AllerGen NCE Inc. is hosted at McMaster University, Hamilton, Ontario, Canada.

AllerGen NCE Inc. is supported by the Government of Canada through the Networks of Centres of Excellence (NCE) program.

Created in 1989, the NCE program is a joint initiative of the Natural Sciences and Engineering Research Council, the Social Sciences and Humanities Research Council, the Canadian Institutes of Health Research, and Innovation, Science and Economic Development Canada (formerly Industry Canada).

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Aussi disponible en français
In November 2015, AllerGen secured its final three years of federal funding through the Networks of Centres of Excellence (NCE) program.
Corporate Profile

AllerGen NCE Inc. (AllerGen), the Allergy, Genes and Environment Network, is a national research network that aims to help Canadians address the challenges of living with asthma, allergies, anaphylaxis and related immune diseases.

AllerGen was established in 2004 by Innovation, Science and Economic Development Canada (formerly Industry Canada) through the Networks of Centres of Excellence (NCE) Program.

For more than a decade, AllerGen research teams have generated new knowledge, advanced drug development, laid the groundwork for significant future discoveries, forged a strong national research community in allergy, asthma, and anaphylaxis, and expanded related research and clinical training opportunities to nurture a new generation of leaders in the field.

In 2015-2016, AllerGen received $4,216,500 in funding from the NCE program. Through strong partnerships, AllerGen secured additional funding from other sources to achieve an annual NCE leveraging ratio of 1:1.93.

2015-2016 At-a-Glance

- 318 trainees and young professionals, research associates and technicians
- 184 network participants (full-time equivalent)
- 125 partner organizations across academia, industry, not-for-profit and government sectors
- 94 network investigators
- 31 active research projects and strategic initiatives
- 18 international partners

AllerGen’s Vision

To create an enduring network of allergy and immune disease experts whose discovery and development efforts contribute to reducing the impact of allergic and related immune diseases nationally and globally.

AllerGen’s Mission

To catalyze and support discovery, development, networking, capacity building, commercialization and knowledge translation to reduce the morbidity, mortality and socioeconomic burden of allergy, asthma and anaphylaxis for the benefit of Canadians and the global community.
Message from the Board Chair and Scientific Director

Among other enduring legacies, AllerGen will ensure that:

- the Canadian Healthy Infant Longitudinal Development (CHILD) Study continues to generate novel research opportunities and to facilitate ground-breaking discoveries about the early-life origins of allergies, asthma, and other chronic, non-communicable diseases;
- the Clinical Investigator Collaborative (CIC)—a world leader in conducting Phase II clinical trials of new drugs for managing asthma and allergies—emerges as a self-sustaining Academic Contract Research Organization (A-CRO);
- Canadian Food Allergy Strategic Team (CanFAST) research lays the foundation for the creation of an AllerGen-enabled National Food Allergy Strategy, which, in turn, will disseminate the best evidence on the diagnosis, treatment and management of food allergies and anaphylaxis to patients and policymakers;
- an initiative to integrate data and share biological samples across the Network, using a systems medicine approach informed by the concept of “personalized health,” amplifies the usefulness of the Network’s findings; and
- the enduring value of AllerGen’s investments in Highly Qualified Personnel (HQP) is made evident through the career trajectories of researchers trained over the lifespan of the Network.

Network participants registered numerous accomplishments in 2015-2016. AllerGen researchers and teams leveraged the Network structure and its array of disciplinary expertise to secure funding for new national networks and team grants.

The publication of Network research in high-impact journals further accelerated, with 399 new publications during the year, bringing the total number of AllerGen publications, presentations and abstracts to over 3,900 since 2005.

Breakthrough scientific findings arising from AllerGen research investments achieved national and international impact and exposure. Representing the largest survey to date on the prevalence of food allergies in Canada, CanFAST research published in October 2015 will be used as a baseline to gauge
if food allergy rates have since been rising or falling. The Cross-Canada Anaphylaxis R Egistry (C-CARE) project compiled a fourth year of data and published important findings on the underuse of epinephrine, the likelihood of anaphylaxis recurrence, and increasing anaphylaxis rates among Canadian children.

Cross-Network collaborations between researchers from AllerGen’s Gene-Environment Interactions and Biomarkers & Bioinformatics Enabling Platforms resulted in new insights into how diesel exhaust and inhaled allergens provoke molecular changes in the lung tissue of allergy-prone individuals—opening the door to improved prevention strategies and treatments for allergic diseases.

The CHILD Study enabled four scientific discoveries that are delivering seminal new knowledge on the early-life microbiome “window” and its role in the development of allergies and asthma; the impact of antibiotics during delivery on the infant gut microbiome; and the relationship between a mother’s prenatal diet and her baby’s early physical and cognitive development. These findings attracted worldwide media attention from outlets including TIME, Maclean’s, Fox News, Washington Post, BBC, CTV News, Global News and the LA Times, among many others.

Innovations arising from Network research resulted in four intellectual property disclosures, three licences granted or under negotiation, and three patents filed during the year. The output of Network press releases and associated media coverage was likewise significant, resulting in national and international exposure for AllerGen researchers and teams. Network investigators also contributed to public discourse on topics ranging from the stigma of food allergies to pseudoscience and alternative medicine practitioners.

AllerGen’s work is of tremendous importance to Canadians. The Network’s achievements—an expression of our members’ shared commitment to making social and economic impacts—are due to the efforts and dedication of our investigators and HQP, our partners, the Board of Directors, the administrative team, and Research Management Committee (RMC) and advisory committee members.

We appreciate and thank all those individuals and teams, as well as the NCE Secretariat and AllerGen’s host institution, McMaster University, for their ongoing support of AllerGen’s vision, mission and goals.
Researchers using data from AllerGen’s CHILD Study have traced a solid line between specific bacteria in an infant’s gut and the risk of developing asthma.
"Our findings emphasize the importance of the gut microbiome in asthma and point to a window in the first 100 days or so of life when disruptions in the gut’s normal bacterial composition can derail the immune system and lead to asthma down the road," says Dr. Finlay.

Four gut bacteria may help protect kids from asthma

If you were holding a baby in your arms and wondered if an asthma diagnosis lay in its future, the baby’s diaper might be the last place you would think to look for an answer. But think again: researchers using data from AllerGen’s Canadian Healthy Infant Longitudinal Development (CHILD) Study have traced a solid line between specific bacteria in an infant’s gut and the risk of developing asthma.

The research, published in *Science Translational Medicine* in September 2015, found that infants with low levels of four gut bacteria, abbreviated as FLVR (*Faecalibacterium*, *Lachnospira*, *Veillonella*, and *Rothia*), at three months of age had a significantly higher risk of asthma.

AllerGen investigators Dr. Brett Finlay, a micro-biologist and Peter Wall Distinguished Professor at The University of British Columbia (UBC), and Dr. Stuart Turvey, a pediatric immunologist at BC Children’s Hospital and Aubrey J. Tingle Professor in Pediatric Immunology at UBC, led the research.

Most infants acquire the FLVR bacteria naturally from their environment. However, some babies are not exposed to them for various reasons, including cesarean-section delivery, or their FLVR levels are diminished due to antibiotic use.

"Our findings emphasize the importance of the gut microbiome in asthma and point to a window in the first 100 days or so of life when disruptions in the gut’s normal bacterial composition can derail the immune system and lead to asthma down the road," says Dr. Finlay.

From the stool samples of 319 children enrolled in the CHILD Study, the researchers pieced together a picture of the babies’ gut environments and the bacteria living there. They assessed the children for early signs of allergies and asthma during clinical check-ups at one and three years of age. Children with low levels of FLVR at three months of age were more likely to wheeze and to have positive allergy skin tests (telltale signs of future asthma) at one year, even if their FLVR levels had normalized. The researchers then confirmed the protective effect of FLVR in mice.

The study grabbed worldwide attention, generating over 400 international headline stories within 24 hours.

The FLVR discovery could profoundly impact medical practice. “Although more research is needed, this
“We received emails from families affected by asthma thanking us for this work,” adds Dr. Turvey. “We believe this outpouring of gratitude attests to the burden that asthma places on families. People are eager for anything that might help—even bacteria.”

