reAction May 2017



AllerGen's Research Strategy implementation achieves milestone

Effective April 1, 2017, AllerGen's Patients, Policy and Public Health (PPP) Enabling Platform became fully integrated into the Network's CHILD Study and National Food Allergy Strategy (NFASt) Legacy Initiatives.

With review of the NFASt project portfolio underway, NFASt and the Canadian Food Allergy Strategic Team (CanFAST) research programs have consolidated into an integrated research and knowledge mobilization team.

To support this integration, AllerGen has realigned its research program leadership structure as follows:

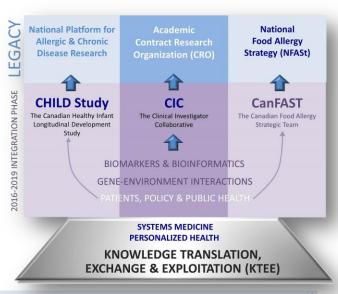
Drs Allan Becker and Susan Elliott have retired as PPP leaders as of April 1, 2017. Dr. Elliott joins Drs Ann Clarke and Jean Marshall as a co-leader of the combined CanFAST/ NFASt research team.

Dr. Becker remains a member of AllerGen's Research Management Committee (RMC) and will act as an alternate Research Leader should one of the CanFAST/ NFASt

leaders step down before March 31, 2019, when AllerGen's NCE mandate concludes.

AllerGen would like to express its sincere appreciation to Dr. Becker for his engagement and exceptional leadership since the Network's inception. His contributions have been numerous and significant.

The insight, guidance and mentorship that Dr. Becker has provided to AllerGen, its investigators, committee members, students, and staff have facilitated AllerGen's realization of social and economic benefits for Canadians and helped to bring AllerGen's research vision, mission and goals to fruition.





RESEARCH HIGHLIGHTS

Can breastfeeding help protect babies from asthma?

New research shows that breastfed babies have a reduced rate of wheezing, putting them at a lower risk for asthma later on.

New research shows that breastfed babies have a reduced rate of wheezing, putting them at a lower risk for asthma later on.

The study, by AllerGen HQP Lorena Vehling and AllerGen investigator Dr. Meghan Azad, both of the University of Manitoba, investigates the association between breastfeeding and wheezing in Canadian children.

Wheezing in early childhood is associated with an increased risk of asthma and reduced lung function later in life, and previous studies have suggested that breastfeeding helps to reduce these risks.

The new study finds that babies who are breastfed longer are less likely to wheeze, putting them at lower risk of developing asthma later on. It also finds that, among "high-risk" infants born to mothers with asthma, breastfeeding is especially protective against wheezing.

The study, "Breastfeeding, maternal asthma, and wheezing in the first year of life: a longitudinal birth cohort study," published in *European Respiratory Journal*, analyzes data from 2,700 infants and their parents participating in the CHILD Study.



Read the Press release

Read the ERJ Commentary

Read the AllerGen Research SKETCH



Molecular "fingerprinting" finds altered levels of sensor proteins in asthmatics

AllerGen researchers at McMaster University have found that people with mild allergic asthma have altered levels of "sensor" proteins that defend against infection and disease.

Toll-like like receptors (TLRs) are proteins that play a key role in detecting and responding to invading pathogens. Once activated, TLRs stimulate both the innate and the adaptive arms of the body's immune system to respond to the threat.

The **study**, which was published in March 2017 in *Clinical and Experimental Allergy*, compared the TLR levels of 11 subjects with mild allergic asthma with the TLR levels of 10 healthy controls. It found that in asthmatics, levels of certain TLR clusters are significantly lower than in individuals without asthma.

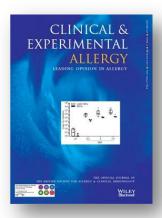
Dr. Judah Denburg led the research. Dr. Denburg is a professor in the Department of Medicine and the William J. Walsh Chair in Medicine of the Faculty of Health Sciences at McMaster, as well as Scientific Director of AllerGen.

"Using molecular phenotyping or 'fingerprinting' of specialized blood cells called hemopoietic progenitors, our team previously showed that TLR expression and responses in cord blood from 'high allergy risk' infants are altered compared to 'low allergy risk' infants," said Dr. Denburg.

