive and dynamic educational sessions.
- To give delegates an opportunity to interact with their colleagues on the latest clinical trends in the fields of allergy, asthma and anaphylaxis
- To offer delegates pragmatic take-home messages with a view toward enhancing their clinical practice
- To allow graduate, post-doctoral, and medical students opportunities to share and discuss their research findings with experts to enhance knowledge and networking opportunities

***This event is an Accredited Group Learning Activity (Section1) as defined by the Maintenance of Certification program of the Royal College of Physicians and Surgeons of Canada, and approved by the Canadian Society of Allergy and Clinical Immunology.***

## SUNDAY FEBRUARY 5, 2012

7:00 – 8:30 AM BREAKFAST BUFFET ONTARIO ROOM

8:15 – 8:30 AM WELCOME REMARKS CANADIAN ROOM

**Dr. Diana Royce, EdD**, Managing Director and COO, AllerGen NCE Inc.

**Dr. Sharon Dell, BEng, MD, FRCPC**, Associate Professor, Department of Pediatrics & iHPME, University of Toronto

**Senior Associate Scientist, Division of Respiratory Medicine, The Hospital for Sick Children**  
**Dr. Teresa To, PhD**, Senior Scientist, Child Health Evaluative Sciences, The Hospital for Sick Children, Toronto

8:30 – 9:30 AM ALLERGEN TRAINEE POSTER “LIGHTNING” PRESENTATIONS CANADIAN ROOM

9:30 – 11:00 AM OPENING CEREMONIES CANADIAN ROOM

### WELCOME AND INTRODUCTIONS

**Mr. Graham W.S. Scott, C.M., Q.C.**, Chair, Board of Directors, AllerGen NCE Inc. and CEO, Graham Scott Strategies Inc.

**Dr. Alain Beaudet**, President, Canadian institutes of Health Research (CIHR)

**Mr. Jean-Claude Gavrel**, Executive Vice-President, Networks of Centres of Excellence

**Dr. Shoo Lee, MBBS, FRCPC, FAAP, PhD**, Scientific Director, (CIHR) Institute of Human Development, Child and youth Health

**Dr. Marc Ouellette, PhD**, Scientific Director, (CIHR) Institute of Infection and Immunity

**Dr. Janet Rossant, PhD, FRS, FRSC**, Chief of Research, Research Institute, Hospital for Sick Children, Senior Scientists, Development and Stem Cell Biology and Professor, University of Toronto

**Dr. Judah Denburg, MD, FRCP(C)**, Scientific Director and CEO, AllerGen NCE Inc.; Professor of Medicine, Department of Medicine, McMaster University

11:00 – 11:45 AM OPENING KEYNOTE: LONGITUDINAL STUDY OF PARENTS AND CHILDREN (ALSPAC) COHORT - KEY FINDINGS AND LESSONS LEARNED FROM A NETWORKED, BIRTH COHORT APPROACH TO RESEARCH ON CHILDHOOD ASTHMA AND ALLERGY CANADIAN ROOM

**Dr. John Henderson, MD, ChB (Manc), FRCP**, Professor of Paediatric, Respiratory Medicine, University of Bristol

**Moderator: Dr. Judah Denburg, MD, FRCP(C)**, Scientific Director and CEO, AllerGen NCE Inc.; Professor of Medicine, Department of Medicine, McMaster University

11:45 – 12:30 PM	<b>THE CHILD STUDY - UNCOVERING THE ORIGINS OF ASTHMA AND ALLERGIC DISEASE</b>	CANADIAN ROOM
<p><b>Moderator: Dr. Judah Denburg, MD, FRCP(C)</b>, Scientific Director and CEO, AllerGen NCE Inc. and Professor of Medicine, McMaster University</p>		
<p><b>Panel Participants:</b></p> <hr/>		
<p><b>Dr. Malcolm Sears, MB, ChB, FRACP, FRCPC, FAAAAI</b>, Director, Canadian Healthy Infant Longitudinal Development (CHILD) Study, AstraZeneca Chair in Respiratory Epidemiology, Professor, Division of Respiriology, Department of Medicine, McMaster University</p>		
<p><b>Dr. Jeff Brook, PhD</b>, Assistant Professor, Occupational and Environmental Health, University of Toronto; Senior Scientist, Air Quality Research Branch, Environment Canada</p>		
<p><b>Dr. Andrew Sandford, PhD</b>, Associate Professor, Department of Medicine, University of British Columbia, The James Hogg iCAPTURE Centre for Cardiovascular and Pulmonary Research, Institute for Heart + Lung Health</p>		
<p><b>Q &amp; A – 15 minutes</b></p>		
12:30 – 1:30 PM	BUFFET LUNCH	ONTARIO ROOM
1:30 – 3:30 PM	<b>ALLERGEN TRAINEE POSTER “LIGHTNING” PRESENTATIONS</b>	CANADIAN ROOM
<p><b>Moderator: Dr. Teresa To, PhD</b>, Senior Scientist, Child Health Evaluative Sciences, The Hospital for Sick Children, Toronto</p>		
3:30 – 5:15 PM	<b>POSTER VIEWING, JUDGING AND NETWORKING: WINE AND CHEESE</b>	CANADIAN ROOM
5:15 – 6:00 PM	FREE TIME	
6:00 – 7:30 PM	JUDGES MEET TO ADJUDICATE POSTER COMPETITION	ALGONQUIN ROOM
6:00 – 7:30 PM	<b>ALLERGEN TRAINEES (HQP) AND ASNPN DINNER MEETING</b> <i>Invitation Only – Mandatory for all HQP’s and ASNPN members</i>	ROOM TBC
7:30 – 10:00 PM	<b>ALLERGEN TRAINEES (HQP) AND ASNPN NETWORKING NIGHT</b> <i>All Delegates are Invited to Attend</i>	ROOM TBC