Increasing cases of anaphylaxis among children

Are anaphylaxis rates rising in Canada? Unfortunately, it seems so.

Anaphylaxis—a sudden and potentially life-threatening allergic reaction—is increasing among children, according to a new study compiling four years of data from AllerGen’s Cross-Canada Anaphylaxis REgistry (C-CARE).

The study’s findings reveal that the percentage of emergency department (ED) visits due to anaphylaxis doubled between 2011 and 2015, at the Montreal Children’s Hospital of the McGill University Health Centre (MCH-MUHC) in Montreal, QC.

“With the rising rates of allergies among Canadian children, we were interested in determining if anaphylaxis rates are also increasing,” says Dr. Moshe Ben-Shoshan, the AllerGen investigator who leads C-CARE. “Our findings suggest a worrisome increase in anaphylaxis rates that is consistent with a reported worldwide increase.” Dr. Ben-Shoshan is a pediatric allergist and immunologist at the MCH-MUHC, and an assistant professor of Pediatrics at McGill University.

Published as a Letter to the Editor in the Journal of Allergy and Clinical Immunology, the study also identified a serious underuse of epinephrine auto-injectors: just over 50% of those who had an auto-injector used it before they got to the ED, and not using it increased the risk that multiple epinephrine doses would be administered in hospital.

Funded by AllerGen, C-CARE was launched in 2010 and has since collected data from thousands of adults and children treated for anaphylactic reactions. Hospitals, ambulance paramedics, and allergy clinics in Quebec, British Columbia and Ontario contribute data to the registry, and expansion to other parts of the country is underway. It is the first registry in the world to track episodes of anaphylaxis at the time they occur.

“Canadian data on anaphylaxis are sparse and imprecise,” says Dr. Moshe Ben-Shoshan. “The C-CARE database is critical to provide an improved understanding of anaphylaxis—what causes it, how often it occurs, whom it affects, and how it is being treated.”
Dr. Ben-Shoshan and his collaborators believe C-CARE, which has partnership and support from Health Canada and other organizations, is a powerful tool that will improve the management of severe allergic reactions from both a medical and a public health perspective.

“The registry has already helped us to identify which foods are the most common anaphylactic triggers for children and adults, the annual incidence of recurrent anaphylaxis in children, and the frequency of accidental exposure to known allergens,” he says. Health Canada will use C-CARE results to evaluate the role of health policies, particularly those related to food labelling, in the prevention of anaphylaxis in Canada.

As C-CARE expands across the country, it will support the development of a National Food Allergy Strategy for Canada—an AllerGen Legacy initiative that aims to maximize choice and minimize risk for individuals affected by food allergies, inform public policy and educational programming, and facilitate public engagement, debate and dialogue.

**CIHR grants $6M to CHILD Study research**

In 2015-2016, three projects using data from AllerGen’s Canadian Healthy Infant Longitudinal Development (CHILD) Study were awarded approximately $2 million each, for a total of nearly $6 million over five years, by the Canadian Institutes of Health Research (CIHR), the federal agency responsible for funding health research in Canada.

“These major funding awards attest to the value of the CHILD Study as a key tool for understanding the effects of genes and the environment on children’s health,” comments Dr. Malcolm Sears, CHILD Study Director at St. Joseph’s Healthcare Hamilton and a professor of medicine at McMaster University.

CHILD Study research teams led by Dr. Stuart Turvey (The University of British Columbia) and Dr. Padmaja Subbarao (University of Toronto) are behind two of the winning grants. Dr. Turvey’s team will investigate how a child’s environment interacts with his or her genome in the development of asthma, as a means to better predict who will get asthma and how it can be prevented. Dr. Subbarao’s team will study gene and environment effects on lung growth and the risk of developing chronic respiratory disease, asthma and chronic obstructive pulmonary disease (COPD).

A third project, led by Dr. Vern Dolinsky (University of Manitoba), will link to CHILD Study data to explore how environmental exposures during pregnancy are associated with childhood obesity, as a step towards preventing obesity and cardiometabolic disease.

Only eight Canadian research teams—of which three were CHILD Study-related—were awarded funding in the CIHR competition for Programmatic Grants in Environment, Genes and Chronic Disease.

“The broad scope of these projects illustrates how the wealth of data and biological samples in the CHILD Study can inform not only studies of asthma and allergy, as originally proposed, but also studies of the origins of many other chronic diseases of later childhood and adulthood,” observes Dr. Sears. “The CHILD Study has become an international resource for multiple research endeavours that will inform scientific, government and public stakeholders for decades to come.”

Funded by CIHR and AllerGen, the CHILD Study is collecting a vast range of health, lifestyle and environmental exposure information from more than 3,500 mothers and children from pregnancy to age five. The study involves four provinces (British Columbia, Alberta, Manitoba and Ontario), over 40 multidisciplinary researchers, and more than 100 students and research staff.
Innovations arising from Network research resulted in four intellectual property disclosures, three licenses granted or under negotiation, and three patents filed during the year.
AllerGen’s Integrated Research Program

In 2005, despite an explosion in the prevalence of allergies and asthma, Canada had no coordinated research community in allergic disease and asthma; no national discussion about best practices in related clinical fields; and no focus on developing much needed expertise in clinical care, scientific research or academia. Since 2005, AllerGen has been successfully filling these gaps.

Led by internationally recognized Canadian researchers with expertise across a wide range of disciplines, the Network’s 31 active research projects and strategic initiatives aim to promote earlier diagnosis, disease interception, better treatment, and optimal outcomes for Canadians with allergic diseases.

AllerGen’s Integrated Research Program

AllerGen Legacy Projects:
- The Canadian Healthy Infant Longitudinal Development (CHILD) Study
- The Clinical Investigator Collaborative (CIC)
- The Canadian Food Allergy Strategic Team (CanFAST)

AllerGen Enabling Platforms:
- Gene-Environment Interactions
- Biomarkers and Bioinformatics
- Patients, Policy and Public Health

Through strong partnerships, in 2015-2016 AllerGen leveraged its research investments to generate an additional $8.1 million in cash and in-kind support from partner and stakeholder organizations over the year—a leveraging ratio of 1:1.93.
The Canadian Healthy Infant Longitudinal Development (CHILD) Study

Research Leaders:
- Dr. Malcolm Sears, Professor, Division of Respirology, Department of Medicine, McMaster University
- Dr. Padmaja Subbarao, Director, Pulmonary Function Laboratory, The Hospital for Sick Children; Associate Professor, Department of Paediatrics, University of Toronto

Strategic Focus:
- the largest birth cohort study ever conducted in Canada, following over 3,500 Canadian children and their families
- enabling breakthrough discoveries about the early-life origins of asthma, allergy and other chronic diseases
- an unprecedented pool of early-life human genetics, epigenetics and microbiome data linked with birth cohorts across the world
- involves over 40 researchers/scientists from 30 disciplines and more than 100 research staff and trainees
- in the long term, the CHILD Study will lead to strategies for disease interception, prevention and cure

The Clinical Investigator Collaborative (CIC)

Research Leaders:
- Dr. Paul O’Byrne, Professor and Chair, Department of Medicine, McMaster University
- Dr. Parameswaran Nair, Canada Research Chair and Professor of Medicine, Division of Respirology, McMaster University; Adjunct Professor of Medicine, McGill University; Staff Respirologist, St Joseph’s Healthcare Hamilton
- Dr. Anne Ellis, James H. Day Chair in Allergic Disease and Allergy Research, Associate Professor and Chair, Division of Allergy and Immunology, Department of Medicine, Queen’s University

Strategic Focus:
- a multi-centre, Canadian-based Phase II clinical trials group that evaluates potential drug candidates for the treatment of allergic asthma, severe asthma and allergic rhinitis
- delivers accurate, rapid and cost-effective early-stage results using a globally unique allergen challenge model and proprietary SOPs
- offers academic leadership in drug development research, conducts add-on experiments to establish the mechanism of action for experimental drugs, and publishes novel data in high-impact peer-reviewed journals