"Our current study shows that this phenomenon persists in adulthood, in that TLR expression is also decreased in the adult allergic asthmatic population."

The findings support the concept that allergy is a systemic disease, and they may help to advance the development of novel therapies and diagnostics for allergic diseases and asthma.

AllerGen researchers Drs Paul O'Byrne and Patrick Mitchell, as well as former AllerGen HQP Drs Damian Tworek and Seamus O'Byrne, were study co-authors.





Why are some food allergies lifelong?

New research by AllerGen investigators Drs Manel Jordana and Susan Waserman and their team at McMaster University helps to explain why allergies to some foods, such as peanut, may persist for a lifetime.

The study, published in the Journal of Allergy and Clinical Immunology, found that long-lasting "memory" cells that are specific for the allergen are responsible for the lifelong persistence of such food allergies and, therefore, provide a key target for future therapeutic interventions.

A food allergy is an abnormal immune response to foods. The immune system mistakenly identifies a specific food allergen as harmful, and triggers the production of an antibody called IgE to neutralize it. The next time the food is consumed, the IgE antibodies recognize it and signal the immune system to react.

"We found that the cells that produce IgE actually have a much shorter lifespan than previously thought, and that they must be frequently replenished to perpetuate a long-lasting food allergy," said Dr. Jordana, a Professor of Pathology and Molecular Medicine at McMaster.

"We wanted to understand the biological mechanisms underlying that 'replenishment."

The researchers conducted long-term studies using a murine (mouse) model that mimics several features of human food

allergy. They observed that serum levels of IgE to peanut decreased over time.

However, allergen exposure re-established IgE levels and, subsequently, the ability of mice to experience anaphylaxis.

The body's memory cells specific for the allergen last for virtually a lifetime and are responsible for maintaining clinical reactivity, according to Dr. Rodrigo Jiménez-Saiz who, along with AllerGen HQP Dr. Derek Chu, is one of the first coauthors of the study.

"These cells 'remember' the food allergen they are specific for, and upon reencountering the allergen they become activated and replenish the cells that produce IgE antibodies, which ultimately mediate the allergic reaction," he said.

The findings can be extrapolated to explain lifelong food allergies in humans, and represent an "important step in identifying memory cells as a therapeutic target with disease-transforming potential," commented Dr. Jordana.

Currently, the McMaster team is intensely investigating these concepts in humans. The research was funded by AllerGen NCE and grants from Food Allergy Canada, MedImmune LLC and the National Institutes of Health.



Pet exposure in early life affects infant gut microbiota



Owning a cat or dog might be a good thing when it comes to reducing the risk of childhood allergies and obesity, according to new findings from the Canadian Healthy Infant Longitudinal Development (CHILD) Study.

The research, published in the journal *Microbiome* and highlighted in *Nature Outlook*, found that babies exposed to furry pets in early life had higher levels of two bacteria that may protect against allergic disease and childhood obesity.

"The abundance of these microbes, which help to train a baby's developing immune system, was increased two-fold in babies living with pets in the household," says the study's senior author, Dr. Anita Kozyrskyj, an AllerGen investigator and a professor in the Department of Pediatrics at the University of Alberta.

Press release | CBC story

Exploring virtual breastfeeding communities: An AllerGen event-inspired project

What do Instagram, breastfeeding, a Manitoba-based epidemiologist and an Alberta-based digital technology expert have in common?

They all come together in a new research project, with the AllerGen Network as the catalyst.

At AllerGen's 2016 Research Conference in Vancouver, BC, Alessandro Marcon, an AllerGen HQP with the University of Alberta's Health Law Institute (HLI) and specialist in digital technologies and social media, approached AllerGen investigator Dr. Meghan Azad, an epidemiologist and community health scientist interested in the developmental origins of health and disease (DOHaD).

Mr. Marcon heard Dr. Azad speak at the conference about why some women are unable to breastfeed their infants for the length of time recommended by the World Health Organization (WHO) to maximize health benefits, and he had an idea for further research into the topic—and its intersection with the online world.

Their meeting spawned a unique project exploring whether or not Instagram users are building communities of support around women who breastfeed.