## MONDAY FEBRUARY 6, 2012

7:00 – 8:20 AM BREAKFAST BUFFET ONTARIO ROOM

8:20 – 8:30 AM DAY TWO WELCOME CANADIAN ROOM

**Dr. Sharon Dell, BEng, MD, FRCPC**, Associate Professor, Department of Pediatrics & iHPME, University of Toronto

8:30 – 10:00 AM ALLERGEN KEYNOTE PRESENTATION CANADIAN ROOM

**“The Canadian Healthy Infant Longitudinal Development (CHILD) Study: Directions, Drivers and Destination”**

**Dr. Malcolm Sears, MB, ChB, FRACP, FRCPC, FAAAAI**, Director, Canadian Healthy Infant Longitudinal Development (CHILD) Study, AstraZeneca Chair in Respiratory Epidemiology, Professor, Division of Respiriology, Department of Medicine, McMaster University

**Panelists:**

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**“Viral Infections and Lung Function in CHILD”**

**Dr. PJ Subbarao, MD, FRCP(C)**, Deputy Director CHILD Study, Assistant Professor, Department of Paediatrics, University of Toronto

**“Dietary Assessments in CHILD”**

**Dr. Piush Mandhane, MD**, Department of Pediatrics, University of Alberta and Edmonton CHILD Study Site Leader

**“Value-Added Partnerships: Health Canada and CHILD”**

**Dr. Amanda Wheeler, PhD**, Research Scientist, Exposure Assessment Section, Health Canada

**“Value-Added Partnerships: Environment Canada and CHILD”**

**Dr. Jeff Brook, PhD**, Assistant Professor, Occupational and Environmental Health, University of Toronto; Senior Scientist, Air Quality Research Branch, Environment Canada

10:00 – 10:30 AM BREAK CANADIAN ROOM

10:30 – 12:00 PM CLINICAL TRIALS CANADIAN ROOM

**Moderator: Dr. Paul O’Byrne, MD**, Chair of Medicine and Professor, Division of Respiriology, Department of Medicine, McMaster University

**PRESENTERS:**

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**“Clinical Models of Asthma for Drug Discovery”**

**Dr. Gail Gauvreau, PhD**, Associate Professor, Division of Respiriology, Department of Medicine, McMaster University

**“The Development of Peptide Vaccines for Allergies”**

**Dr. Mark Larché, PhD**, Professor, Division of Clinical Immunology & Allergy, McMaster University and Canada Research Chair, Allergy & Immune Tolerance

**“Research Collaborations Involving Allergen Challenges and Exposures”**

**Dr. Scott Tebbutt, PhD**, Chief Scientific Officer for the Prevention of Organ Failure (PROOF) Centre of Excellence and Assistant Professor, Department of Medicine, Division of Respiratory Medicine, University of British Columbia

**“Expansion of AllerGen CIC to Severe Asthma”**

**Dr. Parameswaran Nair, MD, PhD, FRCP, FRCPC**, Associate Professor, Division of Respiratory Medicine, Department of Medicine, McMaster University and Canada Research Chair in Airway Inflammometry

<b>12:00 – 1:00 PM</b>	<b>BUFFET LUNCH</b>	<b>ONTARIO ROOM</b>
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<b>1:00 – 1:30 PM</b>	<b>AIR AWARE PRESENTATION – CLEAN AIR CHAMPIONS ON YOUR MARKS - GET SET - GET AIR AWARE!</b>	<b>CANADIAN ROOM</b>
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<b>1:30 – 3:30 PM</b>	<b>TRAINEE POSTER AWARD COMPETITION: ORAL PRESENTATION FINALISTS</b>	<b>CANADIAN ROOM</b>
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**Moderator: Dr. Teresa To, PhD**, Senior Scientist, Child Health Evaluative Sciences, The Hospital for Sick Children, Toronto

<b>1:30 – 2:00 PM</b>	<b>GENE-ENVIRONMENT INTERACTIONS</b>
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<b>2:00 – 2:30 PM</b>	<b>DIAGNOSTICS &amp; THERAPEUTICS</b>
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<b>2:30 – 3:00 PM</b>	<b>PUBLIC HEALTH, ETHICS, POLICY &amp; SOCIETY</b>
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<b>3:00 – 3:30 PM</b>	<b>BREAK</b>	<b>CANADIAN ROOM</b>
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<b>3:30 – 4:30 PM</b>	<b>FROM THE BUMS OF BABES: CLUES TO CHILDHOOD ASTHMA AND ALLERGIES</b>	<b>CANADIAN ROOM</b>
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**Moderator: Dr. Catherine Field, PhD**, Professor, Department of Agricultural, Food & Nutritional Science, University of Alberta

**Presenters:**

**“Introduction to SyMBIOTA and Microbiome Research in Canada”**

**Dr. Anita Kozyrskyj, PhD**, Research Chair and Associate Professor, Maternal-Child Health and the Environment, Women and Children's Health Research Institute, Department of Pediatrics, Faculty of Medicine & Dentistry, University of Alberta

**Dr. James Scott, PhD**, Associate Professor, Occupational and Environmental Health, Dalla Lana School of Public Health, University of Toronto and CEO and Scientific Director of Sporometrics Inc.