The Canadian Food Allergy Strategic Team (CanFAST)

Research Leaders:
- Dr. Jean Marshall, Professor, Departments of Microbiology & Immunology and Pathology, Dalhousie University
- Dr. Ann Clarke, Professor, Division of Rheumatology, Department of Medicine, University of Calgary; The Arthritis Society Chair in Rheumatic Diseases

Strategic Focus:
- a national, transdisciplinary research consortium that produces new knowledge of food allergy and translates it into clinical and public health practice
- measures the prevalence and socioeconomic impacts of food allergy and anaphylaxis among Canadians
- is co-developing with multiple stakeholders a National Food Allergy Strategy (NFAST) for Canada: a Knowledge Mobilization platform that will position Canada as a global leader in improving the management of food allergy across environments and settings
Gene-Environment Interactions
Research Leaders:
Dr. Andrew Sandford, Professor,
Department of Medicine,
The University of British Columbia
Dr. Jeffrey Brook, Senior Scientist,
Air Quality Research Branch, Environment Canada, Assistant Professor,
Division of Occupational & Environmental Health, Dalla Lana School of Public Health, University of Toronto

Strategic Focus:
• a collection of well-established teams working nationally and globally on genetic, environmental and epigenetic research to facilitate the development of public health interventions and policies relevant to asthma and allergies
• generates critical exposure data on maternal/family stress, chemicals and traffic-related air pollution
• aims to discover novel therapies and diagnostics, and to promote advancements in personalized health to tackle the rising burden of chronic, non-communicable diseases

Biomarkers and Bioinformatics
Research Leaders:
Dr. Kelly McNagny, Professor,
Department of Medical Genetics, Co-Director,
The Biomedical Research Centre,
The University of British Columbia
Dr. Dean Befus, Professor,
Division of Pulmonary Medicine,
Department of Medicine, University of Alberta
Dr. John Gordon, Professor,
Division of Respirology, Critical Care & Sleep Medicine, Department of Medicine, University of Saskatchewan

Strategic Focus:
• unites leading scientists across the country to discover and develop diagnostic, prognostic, therapeutic and mechanistic biomarkers for asthma and allergies
• helps to develop emerging therapies, advance new diagnostic and healthcare options, and to integrate data from across the Network to accelerate advances in patient care and public health
• focuses on disease susceptibility, early diagnosis, discriminating disease sub-types, monitoring drug response, and identifying novel therapeutic targets

Patients, Policy and Public Health
Research Leaders:
Dr. Allan Becker, Professor and Head,
Section of Allergy and Clinical Immunology,
Department of Pediatrics & Child Health, University of Manitoba
Dr. Susan Elliott, Professor,
Department of Geography and Environmental Management, University of Waterloo

Strategic Focus:
• a platform harnessing interdisciplinary expertise to translate AllerGen research into new evidence-based policies, practices, products and services for the benefit of patients and health professionals
• aims to develop educational and disease management tools, promote public awareness and deliver new knowledge to end-user groups that can apply it for maximum impact
Children whose mothers consumed fruit each day during pregnancy performed better on developmental testing at one year of age, according to the study published in the journal *EBioMedicine* in Spring 2016.
Research Highlights

Prenatal fruit consumption boosts babies’ cognitive development

New research using data from the CHILD Study suggests that children may reap the health benefits of fruit even before birth.

Children whose mothers consumed fruit each day during pregnancy performed better on developmental testing at one year of age, according to the study published in the journal *EBioMedicine* in Spring 2016.

AllerGen investigator Dr. Piush Mandhane, an associate professor of Pediatrics in the University of Alberta’s Faculty of Medicine & Dentistry, and Edmonton site leader of the CHILD Study, led the research.

“We wanted to know if we could identify prenatal and postnatal factors that affect cognitive development,” says Dr. Mandhane. “We found that one of the biggest predictors of cognitive development was how much fruit a mother consumed during pregnancy. The more fruit a mom had, the higher her child’s cognitive development.”

The study examined data from 688 children participating in the CHILD Study and controlled for factors that would normally affect a child’s learning and development, such as family income, parental education and the child’s gestational age.

Using a traditional IQ scale as a model, the study showed that if pregnant mothers consumed six or seven servings of fruit or fruit juice a day, on average their infants placed six or seven points higher on the scale at one year of age. “It’s quite a substantial difference—that’s half of a standard deviation,” Dr. Mandhane explains.

To further build on their findings, the researchers showed similar results in a laboratory test on fruit flies—the more fruit the flies ate before laying eggs, the better the offspring performed in specially adapted tests.

While these findings suggest the more fruit the better, the researchers caution that their study has not considered the potential complications of increasing natural sugar intake, such as gestational diabetes and high birthweight.

“Our future research will investigate whether the benefits of prenatal fruit consumption persist in children over time,” says Dr. Mandhane. “We also hope to determine if fruit can influence cognitive functions such as planning, organizing and working memory.”

Early childhood eczema linked to food allergies

AllerGen researchers have published the first study to link eczema in the first two years of life to common food allergies.

The research, published in the *International Archives of Allergy and Immunology* (April 2015) and featured in an issue of *Pediatric Chronicle*, concluded that eczema in the first two years of life was a risk factor for egg, peanut, tree nut and fish allergy—but not for allergies to milk and shellfish.

“It is likely that the impaired skin barrier seen in early childhood eczema allowed certain allergens to penetrate the skin, promoting allergic sensitization,” says AllerGen investigator Dr. Moshe Ben-Shoshan, a pediatric allergist at the Montreal Children’s Hospital, who was lead author on the paper. “This research supports the hypothesis that there is a critical age interval in which eczema increases the risk for many food allergies.”

The authors note that understanding the role of the skin barrier in relation to the development of food allergies is of particular interest, as it represents a potentially modifiable risk factor.
Understanding the relationship between air pollution and allergic respiratory disease

New research led by The University of British Columbia (UBC)-based lab of AllerGen investigator Dr. Christopher Carlsten has generated insight into how diesel exhaust (DE) and inhaled allergens can provoke molecular changes in the lung tissue of allergy-prone individuals.

In cross-Network collaborations with AllerGen investigators Dr. Scott Tebbutt (Associate Professor in the Department of Medicine at UBC) and Dr. Michael Kobor (Professor in the Department of Medical Genetics at UBC), Dr. Carlsten’s research brings us closer to understanding the role of air pollution in the development and progression of allergic respiratory disease, including asthma.

In April 2016, the Carlsten-Tebbutt labs published findings on the effects of DE and allergen co-exposures on inflammatory lung markers in *The Journal of Allergy and Clinical Immunology (JACI)*.

The study found that allergen exposure evoked significant changes in gene and miRNA profiles measurable at 48 hours, while the effects of DE were less pronounced. It also found that co-exposure appeared to induce unique effects,
though these were not seen when the data was subjected to a conservative statistical model. The researchers concluded that the changes they documented were “remarkable and novel,” given the stringent statistics applied and that previous studies tended to measure effects at 24 hours or earlier and focus on the upper (not lower) airway.

For a second *JACI* study published in May 2016, the Carlsten-Kobor labs explored the role of DNA methylation in the lung’s immune response to allergens and DE.

This study found that exposure to either allergen or DE alone, and co-exposure to both, resulted in modest DNA methylation within 48 hours. However, sequential exposures to first one and then, four weeks later, the other, produced a much greater effect. The researchers concluded that “specific exposures appear to prime the lung for changes in DNA methylation induced by a subsequent insult.”

These studies provide further evidence that air pollution and inhaled allergens have significant allergy-relevant effects on cell biology. These insights, in turn, may contribute to improved prevention strategies and treatments for allergic diseases, especially given that current therapies do not control well for exacerbating factors like air pollution.

**Artificially sweetened drinks during pregnancy increase infant BMI**

A study of over 3,000 Canadian mothers and their infants has shown that consumption of artificially sweetened beverages during pregnancy may place infants at an increased risk of obesity.