Read more



AWARDS & HONOURS

Honours for Dr. Malcolm Sears



CHR Researcher of the Month

"An innate curiosity, rugged determination, keen power to intuit observations, and capacity to think and act outside the box"—qualities of AllerGen Research Leader Dr. Malcolm Sears highlighted by Canadians for Health Research (CHR) as they honoured him as their "Researcher of the Month" for February 2017.

In a brief survey of his career, the CHR profile lists some of Dr. Sears' most significant accomplishments, ranging from his involvement in the Dunedin birth cohort study, to his "paradigm-shifting" discovery that regular use of a once-commonly prescribed asthma treatment worsens rather than alleviates severe asthma, to his founding of AllerGen's CHILD Study.

The CHR "Researcher of the Month" program profiles "the scientists conducting some of the most interesting research in Canada today."

Read the CHR profile of Dr. Sears

New Zealand Prime Minister's Science Prize

Dr. Sears was also co-recipient of New Zealand's Prime Minister's Science Prize for 2016.

The prize went to the 10 key researchers leading the Dunedin Multidisciplinary Health and Development Research Study, a longitudinal birth cohort study that, for over four decades, has been following 1,000 children born in the mid-1970s in the city of Dunedin, New Zealand.

"This is a great tribute to 45 years of work and two very focused Directors, and a testimony to the value of longitudinal studies," says Dr. Sears, who was the original leader of the asthma and allergy component of the study.

The Prize recognizes a transformative scientific discovery or achievement that has had a significant impact in New Zealand or internationally in the previous five years.

Read more



Dr. Paul O'Byrne recognized as a "giant" in chest medicine

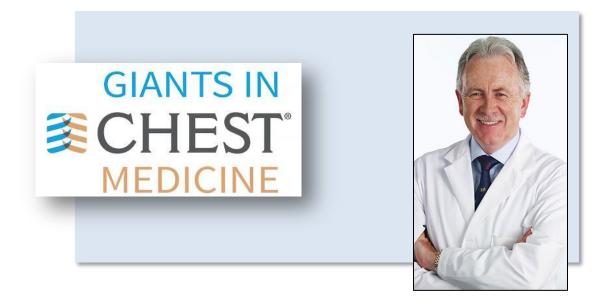
"Many of us would agree that a career in academic medicine is the best job in the world," begins the *Giants in Chest Medicine* profile of Dr. Paul O'Byrne, "and would add that Professor O'Byrne may, in fact, be one of the best role models in the world for this particular career pathway."

The profile celebrates the academic, teaching, clinical and personal virtues of Dr. O'Byrne. It was published in the March 2017 issue of *CHEST*, the official publication of the American College of Chest Physicians.

The article is accompanied by a video interview, in which Dr. O'Byrne discusses his life's journey and career accomplishments.

"We are blessed to have Paul as a member of our medical staff for so many years," commented the Chief and the Deputy Chief of Staff for St. Joseph's Healthcare Hamilton regarding this "impressive publication" and "very inspiring" interview.

Dr. O'Byrne is Co-Leader of AllerGen's Clinical Investigator Collaborative (CIC) Legacy Project. He was selected to the Royal Society of Canada in 2010 and the Canadian Academy of Health Sciences in 2015. In July 2016, Dr. O'Byrne became Dean and Vice-President of the Faculty of Health Sciences at McMaster University.



Let Them Eat Dirt on 2016 Science Book Awards shortlist

Let Them Eat Dirt, a book based on research into how the microbes in our body contribute to our lifelong health, is on the shortlist for the 2016 Science in Society General Book Award.

AllerGen investigator Dr.
B. Brett Finlay and
AllerGen HQP Dr. MarieClaire Arrieta coauthored the book,
which includes results
from their cutting-edge
work leveraging data
from the CHILD Study.

The book has captured international attention and been featured widely in major media outlets including Good Morning America, National Public Radio (NPR), the Wall Street Journal and CBC's The Current.

"We were thrilled to hear about this nomination," says Dr. Arrieta. "Regardless of the outcome, this will help us spread our message about the microbiome even further."

Dr. Finlay says the significant commitment of time and energy involved in writing the book and fielding the hundreds of related media requests is "an important part of being a scientist."

"Scientists are paid by taxpayers to engage in discovery initiatives in the lab," he says. "We have to show that every day the scientific process is opening up new knowledge that may improve our world."