**“Microbiome Research Methods: DNA Sequencing and Taxonomy”**

**Heather Maughan, PhD**, University of Toronto

**“Preliminary Results from SyMBIOTA: Impact of the Home Environment on Infant Intestinal Microbiota”**

**Tedd Konya, MAT**, Dalla Lana School of Public Health, University of Toronto

**“Preliminary Results from SyMBIOTA: Impact of Infant Diet on Intestinal Immunity and Microbiota”**

**Meghan Azad, PhD**, University of Alberta

**“Immunomodulation by Commensal and Probiotic Bacteria: Animal Models”**

**Dr. Paul Forsythe, PhD**, Assistant Professor, Division of Respiriology, Department of Medicine, McMaster University

**4:30 – 7:00 PM**

**FREE TIME**

**7:00 – 7:30 PM**

**CONFERENCE RECEPTION**

**IMPERIAL ROOM**

**7:30 – 11:00 PM**

**CONFERENCE BANQUET AND AWARDS CEREMONY**

**IMPERIAL ROOM**

**TUESDAY FEBRUARY 7, 2012**

**7:00 – 8:20 AM**

**BREAKFAST BUFFET**

**ONTARIO ROOM**

**8:20 – 8:30 AM**

**DAY THREE WELCOME**

**CANADIAN ROOM**

**Dr. Diana Royce, EdD**, Managing Director and COO, AllerGen NCE Inc.

**8:30 – 9:30 AM**

**THE CHILD STUDY: ISSUES, INITIATIVES AND IMPACT**

**CANADIAN ROOM**

**Moderator: Dr. Malcolm Sears, MB, ChB, FRACP, FRCPC, FAAAAI**, Director, Canadian Healthy Infant Longitudinal Development (CHILD) Study, AstraZeneca Chair in Respiratory Epidemiology, Professor, Division of Respiriology, Department of Medicine, McMaster University

**“Ethical Challenges and Cohort Studies: What Have We Learned?”**

**Dr. Tim Caulfield, LL.M. F.R.S.C.**, Professor, Faculty of Law and School of Public Health; Research Director, Canada Research Chair in Health Law and Policy; Senior Health Scholar with the Alberta Heritage Foundation for Medical Research and Research Director, Health Law Institute, University of Alberta

**“Using CHILD for Exploration of Common Pathways of Multiple Exposure Effects”**

**Dr. Tim Takaro, MD**, Associate Professor, Faculty of Health Sciences, Simon Fraser University

**“CHILD Study Immunology”**

**Dr. Stuart Turvey, MBBS, DPhil, FRCPC**, Associate Professor, Division of Infectious and Immunological Diseases, Department of Pediatrics, University of British Columbia and British Columbia Site Leader for the CHILD Study

**9:30 – 10:15 AM**

**GENE-ENVIRONMENT INTERACTIONS**

**CANADIAN ROOM**

**Moderator: Dr. Andrew Sandford, PhD**, Associate Professor, Department of Medicine, University of British Columbia, The James Hogg iCAPTURE Centre for Cardiovascular and Pulmonary Research, Institute for Heart + Lung Health

**Presenters:**

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**Dr. Denise Daley, PhD**, Assistant Professor, Respiratory, Department of Medicine, University of British Columbia and Canada Research Chair in Genetic Epidemiology of Complex Diseases

**Dr. Fiona Brinkman, PhD**, Associate Professor, Bioinformatics and Genomics, Department of Molecular Biology and Biochemistry, Simon Fraser University, British Columbia

**10:15 – 10:45 AM BREAK**

**CANADIAN ROOM**

**10:45 – 11:45 AM IMMUNE MARKERS AND THERAPEUTICS**

**CANADIAN ROOM**

**“Can We Identify IL-13 Responsive Asthmatics?”**

**Dr. Del Dorscheid, MD, PhD**, Associate Professor of Medicine, University of British Columbia and researcher at The James Hogg Research Centre and Institute for Heart + Lung Health, British Columbia

**“Tolerogenic Dendritic Cell Therapy for Allergic Disease”**

**Dr. John Gordon, PhD**, Director, Canadian Centre for Health and Safety in Agriculture (CCHSA) and Professor, Division of Respiratory, Critical Care & Sleep Medicine, Department of Medicine, University of Saskatchewan