This breakthrough finding from AllerGen’s CHILD Study provides the first human evidence that exposure to artificial sweeteners *in utero* is associated with body mass index (BMI) in the first year of life and may contribute to the development of early childhood overweight.

“Animal research has suggested that consuming artificial sweeteners during pregnancy can pre-
dispose offspring to develop obesity, but to our knowledge, this has never been studied in humans," says lead author Dr. Meghan Azad, an assistant professor in pediatrics and child health, Max Rady College of Medicine, Rady Faculty of Health Sciences, University of Manitoba, and research scientist at the Children’s Hospital Research Institute of Manitoba.

“Given the current epidemic of childhood obesity and the widespread consumption of artificial sweeteners, we wanted to find out if a mother’s prenatal intake may be associated with her baby’s BMI,” adds Dr. Azad, who is an associate investigator of the CHILD Study. “CHILD provided us with an incredibly rich source of data to examine this important health issue.”

As part of the study, women completed dietary assessments in their second or third trimester of pregnancy and infant BMI was recorded during clinical assessments. Daily maternal consumption of artificially sweetened beverages was associated with a twofold higher risk of infant overweight.

The research was published in *JAMA Pediatrics* and involved CHILD Study investigators across four provinces at the University of Manitoba, the University of Alberta, The University of British Columbia, the University of Toronto and McMaster University.

Childhood obesity is a major public health challenge in Canada and obesity rates have doubled since the 1970s, with nearly one in three children now classified as overweight or obese, the authors note.

“While more research is warranted to confirm our findings and investigate the underlying biological mechanisms, we hope that this research will help to inform evidence-based dietary recommendations for pregnant women,” notes Dr. Azad.

**Understanding asthma control preferences of parents and teens**

Understanding the views of parents and children is critical to designing effective asthma management programs, yet these preferences are often not incorporated into clinical practice guidelines.

“Practice guidelines place equal weight on achieving various parameters of asthma control, but fail to reflect the fact that parents and children have
different preferences with regard to which parameters they feel are most important,” says Dr. Wendy Ungar, an AllerGen investigator and Senior Scientist in Child Health Evaluative Sciences at The Hospital for Sick Children.

To quantify these preferences, Dr. Ungar led an AllerGen-funded study that measured and compared the views of parents and teens on factors they perceived to be important in asthma control.

Fifty-two parents of children with asthma and 44 teens with asthma were surveyed regarding night-time symptoms; wheezing/chest tightening; changes in asthma medications; emergency room visits; and limitations in physical activity.

The study, published in *BMC Pulmonary Medicine* in November 2015, revealed that parents valued avoiding night-time asthma symptoms (most preferred) and disliked incurring 10 emergency room visits per year (least preferred).

Teens valued not having limitations on their physical activity (most preferred) and disliked having 10 physical activity limitations per month (least preferred).

“Asthma education and asthma management plans tend to use ‘one size fits all’ approaches that assume parents and children want exactly the same things with respect to asthma control,” says Dr. Ungar. “Our research pinpoints their different preferences, which we hope will help to inform the design of more effective, tailored clinical practice guidelines and asthma education programs.”
In 2015-2016, several Network trainees undertook research visits to international partners, fostering global research collaboration, knowledge exchange, and networking.
Network Partners, Collaborators and Knowledge Users

As Canada’s allergic disease research network, AllerGen links researchers, students, industry and community partners, and other organizations across academia, industry, not-for-profit and government sectors.

Partners play a vital role in shaping and enhancing AllerGen’s research outcomes, and in translating and commercializing key findings for the benefit of Canadians with allergic diseases.

In 2015-2016, AllerGen worked with 125 partners, engaging an average of four partners per research project.

2015-2016 Partners List (n=125)

Universities (n=26)
(17 Canadian, 9 International)
- Changzhou University
- Charité Universitätsmedizin Berlin
- Dalhousie University
- Harvard University
- Karolinska Institute
- Lakehead University
- McGill University
- McMaster University
- Queen’s University
- Simon Fraser University
- Stanford University
- The University of British Columbia
- The University of Newcastle
- The University of Western Australia
- Université de Montréal
- Université du Québec à Chicoutimi
- Université Laval
- University of Alberta
- University of Calgary
- University of Manitoba
- University of Nebraska
- University of Ottawa
- University of Queensland
- University of Saskatchewan
- University of Toronto
- University of Waterloo

Hospitals and Health Centres (n=9)
- Centre for Heart and Lung Innovation
- Centre Hospitalier universitaire (CHU) Sainte-Justine
- Hôpital du Sacré-Cœur de Montréal
- Institut universitaire de cardiology et de pneumologie de Québec (IUCPQ)
- Kingston General Hospital
- St. Joseph’s Healthcare Hamilton
- St. Michael’s Hospital
- The Hospital for Sick Children
- The McGill University Health Centre

Industry (n=34)
(28 Canadian, 6 International)
- Adiga Life Sciences Inc.
- Allergic Living
- AstraZeneca Canada Inc.
- AUG Signals
- Carr-Gordon Limited
- Chenomx Inc.
- CTI Life Sciences Fund
- David Brener & Associates Inc.
- Deborah Danoff Consulting
- Fluidigm Corporation
- GlaxoSmithKline
- Greenfleet Ltd.
- Kanata Allergy Services Ltd.
- Kincora Innovation
- Knopp Biosciences
- Lincoln Diagnostics Inc./ALK
- Lumira Capital
- McDonald’s Restaurants of Canada Limited
- NanoString Technologies
Novartis Pharmaceuticals Canada Inc.
PerkinElmer Inc.
Pfizer Canada Inc.
Pro-Bio Associates
Roche Canada
Sanofi Pasteur Limited
Shoppers Drug Mart Corporation
Sylviane Duval Consulting
Takeda Canada Inc.
TEC Edmonton
Teva Pharmaceutical Industries Ltd.
Trudell Medical International
TVM Capital
Vedanta BioSciences
Westmed, Inc.

**Federal Agencies (n=5)**
Canadian Foundation for Innovation
Canadian Institutes of Health Research
Environment and Climate Change Canada
Health Canada - Clean Air Regulatory Agenda
Health Canada - Food Directorate

**Provincial Agencies (n=8)**
Fonds de recherche du Québec
Healthy Child Manitoba
Healthy Child Manitoba - Families First
Michael Smith Foundation for Health Research
Ontario-China Research and Innovation Fund
Ontario Ministry of Health and Long-Term Care
Ontario Ministry of Labour
Public Health Ontario

**Non-Profit, Networks and Professional Associations (n=34)**
Allergies Québec (AQ)
Allergy/Asthma Information Association (AAIA)
American Academy of Allergy, Asthma & Immunology (AAAAI)
Asthma Society of Canada
British Columbia Lung Association
Canadian Allergy, Asthma and Immunology Foundation (CAAIF)
Canadian Anaphylaxis Initiative
Canadian Lung Association/Canadian Thoracic Society (National Office)
Canadian Respiratory Research Network
Canadian Society of Allergy and Clinical Immunology (CSACI)
Centre for Drug Research and Development (CDRD)
Centre of Excellence for Prevention of Organ Failure (PROOF)
Childhood Asthma Foundation
City of Hamilton
Compute Canada
DeGroote Family - William J. Walsh Professorship in Medicine
Dietetians of Canada
Food Allergy Canada
JP Bickell Foundation
Fondation Fast/Fast Foundation
M. Alex Harvey
Manitoba Medical Services Foundation
Markin USRP Summer Studentship
Mitacs
NeuroDevNet
Ontario Centres of Excellence
Palix Foundation
Réseau Québécois de l’asthme et de la MPOC
Saskatchewan Health Research Foundation
St. Joseph’s Healthcare Foundation
SickKids Foundation
Stem Cell Network
The Sandbox Project
University Health Network (UHN)

**Research Institutes (n=9)**
Alberta Children’s Hospital Research Institute
Biomedical Research Centre
Centre for Blood Research (UBC)
Children’s Hospital Research Institute of Manitoba
Farncombe Family Digestive Health Research Institute
Helmholtz Zentrum München
Munich Allergy Research Center (MARC)
Southern Ontario Centre for Atmospheric Aerosol Research
Women and Children’s Health Research Institute
International Partnerships

Through strategic international partnerships and collaborations, AllerGen provides innovative training and skill acquisition opportunities for the Network’s students, new professionals and research staff.