The award, sponsored by The Canadian Science Writers'
Association (CSWA),
honours outstanding
contributions in science
writing.

The books selected
must be understandable
to the layperson, and are
judged on various criteria
including literary
excellence, scientific content

promoting greater understanding of science by the general reader.

and accuracy, and value in

The 2016 winner will be announced in the spring of 2017. AllerGen investigator Professor Timothy Caulfield won the award in 2015 for his book Is *Gwyneth Paltrow Wrong About Everything*?



Dr. Greg Evans named 3M Teaching Fellow

AllerGen investigator Dr. Greg Evans, a professor of chemical engineering at the University of Toronto (U of T), has been named a 2017 3M National Teaching Fellow.

The Fellowship is the only pan-Canadian, cross-disciplinary recognition of leader-ship and excellence in university teaching.



Dr. Greg Evans

This is one in a series of teaching awards received by Dr. Evans, including the U of T's 2015 President's Teaching Award and the 2013 Northrop Frye Award.

"Dr. Evans is a visionary mentor and supervisor," comments U of T PhD candidate and AllerGen trainee Natalia Mykhaylova.

Dr. Evans is active in AllerGen's Gene-Environment Interactions Enabling Platform, where he is playing a lead role in the development of a new technology (*AirSENCE*) for measuring air quality.

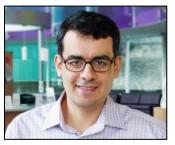
Read about Dr. Evans and the other 2017 3M Fellows in *Maclean's* magazine.

Dr. Mohsen Safavi receives 2017 GSK/CSPS Early Career Award

AllerGen investigator Dr. Mohsen Safavi, an assistant professor of pharmaceutical sciences at The University of British Columbia, has been recognized jointly by the Canadian Society for Pharmaceutical Sciences (CSPS) and GlaxoSmithKline (GSK) with a 2017 GSK/CSPS Early Career Award.

Dr. Safavi is an epidemiologist/ outcomes researcher focusing on asthma and COPD. His Respiratory Evaluation Sciences Program (RESP) is developing innovative analytic approaches—in decision analysis, health economics and outcomes research—to help improve efficiency in respiratory care in Canada.

The GSK/CSPS Early Career Award recognizes outstanding research achievements and contributions by pharmaceutical scientists within seven years of their having completed a doctoral degree. The award will be presented at the CSPS Annual Symposium, May 10–12, 2017, in Montreal, QC.



Dr. Mohsen Safavi



PEOPLE & PARTNERS

AllerGen, CHILD Study showcased in Hong Kong

The annual 13CARE Workshop focuses on the emerging concept of the exposome, toward developing new collaborative research projects. At the 2017 workshop in Hong Kong, AllerGen research and investigators were notably represented.

AllerGen HQP **Dr. Michelle North** presented on her recent work evaluating the oxidative potential of house dust using samples from the CHILD Study.

Dr. Jeff Brook, an AllerGen Research Leader and PI of CANUE, discussed how the exposome concept can be used to integrate environmental exposure assessment across the life course, using the CHILD Study as a case in point.

AllerGen investigator **Dr. Greg Evans** presented on the *AirSENCE* portable air quality measurement devices developed in his lab with AllerGen support.



Dr. Jeffrey Brook



Dr. Michelle North

Former McMaster president, AllerGen Board Member dies

Dr. Peter George, the longest-serving president of McMaster University, died on April 27, 2017, at the age of 75.

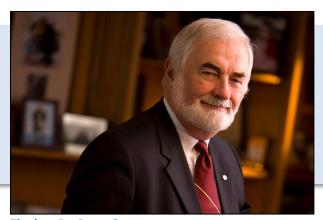
Dr. George was university president for 15 years, between 1995 and 2010. In that capacity, he served as a member of AllerGen's Board of Directors for the Network's first five years.

Dr. George was a strong proponent of the networked, collaborative approach to research undertaken by AllerGen and was a key supporter of AllerGen during its early years of operation.

He will be greatly missed by AllerGen's Board of Directors, Network Executives, Administrative Centre staff and Network investigators.

Read the Hamilton Spectator story

Read the McMaster statement



The late Dr. Peter George



KNOWLEDGE MOBILIZATION

First AllerGen Research SKETCHES lay summaries now online

AllerGen's Research SKETCHES online database has been launched, together with the first two SKETCHES, prepared by AllerGen HQP Lorena Vehling and Michelle North.