**“Pre-CHILD Cohort Results on Innate Immune Ontogeny”**

**Dr. Tobias Kollmann, MD, PhD**, Clinician Scientist, Child & Family Research Institute, Assistant Professor, Division of Infectious and Immunological Diseases, Department of Pediatrics, University of British Columbia and Pediatric Infectious Disease Consultant, BC Children's Hospital

**Moderator: TBC**

**11:45 – 12:30 PM ASTHMA EDUCATION**

**CANADIAN ROOM**

**“Engaging Aboriginal Families Affected by Allergies and Asthma in Support-Education Program Development”**

**Dr. Heather Castleden, PhD**, Assistant Professor, Faculty of Management, School of Resource and Environment Studies, Dalhousie University

**“All I Really Need to Know (about Asthma), I Learned in Kindergarten: Lessons from the Roaring Adventures of Puff’s 17 Years”**

**Shawna McGhan, RN, BN, CAE, MN**, Director, Health Innovation, Alberta Asthma Centre and Research Associate and Associate Faculty Member, Faculty of Nursing, University of Alberta

**Moderator: Cheryl Connors**, Executive Director, Canadian Network for Respiratory Care

**12:30 – 1:30 PM BUFFET LUNCH**

**ONTARIO ROOM**



1:30 – 3:00 PM

**RESEARCH BENEFITING PATIENTS  
FUTURE RESEARCH PRIORITIES AND OPPORTUNITIES**

CANADIAN ROOM

**Moderator: Dr. Susan Elliott, PhD**, Professor and Dean, Faculty of Applied Health Sciences, University of Waterloo

**Presenters:**

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**“They say ‘Stay Away From Me, I Have Touched Peanuts’: Exploring Social Exclusion Among Youth with Anaphylaxis”**

**Dr. Nancy Fenton, PhD**, Assistant Professor, School of Public Health and Health Systems, University of Waterloo

**Sara Shannon**, Anaphylaxis Safety and Awareness Advocate and Sabrina Shannon’s mother

**“Parental Preferences for Asthma Control in Children”**

**Dr. Wendy Ungar, PhD**, Associate Professor, Health Policy, Management and Evaluation, University of Toronto and Senior Scientist, Child Health Evaluative Sciences, the Hospital for Sick Children, Toronto

**Additional Discussants for Interactive Panel:**

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**Dr. Susan Wasserman, MD, FRCPC**, Professor, Clinical Immunology and Allergy, Department of Medicine, McMaster University, Clinician, Hamilton Health Sciences Corporation and Director, Adverse Reactions Clinic, Firestone Institute of Respiratory Health

**Dr. Larry Lynd, PhD**, Associate Professor, Faculty of Pharmaceutical Sciences, University of British Columbia, Scientist, Centre for Health Outcomes Research and Evaluation

**Discussants to be confirmed:**

Asthma Society of Canada

**Laurie Harada**, Anaphylaxis Canada

**Bill Swan**, National Asthma Patient Alliance (NAPA)

**Andrea Stevens-Lavigne**, Ontario Lung Association

3:00 – 3:15 PM

**BREAK**

CANADIAN ROOM

3:15 – 4:15 PM

**CLOSING KEYNOTE SPEAKER: INNOVATION IN CANADA: OPPORTUNITIES AND CHALLENGES 2012 AND BEYOND**

CANADIAN ROOM

**Roger L. Martin, MBA**, Chairman, Institute for Competitiveness & Prosperity and Dean, Joseph L. Rotman School of Management, University of Toronto

**Moderator: Dr. Diana Royce, EdD**, Managing Director and COO, AllerGen NCE Inc.

4:15 – 4:30 PM

**CLOSING REMARKS AND CONFERENCE ADJOURNMENT**

CANADIAN ROOM



## Preliminary Programme Abstracts

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### ***The Avon Longitudinal Study of Parents and Children (ALSPAC) Cohort – Key findings and lessons learned from a networked, birth cohort approach to research on childhood asthma and allergy.***

#### **John Henderson – Opening Keynote**

ALSPAC started life as the Avon Longitudinal Study of Pregnancy and Childhood, one of a number of longitudinal studies recruited in pregnancy and with planned follow up to seven years that arose from a WHO initiative in 1990. The goal was to investigate the genetic and environmental influences in early life that contributed to health, development and common diseases in children. However, despite shared goals, the lack of a common infrastructure led to the dissolution of many of the European partners in ELSPAC. In contrast, ALSPAC has grown to one of the premier resources of its kind consisting of a two-generation, richly-phenotyped population backed by a DNA bank, making it ideally positioned to take advantage of advances in high-throughput genetic technology. This presentation will consider the evolution of the ALSPAC Study from a resource for observational epidemiology in asthma and allergy to a constituent of many, large-scale collaborations to investigate the genetic basis of these complex diseases. This will be followed by a consideration of the perils and pitfalls that littered this journey and how the study team attempted to solve these.