The International Trainee Research Visit Program funds selected AllerGen trainees to spend up to six months outside of Canada working on research projects with international investigators and research teams.

In 2015-2016, several Network trainees undertook research visits to international partners, fostering global research collaboration, knowledge exchange, and networking.

Studying second-hand smoke and food allergy in Sweden

Laura Feldman spent four months with AllerGen partner organization the Karolinska Institute in Stockholm, Sweden, investigating the effects of early-life exposure to second-hand smoke on the development of food allergy symptoms among children in a population-based Swedish birth cohort. Ms. Feldman, a Masters of Public Health (Epidemiology) candidate at the University of Toronto’s Dalla Lana School of Public Health, was supervised by Dr. Anna Bergström and by Dr. Jennifer Protudjer, a postdoctoral fellow and former AllerGen trainee.

“As a result of this once-in-a-lifetime opportunity, I have been able to meaningfully contribute to the scientific literature on the impact of environmental exposures on allergic disease outcomes. On a personal level, I have experienced immense growth as an epidemiologist-in-training, and have built valuable personal and professional relationships.”

Laura Feldman, MPH(c), University of Toronto

Building ties in Belgium

Matthew Gold, a PhD candidate in Experimental Medicine at The University of British Columbia, spent nine weeks in the laboratory of Dr. Bart Lambrecht at the Vlaams Instituut voor Biotechnologie (VIB) Inflammation Research Centre of the University of Ghent, in Ghent, Belgium. During his research visit, Mr. Gold honed his expertise in the influence of dendritic cells on type 2 helper (Th2) cells—cells which appear to play a triggering role in certain allergy-related immune responses.

“While working alongside a global pioneer at Harvard

Dr. Michelle North, a postdoctoral fellow in the department of Biomedical and Molecular Sciences at Queen’s University, spent the summer of 2015 at the Harvard T.H. Chan School of Public Health in Cambridge, MA. Under the supervision of Dr. Andrea Baccarelli, she analyzed the mitochondrial DNA
of children participating in The Kingston Allergy Birth Cohort—part of her research on the early-life origins of allergic disease.

**Legacy Partnerships**

One in three Canadians is affected by allergic disease; nearly three million Canadians suffer from asthma; approximately 21,000 Canadians die each year due to air pollution; and 7.5% of the population self-report a food allergy.

In 2015-16, AllerGen strengthened its partnerships with organizations critical to AllerGen’s research and HQP training mandate to 2019 and beyond.

**Legacy funding for AllerGen’s Clinician-Scientist Fellowship post-2019**

A legacy partnership with the Canadian Allergy, Asthma and Immunology Foundation (CAAIF) will ensure that AllerGen’s flagship Emerging Clinician-Scientist Fellowship award continues to support Canadian innovation and capacity building for years to come.

AllerGen has awarded three Emerging Clinician-Scientist Fellowships since 2011. Valued at $250,000 each, these awards have enabled newly trained Canadian allergists and immunologists to advance their research expertise and pursue a combined career as clinicians and academic researchers.

In March 2016, the AllerGen Board of Directors announced that CAAIF will provide legacy funding to support this award from 2019-2022, and potentially in perpetuity, after the completion of AllerGen’s NCE mandate in 2019.

“AllerGen has recognized that the need for more clinician-scientists in the field of allergy and clinical immunology is a persistent challenge that will extend beyond the life of AllerGen as an NCE,” said Dr. Howard Bergman, AllerGen’s Chairman of the Board. “We are thankful for CAAIF’s partnership to extend the reach of this important award, which aims to address the shortage of clinician-scientists in allergy and clinical immunology.”

“Clinician-scientists are uniquely positioned to make a major contribution to the translation of research knowledge into improved patient care and health,” adds CAAIF President, Dr. Susan Waserman. “CAAIF is thrilled to partner with AllerGen on this award, and to carry on the legacy they have established into the years beyond NCE support.”

Previous recipients of the Emerging Clinician-Scientist Fellowship have made significant contributions to the field of allergic disease. Dr. Moshe Ben-Shoshan (2011, McGill University) has established a Canadian database of anaphylaxis cases, tracking the rate, triggers and management of anaphylaxis across provinces and healthcare settings.

Dr. Phillipe Bégin (2013, Centre hospitalier universitaire Sainte-Justine) trained at Stanford University...
in the Stanford Alliance for Food Allergy Research (SAFAR) clinical research centre under Dr. Kari Nadeau, where he advanced the development of cost-effective approaches to oral immunotherapy for food allergies.

Dr. Marylin Desjardins (2014, Research Institute at McGill University Health Centre; Montreal Children’s Hospital) is studying interleukin-21 (IL-21), a protein that plays a key role in stimulating the body’s immune system and antibody production. A better understanding of how IL-21 works and the role it plays in the development of autoimmune diseases and inflammatory disorders could contribute to new treatment options for individuals with allergies, asthma and immune deficiencies.

The joint award will be re-named the AllerGen–CAAIF Emerging Clinician-Scientist Fellowship.

**Cross-network partnership with CRRN deepens**

In 2015-16, AllerGen and the Canadian Respiratory Research Network (CRRN) further strengthened their strategic partnership in areas critical to their mandates, including supporting new investigators, training and integrating Highly Qualified Personnel, and fostering cross-network collaboration. The two organizations were actively engaged at all levels, from senior network management to the student grassroots.

AllerGen’s Managing Director, Dr. Diana Royce, attended the CRRN’s Annual General Meeting in January 2016, where she spoke about how to build and sustain a well-functioning network of expertise, and the importance of sharing expertise across Networks.

“Together, AllerGen and CRRN aim to improve patient care and outcomes for Canadians with chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease,” said Dr. Royce, following the two-day meeting. “Our joint vision for cross-Network collaboration through research conferences, meetings, workshops, symposia and capacity-building programs will ensure research momentum, and will extend and continue the skill development opportunities that AllerGen has provided its trainees since 2005.”

In April 2016, AllerGen funded four of its trainees and its Manager of Highly Qualified Personnel Training Program and Events, Michelle Harkness, to attend the 2nd Annual CRRN/RENASCENT Training Workshop in Halifax, NS. The workshop
will study the hypothesis that lying down during sleep causes fluid to move out of the legs and into the chest, where it swells the airway wall, thus narrowing the airway and worsening asthma symptoms overnight.

**CAAIF and AllerGen boost innovative research**

Two Research Fellowships, co-funded in 2015-16 by the Canadian Allergy, Asthma and Immunology Foundation (CAAIF) and AllerGen, are supporting the innovative research of exceptional young scientists in the field of clinical immunology and allergy.

In 2016, CAAIF-AllerGen Research Fellowships were awarded to Dr. Catherine Biggs (The University of British Columbia) and Dr. Nicholas Jendzjowsky (University of Calgary), providing funds to support their salaries and a research allowance towards research-related expenses, including travel to national and international scientific meetings.

Dr. Biggs (MD) attended medical school at The University of British Columbia (UBC) and completed her sub-specialty training in allergy and clinical immunology at Harvard Medical School/Boston Children’s Hospital.
The Fellowship will allow Dr. Biggs to work with AllerGen investigator and pediatric immunologist Dr. Stuart Turvey (UBC) to study eosinophils, a type of white blood cell. Her research will examine a rare mutation in the Janus kinase 1 (JAK1) gene, which leads to high eosinophil levels and organ system inflammation. Working with a Canadian family comprising the only people known to have a heritable form of the JAK1 mutation, Dr. Biggs will characterize the functional impact that this genetic defect has on the immune system. Her research will generate new knowledge on the mechanisms behind eosinophil survival and will have therapeutic implications not only for rare disorders such as JAK1, but also for common allergic diseases.