The Research SKETCHES program builds capacity and expertise among AllerGen trainees to translate AllerGenfunded research into simple, accessible clear language summaries intended for dissemination to a broadly based lay audience.

Visit Research SKETCHES—and let us know what you think!

AllerGen gratefully acknowledges the support of McMaster University's Media Production Services and ResearchSNAPS toward the creation of the Research-SKETCHES database, and the development of the clear-language summary template by Research Impact at York University.







New microbiome book highlights AllerGen research

A new book, describing the "seed-and-feed" process by which a baby's gut microbiome is established, features AllerGen investigator Dr. Anita Kozyrskyj and her research using CHILD Study data.

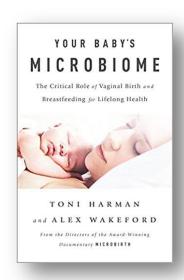
Written for the general public, Your Baby's Microbiome: The Critical Role of Vaginal Birth and Breastfeeding for Lifelong Health presents the latest scientific evidence on how caesarean section deliveries, antibiotic use and formula feeding may interfere with the critical transfer of microbes from mother to baby.

The authors explain how this depletion of bacterial diversity puts infants at increased risk of developing various diseases later in life.

The book draws on research undertaken for the award-winning documentary film *Microbirth*, and was originally published in 2016 in the UK under the title *The Microbiome Effect*.

According to Dr. Kozyrskyj, the authors will also release an online course based on findings from the CIHR-funded Synergy in Microbiota Research (SYMBIOTA) project, which uses data and biological samples from the CHILD Study.

Dr. Kozyrskyj was one of the 12 scientific experts selected by the filmmakers/ authors for interviewing, based on her co-authorship of the paper "Gut Microbiota of Healthy Canadian Infants: Profiles by Mode of Delivery and Infant Diet at 4 Months," which was published in the Canadian Medical Association Journal in 2013 and received that year's CMAJ Bruce Squires Award for the paper most relevant to clinical practice.





CHILD Study highlighted at Sandbox Summit

On April 6, 2017, AllerGen and the CHILD Study participated in the 2017 Sandbox Summit—the 6th annual conference hosted by The Sandbox

Project, an AllerGen Legacy Partner, in Toronto.

The Summit provided an important opportunity for The Sandbox Project and the CHILD Study to engage with diverse organizations around a shared mandate for knowledge mobilization and social, health and wellness impacts.

Dr. Meghan Azad (University of Manitoba) delivered a presentation on the CHILD Study, and shared the 2016 CHILD Study video on the link between air pollution and allergic sensitization.

In two break-out sessions, Summit delegates contributed to discussions about the CHILD Study hosted by Dr. Azad.

In the first session, participants proposed KT strategies for three Study findings—on the health effects of exposure to: traffic pollution, artificial sweeteners during

pregnancy, and antibiotics during labour.

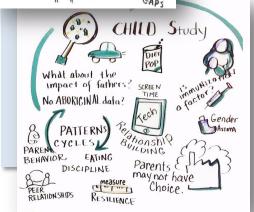
Delegates were asked: "Who needs to know about these findings and how do we reach those people?"

In the second session, participants were invited to help formulate the research questions to be pursued in the Study's next phase (following the participating children from age 8 to 14 years). They were asked: "What do you consider to be the top health research priorities for the Study as the

children enter elementary school and continue on through high school?"

The feedback collected in these sessions will inform the planning of future research and knowledge mobilization strategies for the Study.





Images created at the Summit through real-time graphic facilitation. Artist: Playthink's Patricia Kambitsch

The Summit exposed a range of leaders in child and youth health to the CHILD Study and its importance, raising its profile among a key group of stake-holders and facilitating the forging of ties between Study personnel and potential future collaborators and knowledge users.



HQP NEWS

Paper selected as "Editor's Choice" by JACI

A new study by AllerGen HQP Dr. Jyoti Balhara and her PhD supervisor Dr. Abdelilah Soussi Gounni was selected as an Editor's Choice report by the *Journal of Allergy and Clinical Immunology* (JACI).

In the study, the researchers found a novel role of pentraxin 3 (PTX3) in the development of allergic inflammation.