Early studies relied on the size ( $n > 14,000$ ) and scope of ALSPAC to investigate associations between early life exposures and asthma or allergy in childhood while simultaneously considering the confounding influences of a wide variety of social and lifestyle factors. This latter feature often led to ALSPAC results refuting the findings of smaller studies in areas such as the reported links between maternal and early childhood nutrition, including breastfeeding, pertussis vaccination and infant RSV infection with asthma and allergic outcomes. Two key observational findings act as good exemplars of the evolution of ALSPAC to exploitation of its genetic resource: the associations between paracetamol and asthma and between peanut exposure and sensitisation. We were the first to report a link between frequent paracetamol use in pregnancy with asthma in the offspring<sup>1</sup>. We followed this with consideration of objective outcomes, such as IgE levels<sup>2</sup>, and used novel approaches to confounding, such as paternal paracetamol intake as a control for shared lifestyle and behavioural with the mother<sup>3</sup>. On the hypothesised basis of paracetamol's mode of action, depletion of the antioxidant glutathione, we studied interactions between paracetamol and polymorphisms of genes regulating defences against oxidant injury, including *Nrf2* and Glutathione-s-transferases (*GSTs*)<sup>4</sup>, finding a modification of the paracetamol with asthma relationship by the minor allele of the former. ALSPAC initially reported an association between peanut sensitisation and the application of peanut-oil containing creams in infancy<sup>5</sup>. Following discovery of polymorphisms in the filaggrin gene, to which ALSPAC contributed population-based evidence on the associations with eczema<sup>6</sup>, we collaborated on a study that showed loss-of-function mutations in the filaggrin gene were associated with peanut sensitisation, adding further evidence to the role of epithelial barrier function in the pathogenesis of allergic sensitisation<sup>7</sup>. Each of these examples shows how epidemiological observations within the cohort were enhanced and extended by collaboration with external multi-disciplinary groups.

As genotyping technology has advanced to genomewide screens that can be processed on industrial scales, the focus on seeking genetic causes of complex diseases has shifted from candidate genes to agnostic genomewide association studies (GWAS). Stringent false discovery penalties coupled with difficulties in classifying precisely a common phenotype have pushed the demand for very large, collaborative studies to have sufficient statistical power to detect associations. The first ALSPAC grant to look at the genetics of asthma in 2000 using a candidate gene approach was overtaken by technological advances such that no data from that study were ever published. Since then, ALSPAC has contributed to several large collaborations using GWAS to study a range of different phenotypic outcomes in several unrelated fields. Collaborations started out as disease specific projects to genotype large populations, e.g. the European-based GABRIEL study on the genetic associations of asthma<sup>8</sup> and, as cohorts have assimilated genomewide data, new collaborations have emerged and boundaries between project-specific groupings have become less well-defined. The Early Genetics and Lifecourse Epidemiology (EAGLE) Consortium now covers 14 independent cohorts with GWAS data available and has 10 component working groups spanning a range of phenotypes and outcomes. The first GWAS study on eczema on behalf of EAGLE has recently been published and identified three new risk loci<sup>9</sup>.

### ***What have we learned?***

Key learning points from the ALSPAC study's journey from a stand-alone, large, birth cohort study to a major player in international genetic consortia will be discussed. These include:

- Mind the gap: there is an inevitable lag between the initiation of a cohort study and it being fully productive. There is a need to be mindful of this in negotiations with funders. Longitudinal cohorts are resource-hungry and windows of opportunity for measurements close rapidly. It is important to be adequately resourced during this relatively fallow period of output.
- For large, multifaceted data collection exercises, engage data storage and management experts at an early stage. Linkage problems are difficult to disentangle in retrospect. It is also necessary to have adequate participant protection while making sure the data can be appropriately exploited by researchers.
- Cohorts are exceedingly valuable data resources: decide early on a strategy for data guardianship and sharing. There is a balance to be struck between free dissemination of data and incentives for core researchers to win grants and produce the data. Funders want data to be used widely, researchers often have different agenda.
- Once you have a collaboration policy, write it down & have it available in the public domain. This should include a clear description of the collaboration strategy and how to access the data.
- Collaborative projects should clearly define a writing and analysis group, including rules and order of authorship, at an early stage (and stick to them). A written constitution is helpful and several examples exist. If several outputs from collaborations are likely, it is worth rotating senior authorships and ensuring junior researchers at career-building stage are duly prominent. The gold-standard research currency is still first and last authorship.
- Keep an eye on the horizon and be prepared to change with the times. New technologies emerge rapidly and can have huge potential when applied to existing cohorts with the requisite biological samples. Subsequent replications can quickly become yesterday's news.
- As cohorts mature, their usefulness to different research constituencies may change. These may have different cultural norms (such as open access to data for social scientists) and should be anticipated in advance.

## ***The CHILD Study: Directions, Drivers and Destination***

**Malcolm Sears – AllerGen Keynote Presentation**

**PJ Subbarao - Viral infections and lung function in CHILD**

**Piush Mandhane - Dietary assessments in CHILD**

**Amanda Wheeler - Value-added partnerships: Health Canada and CHILD**

**Jeff Brook - Value-added partnerships: Environment Canada and CHILD**

The CHILD Study, for which planning began in 2005 with funding in 2007 through AllerGen and CIHR, began recruiting in 2008 and currently has over 3000 families participating in multiple centres across Canada. The presentation will highlight the concepts underlying the development of the study, the primary and secondary questions and hypotheses, and the integration of a wide range of disciplines into a cohesive study. CHILD is now well established not only as a longitudinal Canadian-based birth cohort study to explore the origins of allergy and asthma, but also as a legacy project and platform for other studies requiring longitudinal population data now and in the future.