With support from the CAAIF-AllerGen Research Fellowship, Dr. Jendzjowsky (PhD) will work with Dr. Richard Wilson at the University of Calgary to study the origins of asthma in the central nervous system and neural interactions with lung inflammation. His research will enhance our understanding of the origins of asthmatic disease and will potentially provide a platform to test new drug therapies, which may benefit patients with asthma and inflammatory lung disease.
A “food free” pilot program informed by AllerGen research helped an Ontario library become a more welcoming space for everyone.
In 2015-16, AllerGen published high-impact research findings that captured the attention of the scientific and clinical communities, government, industry and the general public. AllerGen’s knowledge mobilization and commercialization activities accelerated the uptake and application of these results both within and beyond the Network to partner organizations, stakeholders and receptor communities across the country.

Knowledge Mobilization

**AllerGen Success Stories**

AllerGen’s *Success Stories* is written for Canadian families and healthcare providers, providing up-to-date information on cutting-edge research into asthma, allergies and anaphylaxis and exploring what causes these illnesses, how better to manage, treat and prevent them, and steps towards finding cures.

AllerGen has published and distributed nine issues of *Success Stories* to over 1,200 Network participants, partners and knowledge users since 2010.

In addition to diverse topics in the areas of asthma and allergies, *Success Stories*, available in English and French, features the accomplishments of AllerGen’s Highly Qualified Personnel.

**AllerGen’s food allergy research drives library’s policy change**

Keeping toddlers and preschoolers with food allergies safe in the busy children’s spaces of a public library can be daunting. But the success of a 2016 “food free” pilot program— informed by AllerGen’s Canadian Food Allergy Strategic Team’s (CanFAST) food allergy research—has helped a Markham, Ontario library become a more welcoming space for everyone.

Markham parents Dr. Jyoti Parmar and Mr. Peter Deboran used to make regular family outings to their local library branch. But when two of their three young children developed food allergies, they began restricting their visits.

“Parents and caregivers feed children while they are playing in the kids’ book sections and story-time areas,” says Parmar. “Food drops on the
area; and 17% had no preference. Further, 83% reported that their satisfaction with the library had increased; 82% felt that the children’s area was cleaner; and 68% felt safer when bringing their children to the library.

As a result of the pilot’s success, the Food and Drink Policy for the Markham Public Library was amended, and all city branches will adopt the no-food zone policy in children’s areas.

“We are excited that we can enjoy the library again as a family,” says Parmar. “AllerGen’s research on the prevalence and impact of food allergies helped us to achieve this important change in our community, which will create a safer and more inclusive environment for Markham citizens.”

Citing AllerGen CanFAST prevalence data that revealed 7.5% of the population, or one in 13 Canadians, has a food allergy (Soller et al., 2015), the couple made a formal presentation to the Library Board in November 2015, to share their experiences and to propose a food and beverage restriction in the children’s spaces of the library.

Following a Board-approved four-month pilot project to evaluate the effectiveness and impact of a no-food zone in the children’s area, the findings were presented in May 2016. In a customer satisfaction survey: 64% of patrons felt that the no-food zone was beneficial; 19% maintained that the library should allow food in the children’s area; and 17% had no preference. Further, 83% reported that their satisfaction with the library had increased; 82% felt that the children’s area was cleaner; and 68% felt safer when bringing their children to the library.

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Award-winning video features CHILD Study
AllerGen’s CHILD Study video received first place and a $5,000 prize in a 2015 competition run by the CIHR-Institute for Human Development, Child and Youth Health.

The “IHDCYH Talks” competition recognizes excellence in videos that present evidence-based research to a lay audience and incorporate a
message designed to have a positive impact on the health of children, youth and families.

The CHILD Study video scored an average of 4.45 out of 5.0 on criteria ranging from: impact and relevance; accessibility; innovation and creativity; video quality and reach. It received 2,900 views on the CIHR website and the highest number of online public votes among all 13 entrants.

Since July 2015, the video has registered nearly 7,000 views in 88 countries.

**AllerGen research on the move**

Each year, AllerGen participates in high-impact workshops and events with partners across the country to mobilize the Network’s allergic disease research and knowledge to those who can put it into practice.

In May 2015, AllerGen partnered with Food Allergy Canada at its 8th Annual Conference held in Toronto, Ontario, featuring the theme “Unlocking the mysteries of food allergy: what can we learn from research?” The event informed patients, caregivers, educators, and healthcare professionals about trends in food allergy research and food labelling initiatives, emphasizing their relevance to the allergy community.

Approximately 300 delegates, including members of the general public, and pharmaceutical and food industry representatives, attended the conference. The full-day program featured presentations and discussions with leading experts in food allergy research, food science, and food labelling and risk assessment, as well as a dynamic youth panel where teens and young adults talked about their experiences living with food allergies.

As Food Allergy Canada’s primary research partner, AllerGen provided expert speakers, sponsorship, a booth display and resource materials to share its body of food allergy and anaphylaxis research with the general public and policymakers. AllerGen’s
Food-allergic students face stigma in Ontario schools

Has Sabrina’s Law impacted the lives of food-allergic students?

A 2015 paper by AllerGen researchers examined this question. It is the first study of its kind to explore the social implications of Sabrina’s Law—the legislation requiring Ontario schools to establish an anaphylaxis policy and individual action plans for each allergic student.

Sara Shannon—mother of Sabrina Shannon, who died at 13 years of age in 2003 from an anaphylactic reaction at school, and after whom the legislation is named—co-authored the paper with AllerGen investigators Drs Susan Elliott (University of Waterloo) and Ann Clarke (University of Calgary), and collaborators Drs Nancy Fenton and Jennifer Dean (University of Waterloo).

The researchers interviewed 20 children at risk for anaphylaxis and their parents two years after Sabrina’s Law was enacted. While the legislation was intended to create a safe environment for allergic youth, the in-depth interviews revealed that 75% of students and their parents also reported negative implications resulting from the process of disclosing their health status.

“Certain practices and policies implemented under Sabrina’s Law to ensure safety, such as removing allergic students from the classroom and posting photos of allergic students, resulted in some children feeling stigmatized,” explains Dr. Jennifer Dean, an assistant professor at the University of Waterloo and the paper’s first author. “On a social
level, the disclosure process did subject some allergic youth to stigmatization and isolation, and this affected some students more than others.”

Stigma was categorized as either "enacted," through overt discrimination and bullying by classmates, or “felt,” where the student internalized feelings of shame, fear or worry about future discrimination.

On the other hand, the study credited Sabrina’s Law with contributing to the cultural shift in awareness of food allergies, which has had beneficial effects for the allergic population.

“Questions were raised at the time that Sabrina’s Law was introduced regarding the potential of it doing more harm than good,” comments Dr. Susan Elliott, an AllerGen Research Leader and a professor of Geography and Environmental Management at the University of Waterloo. “Our findings have shown that Sabrina’s Law is an important tool to promote education and awareness in schools, but we need to be mindful about how we operationalize the legislation so we can balance protecting the physical safety of food-allergic children with their social well-being.”

The paper was published in *Health and Social Care in the Community* in May 2015.
Commercialization
Peer power: Helping kids with asthma to help each other

Children living with asthma and allergies need all the support they can get. For over 40 years, the Asthma Society of Canada (ASC), an AllerGen legacy partner, has provided expert advice and support to adults and children affected by asthma—and now the organization will do even more to let Canadian kids know they are not alone.

In February 2016, the ASC signed a non-exclusive, non-revenue generating licensing agreement with AllerGen and the University of Alberta (TEC Edmonton) to adapt and offer to the public a unique peer mentoring program developed by AllerGen investigator Dr. Miriam Stewart.

“Children face many challenges managing their asthma and the stigma associated with having a chronic condition,” says Vanessa Foran, President & CEO of the ASC. “This agreement allows us to offer a free online program that will empower kids to develop greater confidence and better communication skills, and help them live an active, symptom-free life by connecting them with other children and peer mentors who have faced similar experiences.”