PTX3 is an immune system molecule shown to provide protection again lung infections. Dr. Soussi Gounni's group studied its role in allergen-induced lung inflammation, which is often observed in asthma. In a mouse model of experimental asthma, they found that an absence of PTX3 resulted in increased inflammation.

"Although our research on PTX3 and allergic asthma is at an early stage, it provides key insights about the previously unknown mechanisms involved in the development of allergic inflammation," said Dr. Balhara.

"This information will be critical in finding new treatments for allergy and asthma."

The study was performed in the Department of Immunology at the University of Manitoba.

Michelle North joins Novartis

AllerGen HQP Dr. Michelle North is now Ontario Medical Science Liaison, Respiratory, with Novartis Canada, the Switzerland-based global healthcare company.

Dr. North completed a postdoctoral fellowship at Queen's University and Kingston General Hospital on the topic of "environmental exposures and epigenetic mechanisms in the developmental origins of allergic disease." In 2015, she was a Visiting Research Fellow at the Harvard T.H. Chan School of Public Health, with support from AllerGen's *International Research Visit Program*.

Marie-Claire Arrieta publishes microbiome e-book

AllerGen HQP Dr. Marie-Claire Arrieta, coauthor of *Let Them Eat Dirt*, has now published an e-book through the University of Calgary that offers parents practical advice on how to cultivate a healthy microbiome in their children.

Mighty Microbiome: Helping Your Child Build a Strong Immune System discusses everything related to microbiome-building, from birth method, to the importance of pets, the applicability of the "five-second rule," and the question of sandbox hygiene.



WIN \$1000

SUBMISSION DEADLINE June 30, 2017



2017 ALLERGEN HQP VIDEO COMPETITION

Bring your research to life!

Create a short, original knowledge translation video that will increase awareness and understanding of your allergic disease research among a non-scientific audience.

AllerGen ResearchSKETCHES



Share your research BEYOND the readers of peer-reviewed journals.

AllerGen ResearchSKETCHES

Short lay summaries of peer-reviewed single research studies that answer:

- what is the research about?
- what did the researchers do?
- what did they find?
- how can the research be used?

GUIDELINES

Applications accepted on an ongoing basis

Open to ASNPN members who have co-authored a paper:

- based on an AllerGen-funded research study
- that has been published, or been submitted for publication, in a peer-reviewed journal

Aims to:

 make AllerGen research accessible to a broader audience and highlight novel, high-impact findings.

An HQP whose paper is selected as a *SKETCH* will be trained in clear language writing principles and receive a \$500 award upon completion.



MEDIA

AllerGen Researchers in the News



Dr. Brett Finlay

• Consumer Reports, Toronto Sun

Dr. Anne Ellis

Global News, CHED, CKWS, theWhig

Dr. Michael Brauer

 CBC, Washington Post, Vancouver Sun, USA Today, Ubyssey, Rapid City Journal, Toronto Star

Dr. Anita Kozyrskyj

 Hamilton Spectator, Toronto Star, Edmonton Sun, CTV, CBC, Science Daily, USA Today, Global News, New York Daily News, Huffington Post, Reader's Digest

Dr. Sonia Anand

Hamilton Spectator CBC, Hamilton News

Prof. Timothy Caulfield

 Forbes, CBC, National Post, New York Post



The Economist magazine highlights the CHILD Study in its February 25, 2017 issue. The article, "Four good bugs," profiles research led by AllerGen investigators Drs Brett Finlay and Stuart Turvey looking at the relationship between gut bacteria and asthma risk using CHILD Study samples.

reAction May 2017



EVENTS

Resources are available for the AllerGen webinars you may have missed...



Stock epinephrine in public settings: a free Food Allergy Canada webinar

For Food Allergy Awareness Month, AllerGen Legacy Partner Food Allergy Canada is hosting a webinar on the benefits and legal implications of having stock epinephrine in public settings.

AllerGen investigator Dr. Susan Waserman and lawyer Bethan Dinning will present.

The session will be geared towards food service, industry and government staff, but anyone interested in the topic is welcome to attend.

The webinar will take place on Monday, May 15, 2017, from 1:00 to 2:00 pm EDT.

Register here.



Send newsletter enquiries and comments to:

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