### **Clinical Trials**

**Gail Gauvreau, Mark Larché, Scott Tebutt and Parameswaran Nair**

AllerGen's Clinical Investigator Collaborative (CIC) has successfully established partnerships with pharmaceutical and biotechnology companies, to evaluate investigational therapies for treatment of asthma. This collaborative is unique in its ability to utilize clinical models of asthma to evaluate the efficacy of therapies, by sharing well validated methods with proprietary SOPs. The AllerGen CIC also provides the opportunity to its Canadian investigators use new molecules, most of which have a very specific mechanism of action, to understand the critical pathways in asthma. Deeply rooted in scientific discovery, the CIC facilitates the addition of mechanistic experiments to their clinical trials. Furthermore, the achievements of the CIC support the creation of additional collaborations. The allergic rhinitis CIC (AR-CIC) evaluates investigational therapies for treatment of allergic rhinitis. A severe asthma CIC (SA-CIC) would provide the logical next step for drug development following proof of concept studies in asthma, conducted by CIC. Together, these CICs could be instrumental for rapid and thorough testing of new therapies developed for allergies and asthma.

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### **On your marks - get set - get Air Aware!**

Ingrid Liepa is a two-time Olympian in speedskating and former lawyer who has been addressing air quality, climate change and environmental sustainability issues for the last 16 years. Her main arenas are public policy, multi-stakeholder collaboration, education and community-based projects. Ingrid has been a Clean Air Champion since 2007.

Asthma is the most common chronic diseases among Olympians, reaching rates as high as 50 to 60% in some sports at elite levels. Athletes have been identified as an "at-risk" group in relation to air pollution, asthma and allergy. Despite their prevalence, these conditions are often not well understood within the sports world. Clean Air Champions' Air Aware program is changing that. Join two-time Olympian Ingrid Liepa in an engaging, interactive presentation that highlights the challenges and opportunities of raising awareness among coaches, athletes, youth, parents and administrators on the important connections between asthma, allergy, air pollution and active lifestyles.

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### ***From the Bums of Babies: Clues to Childhood Asthma and Allergies***

The human body plays host to trillions of microbes constituting the "Human Microbiome." Outnumbering host cells by at least 10:1, microbes play an important role in human health – not only as pathogens or benign communities, but also in association with chronic health conditions. With the emergence of new genome

sequencing platforms, it is now possible to analyze and characterize complex microbial communities quickly and efficiently, opening the door for biological studies on the role of microbiota in human health. We present a series of studies on the infant intestinal microbiome from the CHILD study which may provide clues for its putative link to childhood asthma and allergies.

**Anita Kozyrskyj and James Scott**

#### **Introduction to SyMBIOTA and Microbiome Research in Canada**

The International Human Microbiome Consortium (IHMC) has been created to coordinate microbiome research efforts internationally, with Canada contributing \$10 million through the CIHR Canadian Microbiome Initiative. One of 7 cross-disciplinary research teams funded by this initiative, SyMBIOTA (Synergy in Microbiota Research) will investigate the role of intestinal microbiota in the development of asthma and allergies using the CHILD study platform.

**Heather Maughan**

#### **Microbiome Research Methods: DNA Sequencing and Taxonomy**

Microbiome research uses next-generation sequencing to characterize the microbial content of biologic samples. As an emerging field, there are few formal methods for designing and analyzing these experiments. Current sequencing technologies will be described together with the bioinformatics methods available for translating large sequence datasets into meaningful taxonomic assignments. Common issues and challenges will be discussed.

#### **Preliminary Results from SyMBIOTA: Impact of the Home Environment on Infant Intestinal Microbiota**

**Tedd Konya, MAT**

Numerous studies have found links between infant exposures and the developing intestinal microbiome. These exposures include birth delivery mode, antibiotic use, breast or formula feeding and the mother's own microbiota. However, no one has looked at the infant's indoor environment as a source of bacterial exposure. We aimed to characterize the microbiome of infant intestine and the dust of the home where the infant lives. Confirmation of an association between these 2 microbiomes will help guide modifications of the indoor environment to promote early life gut colonization by beneficial microbes, and reduce asthma and atopic disease.

#### **Preliminary Results from SyMBIOTA: Impact of Infant Diet on Intestinal Immunity and Microbiota**

**Meghan Azad, PhD**

Breastfed infants are less likely to be colonized by *Clostridium difficile*, an intestinal pathogen associated with childhood atopy and asthma. Breastfeeding also modifies the community structure of intestinal microbiota and is an important source of immunoglobulin A (IgA), a marker of mucosal immunity. Ongoing studies from SyMBIOTA aim to investigate and characterize the potential roles of gut microbiota and IgA in the association of infant diet and *C. difficile* colonization. Full understanding of this pathway could ultimately lead to new strategies for allergic disease prevention through dietary optimization of infant gut microbiota.