Program materials were designed by an interdisciplinary team led by Dr. Stewart, a professor of nursing at the University of Alberta, with research funding provided by AllerGen. From 2011 to 2013, these resources were refined and pilot-tested with community partner organizations through grants from AllerGen and Alberta Innovates-Health Solutions.

In 2014, Food Allergy Canada (FAC), another AllerGen legacy partner, first licensed and adapted these resources, launching Allergy Pals (for youth aged 7-11 years), followed in 2015 by Allergy Allies (12-15 years)—customized peer-support programs for children and teens affected by severe food allergies. Since 2014, over 300 Canadian children have been mentored online, sessions have reached maximum capacity, and 100% of parents report that they would recommend the program to others.
AllerGen facilitated the development of the agreements with both ASC and FAC through the Network’s commercialization program, which assists Network researchers to find and secure knowledge mobilization and commercialization opportunities for their research outcomes.

“Kids with asthma and allergies can face social isolation and miss out on activities with their peers,” says Dr. Stewart. “We are delighted that the ASC will offer this accessible, appealing program designed to connect these kids with their peers and with peer mentors, because living with allergies and asthma is a lot easier when you know you’re not alone.”

**Commercialization webinars draw viewers beyond Network**

“Don’t let the fact that you know nothing about business inhibit you from starting a business,” advised scientist-entrepreneur Dr. Pieter Cullis on March 10, 2016, as he spoke about launching business ventures based on research results to members of the AllerGen Network and other interested stakeholders.

Dr. Cullis was one of a stellar slate of business and innovation specialists featured in AllerGen’s “Planning for Research Success” webinar series, delivered to researchers, students, community partners and other NCEs in Fall 2015 and Winter 2016. The speakers offered expert insights, from what to cover in a value proposition, to how to gain traction with an industry partner and who to include in a start-up team.

The five-part professional development series was designed to impart skills and know-how to help researchers maximize the sustainability and impact of their research.
For members of the AllerGen ASNPN Executive Committee, honing their governance and leadership skills is a built-in perk.
Tomorrow’s Leaders: AllerGen’s Highly Qualified Personnel (HQP)

“Working with the CHILD Study and leading a research project from start to finish has been a transformative experience that has greatly accelerated my career development.”

Maxwell Tran, AllerGen HQP
3rd year Bachelor of Health Sciences, McMaster University

For more than a decade, AllerGen has been committed to attracting, developing, and retaining outstanding Highly Qualified Personnel (HQP) in Canada. Annually, AllerGen invests $500,000 in capacity-building programs that enhance the training, education, and personal and professional development of students, research staff and new professionals.

These programs foster the development of talented and innovative people who are becoming leaders in allergic disease across Canadian campuses, companies and communities.

In 2015-2016, 318 HQP were involved in the AllerGen network: 263 actively working on AllerGen research projects, and 55 working on related research.

From classroom to boardroom: ASNPN Executive members gain governance experience

For many Canadian students and new professionals, finding opportunities to acquire governance experience and executive leadership skills can be a challenge.

But for the members of the AllerGen Students and New Professionals Network (ASNPN) Executive Committee, honing these skills is a built-in perk.

“Serving on the ASNPN Executive, I have developed a variety of practical and transferrable skills, such as how to chair a high-level meeting; critically review corporate documents like minutes, agendas and executive reports; and lead others in effective decision-making,” says Amrit Singh (PhD [c]), The University of British Columbia, the 2015-2016 ASNPN President.

Since 2005:

- 211 employed HQP graduates; 32% working in industry or private sector
- 54 graduates in faculty positions (42 Canadian; 12 International)
- 50% of AllerGen’s peer-reviewed publications have a trainee as first author
- 443 trainee participants in Annual Trainee Symposium
- 40 recipients of Summer Studentship award
- 3 clinician-scientist careers launched
Launched in 2007, the ASNPN is a student-led organization open to trainees (undergraduate students to postdoctoral fellows), research staff and early career researchers working in the field of allergic disease in Canada. The 10-member Executive Committee—elected annually by the ASNPN membership—works to enhance research and professional networking opportunities for Allergen research trainees, research staff and new professionals. The committee, which meets five-times per year by teleconference, acts in an advisory capacity to the Allergen Advanced Education and Training Opportunities Advisory Committee (AETOAC), which, in turn, provides strategic advice on HQP programming and investments to the Allergen Research Management Committee (RMC).

As ASNPN Vice-President, Laura Feldman (MPH [c]), University of Toronto) sits as an observer on Allergen’s RMC. “Representing Allergen trainees on the RMC has been an unbelievable learning experience,” says Feldman. “I have had the opportunity to review and comment on proposed new Allergen research projects, and to participate in discussions with Canada’s top scientists and clinicians about Network investments, which has given me valuable insight into the grant review process.”

Singh plays a similar role on Allergen’s Board of Directors. “Working alongside senior Network executives, all with extensive industry, government or academic experience, has helped me understand the organizational dynamics, priorities and responsibilities of a board of directors,” he says. “I don’t know many other students who have had the same opportunities I have as part of the ASNPN Executive.”

### Allergen HQP by level of study or career status (2015-2016)

<table>
<thead>
<tr>
<th>Category</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduates</td>
<td>34 (10.6%)</td>
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<tr>
<td>Masters</td>
<td>42 (13.2%)</td>
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<tr>
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<td>49 (15.4%)</td>
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<tr>
<td>MD</td>
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<tr>
<td>PD</td>
<td>36 (11.3%)</td>
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<tr>
<td>Fellow-in-Training</td>
<td>9 (2.8%)</td>
</tr>
<tr>
<td>Other—Early career</td>
<td>4 (1.3%)</td>
</tr>
<tr>
<td>Other—Research staff</td>
<td>139 (43.7%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>318</strong></td>
</tr>
</tbody>
</table>
AllerGen HQP. I learned that I am a ‘green’ temperament with strengths to think strategically, and to recognize and solve problems,” says Dr. Chris Rider, a postdoctoral fellow at The University of British Columbia.

The workshop was one of five unique skill-development sessions offered at the 2015 Trainee Symposium, held in Toronto, ON, from April 29 to May 1, with the theme of “careers outside academia.”

Other sessions included The Business Side of Science, Success After Graduate School, Social Media & Communicating Your Science, and a special presentation by Dr. Jane Aubin, Chief Scientific Officer and Vice-President, Research, Knowledge Translation and Ethics Portfolio, at the Canadian Institutes of Health Research.

A career panel, moderated by former AllerGen trainee Dr. Marie-Josée Martel (Director of Scientific Client Strategies, Xcenda L.C.C.) and featuring representatives from the Ontario Genomics Institute, Public Health Ontario and the Parkdale Community Health Centre, was another event highlight.

Delegates also had the opportunity to pose for a professional corporate photo and to record a video testimonial about the impact of AllerGen’s HQP training program on their career development and research expertise. Following the conference, the video testimonials were incorporated into AllerGen’s NCE Mid-term Review application and are featured on AllerGen’s YouTube channel.

AllerGen’s Trainee Symposium provides Network trainees and ASNPN members with value-added professional development to complement their academic and scientific training.

“I look forward to the Trainee Symposium every year,” adds AllerGen HQP Stephanie Nairn, a PhD candidate in Sociology & Social Studies of Medicine at McGill University. “In addition to the exceptional workshops, I have found the opportunity to network with researchers across disciplines, as well as the professional development advice provided by former AllerGen trainees, to be invaluable during my development as a doctoral candidate.”

Standing out from the crowd with Research Skills Awards

AllerGen HQP seeking to develop specialized technical and laboratory skills need look no further than AllerGen’s Research Skills Awards program. Since 2011, the program has funded 24 individual HQP training experiences, including participation in scientific courses and workshops, specialized

“The Flow Cytometry Workshop was an excellent career development opportunity that has helped me become a more competent and efficient researcher. I received hands-on training in the latest technologies for flow cytometry and cell sorting, which has diversified my research skill set and improved my practical lab skills.”

Ali Hosseini, M.Sc.(c)
The University of British Columbia
Supervisor: Dr. Chris Carlsten
The goal, according to Michelle Harkness, AllerGen’s HQP Training and Events Coordinator, is to help students develop competencies that support their training and enhance their future employability.