**Paul Forsythe**

#### **Immunomodulation by Commensal and Probiotic Bacteria: Animal Models**

Increasing awareness of the role of commensal gut bacteria in the development and modulation of the immune system has led to great interest in the therapeutic potential of probiotics and other bacteria-based strategies for immune-related disorders. Studies in animal models have identified strong immunomodulatory effects of many nonpathogenic bacteria, showing that intestinal microbes can activate a common mucosal immune response, influencing distant sites including the respiratory tract. Respiratory effects of probiotics in animal models have included attenuating allergic airway responses and protecting against respiratory pathogens. A deeper knowledge of the interactions between administered probiotics and the existing

microbiota will be required before we can achieve clinically effective bacteria-based strategies that maintain and promote human respiratory health.

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## ***CHILD Study***

**Tim Caulfield**

### **Ethical Challenges and Cohort Studies: What Have We Learned?**

Large cohort studies are associated with a range of legal and ethical challenges. Over the past few years, emerging research – including work by our team – has shed light on the scope and nature of these issues. In this presentation, I will review what this evidence tells us about topics like consent, the right of withdrawal, incidental findings and perceptions of control of donated tissues/genetics samples. I will also consider future challenges, particularly as they relate to the CHILD study.

**Tim Takaro**

### **Using CHILD for Exploration of Common Pathways of multiple exposure effects**

A child's environment accounts for a significant proportion of their asthma disease burden, and over the first few vulnerable years of life multiple exposures are encountered. Despite advances in our understanding of the role of environment in this disease, little is known about the combined effect of the multiple, concurrent exposures children encounter today. Longitudinal studies covering the most influential periods of child development, such as the CHILD birth cohort, are optimal for addressing this challenge. In addition to providing important information on mitigatable risk factors, such an approach can also provide a platform for examination of important disease mechanisms. For example, many exposures evaluated in CHILD induce an inflammatory response in the respiratory epithelium and trigger the innate immune cascade. Genetic polymorphisms and epigenetic effects modify this response at an individual level. CHILD is well suited for these complex analyses. This presentation will describe several opportunities in CHILD for such exciting exploration.

**Stuart Turvey**

### **CHILD Study Immunology**

Antigen-dependent adaptive reactions constitute the central core of the immune-mediated pathogenesis underlying asthma. However, with recent increases in mechanistic understanding also came the realization that innate responses directly precede and shape the adaptive responses occurring in asthma. Innate immunity has thus become a highly attractive target, not only for therapeutic but also prophylactic interventions and biomarker discovery. This presentation will focus on the valuable immunological outcomes anticipated to arise from the CHILD study with specific emphasis on innate immunity.

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## ***Immune Markers and Therapeutics***

**Del Dorshied**

### **Can We Identify IL-13 Responsive Asthmatics?**

The airway epithelium serves as a physical defense barrier to the external environment for the underlying tissue and suffers frequent injury as a result. The initial response to injury is inflammation followed by debris clearance and repair. Interleukin-13 (IL-13) is known to be a key cytokine in mediating inflammatory and remodelling processes. The actions of IL-13 are mediated by IL-13 receptor  $\alpha 1$

(IL-13R $\alpha$ 1) and IL-13 receptor  $\alpha$ 2 (IL-13R $\alpha$ 2). IL-13R $\alpha$ 2, previously thought as a decoy receptor, has recently been shown to function as a signaling receptor. Appropriate control of inflammatory and repair processes is tightly regulated by the balance of IL-13R $\alpha$ 1 and IL-13R $\alpha$ 2 expression and function in response to injury. Investigation of airways from both normal and asthmatic donors have demonstrated that asthmatic airways do not express significant levels of IL-13R $\alpha$ 2 and continue to secrete IL-13 in excess relative to normals. At present our focus is developing a biomarker panel for identifying asthmatic patients with abnormalities in IL-13 response and signalling. This biomarker panel will be validated using induced sputum samples from normal and asthmatic patients, pre- and post-allergen challenge. The IL-13R $\alpha$ 2 and IL-13 SNPs of the normal and asthmatic patients will then be correlated to the expression levels of the proposed biomarkers at baseline and in response to allergen challenge. This profiling may identify subgroups of asthmatic patients for targeted therapeutic manipulation of the IL-13 signalling pathway.

**John Gordon**

#### **Tolerogenic Dendritic Cell Therapy for Allergic Disease**

Tolerogenic dendritic cells are capable of reversing the asthma phenotype in experimental animals, including bronchial responsiveness and Th2 immunoinflammatory responses. We will discuss the application of this technology in animal models of asthma, food allergies and other immunologic diseases, but also ex vivo in the context of allergic subjects.

**Tobias Kollmann**

#### **Pre-CHILD Cohort Results on Innate Immune Ontogeny**

While adaptive immune reactions represent the final common pathway in asthma and allergy, they are set into motion and are directed by the preceding innate immune response. The innate immune system functions as a sentinel, scanning the environment for signals. Upon activation, the innate immune system summarizes all environmental cues into one directive message for the adaptive immune system. This message is thus driven by environmental cues, but occur on the genetic background of the particular host. Thus a combination of host genetics and environmental stimuli together initiate the first steps towards asthma and allergy. Analyzing samples obtained from pre-CHILD cohort studies, we have deciphered a postnatal trajectory of innate immune ontogeny, and the impact various host genetic and environmental influences have on this trajectory. In this presentation we will summarize these findings and outline the steps necessary to optimally analyze samples collected in CHILD.

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### ***Asthma Education***

**Heather Castleden**

#### **Engaging Aboriginal Families Affected by Allergies and Asthma in Support-Education Program Development**

No population in Canada is in a more disadvantaged health position than Aboriginal peoples. At present, asthma and allergies are the most common chronic conditions affecting Aboriginal youth, yet interventions that focus on the support and education needs of Aboriginal youth and their families do not exist and little is known about their preferences. Over and above this disparity, systemic racism permeates the health care and education systems. Thus, despite advances in health research and health promotion, health care professionals remain unaware of context-specific cultural protocols and how to constructively and appropriately respond to the concerns of diverse Aboriginal communities. Community-based participatory research (CBPR) has become widely touted as the ideal way to engage in responsive research with Aboriginal peoples. A multi-site CBPR project currently underway is seeking to engage Aboriginal families affected by allergies and asthma in the development of culturally-appropriate social support and education programs.

**Shawna McGhan**

## **All I Really Need to Know (about Asthma), I Learned in Kindergarten:**

### **Lessons from the Roaring Adventures of Puff's 17 Years**

Applying effective knowledge translation approaches, the Roaring Adventures of Puff ("RAP") program has been promoting optimal quality of life and a higher standard of asthma control since 1994. This school-based program empowers health teams to build a rapport with children with asthma using small peer-group interaction. Using novel and flexible approaches, instructors guide children to construct their own understanding about asthma and to practice self-management skills. RAP emphasizes activity-orientated, student-centered methods of teaching in a peer environment. With the support of AllerGen NCE and other partners, and using new technology, RAP has evolved to respond to the changing needs of diverse communities, health teams and children with asthma.

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### ***Research Benefiting Patients***

#### **Nancy Fenton and Sara Shannon**

In 2006, three years after the tragic death of Sabrina Shannon the Province of Ontario passed Sabrina's Law, which requires schools to have anaphylaxis policies, to reduce allergen exposure, and to train all staff in the event of severe allergic reactions. Yet, anaphylaxis has recently been acknowledged as an emerging health risk and individuals with severe allergies trying to navigate school environments are at risk, particularly socially. In this research we worked with Sara Shannon, Sabrina Shannon's mother, to investigate the role of Sabrina's Law in decreasing the social exclusion of affected children. Using in-depth interviews with 20 youth and their parents, we explored the experiences of isolation, stigmatization, ostracization and exhibition among youth with anaphylaxis. While many elements of social exclusion still exist in various settings and across multiple scales, the results suggest that the implementation of Sabrina's Law has resulted in a reduction of experiences of exclusion. We suggest that Sabrina's Law has served to not only protect the safety of youth in the school setting, but has also begun to normalize anaphylaxis and lessen the stigma associated with this emerging health risk.

#### **Wendy Ungar**

##### **Parental Preferences for Asthma Control in Children**

Asthma is the most common chronic disease of childhood and evidence suggests that the prevalence is rising. Achieving acceptable asthma control in Canadian children has remained elusive, despite the availability of efficacious medications, clinical management guidelines and access to physician services. To design effective asthma management programs, one must closely examine the importance of the asthma control parameters describes in clinical guidelines, including frequency of exacerbations, frequency of day-time and night-time symptoms, school absences, use of beta-agonists, physical activity limitations and pulmonary function. Previous research has revealed the unique perspectives of patients and parents in how they view the attainment of asthma control in children. This study represents a collaboration between Sick Kids, UBC and the Asthma Society of Canada. In this study, 104 parents of children with asthma participated in a best/worst choice experiment. This study quantified parents' preferences with regard to individual asthma control parameters, so that relative importance from the parent's perspective could be ascertained. The study also determined how parents make trade-offs between parameters, e.g. how many nights with symptoms they would tolerate in their child to avert an emergency visit. This study also examined the impact of socioeconomic status and the child asthma history on parental preferences for asthma control. Understanding the preferences of parents and patients is critical to designing effective guidelines and asthma management programs.

#### **Additional Discussants for Interactive Panel:**



**Dr. Susan Wasserman, MD, FRCPC**, Professor, Clinical Immunology and Allergy, Department of Medicine, McMaster University, Clinician, Hamilton Health Sciences Corporation and Director, Adverse Reactions Clinic, Firestone Institute of Respiratory Health

**Dr. Larry Lynd, PhD**, Associate Professor, Faculty of Pharmaceutical Sciences, University of British Columbia, Scientist, Centre for Health Outcomes Research and Evaluation

**Discussants to be confirmed:**

Asthma Society of Canada

**Laurie Harada**, Anaphylaxis Canada

**Bill Swan** , National Asthma Patient Alliance (NAPA)

**Andrea Stevens-Lavigne** , Ontario Lung Association

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**Roger Martin - Closing Keynote Speaker**

**Innovation In Canada: Opportunities and Challenges 2012 and Beyond**

- Elucidating the difference between invention and innovation
- Identifying what Canadian researchers and educators can do to promote innovation
- The role of modern education in fostering an innovation-oriented culture
- How social and economic value is generated, exchanged and sustained in the current economic environment