In 2015-2016, AllerGen disbursed eight Research Skills Awards to trainees based at Université Laval, The University of British Columbia and McMaster University to help them develop their capacities in questionnaire validation, data sequencing, bioinformatics and flow cytometry.
Travel awards promote personal and professional growth

AllerGen Travel Awards assist Network investigators and HQP to travel to prestigious national and international meetings and conferences to present their work, network and learn. AllerGen Travel Awards are highly sought after, and to date more than 263 awards have allowed HQP to share their allergic disease research with audiences around the globe. Awards, valued up to $1,200, are matched 1:1 with non-AllerGen partner funding.

“Travel awards support the acquisition of educational experiences that enrich not only our students, but the AllerGen network as a whole,” says AllerGen’s Managing Director, Dr. Diana Royce.

“In 2015-16, AllerGen granted 44 awards, supporting attendance at three national and 12 international events—we are delighted with the impact our HQP are having on the global stage.”

Summer Studentships offer taste of clinician-scientist career

In 2015, Jasmine Cheng and nine other Canadian university undergraduates were awarded AllerGen Summer Studentships—facilitating unique opportunities to work with AllerGen research teams conducting innovative allergic disease research.

“My ultimate career goal is to become a clinician-scientist,” says Cheng, a third-year student at The University of British Columbia. “The AllerGen studentship allowed me to work in a lab that specializes in bench-to-bedside research and to observe what a clinician-scientist’s job entails.”

Leah Stiemsma, PhD(c)
The University of British Columbia
Supervisor: Dr. Stuart Turvey

“Through the AllerGen Travel Awards program, I presented my work on the nasal allergen challenge technique utilized by the Allergic Rhinitis–Clinical Investigator Collaborative at both the European Academy of Allergy and Clinical Immunology Congress in Barcelona, and the American Academy of Allergy, Asthma and Immunology Annual Meeting in Los Angeles. Discussing my research with clinician-scientists and medical affairs directors from pharmaceutical companies was a great way for me to acquire different perspectives, and, in turn, to pique the interest of potential industry partners in my research.”

Mena Soliman, M.Sc.(c)
Queen’s University
Supervisor: Dr. Anne Ellis

“I attended the European Respiratory Society (ERS) International Congress in Amsterdam to present my work characterizing the early-life microbiota in children diagnosed with asthma. This opportunity was extremely beneficial to my growth as a young scientist: I gained valuable experience interacting with other trainees and scientists, and I developed confidence in presenting my research to a large, international audience.”

Leah Stiemsma, PhD(c)
The University of British Columbia
Supervisor: Dr. Stuart Turvey

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AllerGen Summer Studentships aim to foster an early interest in allergic and related immune disease research, potentially leading to a career in research or clinical practice—or both. Since 2012, 40 trainees have participated in the program, which allows students to work full-time on a summer research project under the supervision of an AllerGen investigator.

AllerGen NCE Inc.
### AllerGen 2015-16 Undergraduate Summer Studentship Recipients

<table>
<thead>
<tr>
<th>Institution/Recipient</th>
<th>Partnered Award Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>McGill University, Michael Chen</td>
<td>“Oxidative stress mediates organic dust-induced airway hyper-responsiveness and airway remodeling.” $6,000</td>
</tr>
<tr>
<td>McMaster University, Raymond Chen</td>
<td>“The effects of a single nucleotide polymorphism rs18372353 on nasal epithelial-derived thymic stromal lymphopoietin and peripheral blood CD34+ cell eosinophil/basophil lineage commitment.” $6,000</td>
</tr>
<tr>
<td>McMaster University, Maxwell Tran</td>
<td>“Child diet in relation to persistent food sensitization at 3 years in a Canadian Longitudinal Birth Cohort Study.” $6,000</td>
</tr>
<tr>
<td>McMaster University, Mark Tenn</td>
<td>“Peptide immunotherapy for prevention of peanut sensitization in a murine model.” $6,000</td>
</tr>
<tr>
<td>McMaster University, Keith Tam</td>
<td>“Prenatal and early-life determinants for 1-year infant allergy and atopic diseases in a multi-ethnic prospective birth cohort.” $6,000</td>
</tr>
<tr>
<td>The University of British Columbia, Jasmine Cheng</td>
<td>“The impact of the intestinal microbiota on human immune development and atopic disease.” $6,000</td>
</tr>
<tr>
<td>The University of British Columbia, Eric Lu</td>
<td>“Elucidation of smoothelin function in airway smooth muscle.” $6,000</td>
</tr>
<tr>
<td>Université du Québec à Chicoutimi, Anne-Marie Boucher-Lafleur</td>
<td>“Protein quantification of interleukin 1 family members in whole blood samples and bronchial epithelial cells in asthma.” $6,000</td>
</tr>
<tr>
<td>Miriam Larouche</td>
<td>“Methylation study of selected genes involved in the inflammatory process in asthma.” $6,000</td>
</tr>
<tr>
<td>University of Manitoba, Deborah Chan</td>
<td>“Intrapartum antibiotic use and breastfeeding success in the Canadian Healthy Infant Longitudinal Development (CHILD) Study.” $6,000</td>
</tr>
</tbody>
</table>

**2015-2016 Award Value** $60,000
Fellow 2015 Summer Studentships recipients Michael Chen (McGill University) and Mark Tenn (McMaster University) echo Cheng on the benefits of being part of a cutting-edge AllerGen research team. Working with Dr. James Martin at McGill University “fueled my interest in pursuing a career as a clinician-scientist, and gave me the chance to participate in and learn more about translational science research,” says Chen.

“The AllerGen studentship has strengthened my desire to become a clinician-scientist, so that I can interact with patients and translate clinical observations to biomedical research solutions,” Cheng adds.

For Cheng, working alongside Dr. Stuart Turvey at The Child & Family Research Institute in Vancouver, BC, was a remarkable experience. As a member of his team analyzing data from the CHILD Study, Cheng contributed to the breakthrough finding in September 2015, that infants at high risk of developing asthma had low levels of four gut bacteria in the first three months of life.

“The AllerGen studentship has strengthened my desire to become a clinician-scientist, so that I can interact with patients and translate clinical observations to biomedical research solutions,” Cheng adds.

Since 2012, AllerGen has invested over $120,000 in the program. For each student, AllerGen provides up to $3,000 in support, matched 1:1 by Canadian partner organizations for an annual program value of $60,000.

Trainees present their research to Canada’s top clinicians

For the third consecutive year, AllerGen partnered with the Canadian Society of Allergy and Clinical Immunology (CSACI) to host AllerGen’s Annual HQP Poster Competition. The event was held in conjunction with the CSACI’s 70th Annual Scientific Meeting in Vancouver, BC, from October 21-24, 2015.

Each year, the poster competition offers trainees a venue in which to showcase their research and receive formative feedback from prominent Canadian allergists, clinical immunologists, researchers and clinician-scientists.

“Attending the CSACI Scientific Meeting is highly beneficial for junior scientists,” says Dr. Damian Tworek (MD/PhD), a postdoctoral fellow at McMaster University. “The meeting provides an excellent opportunity for us to network with clinician-scientists and form multidisciplinary collaborations.”
### 2015 AllerGen Poster Competition Winners

<table>
<thead>
<tr>
<th>Name</th>
<th>Place</th>
<th>Category</th>
<th>Institution</th>
<th>Supervisor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephanie Legere</td>
<td>1st</td>
<td>Undergrad</td>
<td>Dalhousie University</td>
<td>Jean Marshall</td>
<td>IL-33 induces cytokine and chemokine production in human mast cells</td>
</tr>
<tr>
<td>Anne-Marie Boucher-Lafleur</td>
<td>2nd</td>
<td>Undergrad</td>
<td>L’université du Québec à Chicoutimi</td>
<td>Catherine Laprise</td>
<td>IL33 DNA methylation in bronchial epithelial cells is associated with asthma</td>
</tr>
<tr>
<td>Mena Soliman</td>
<td>1st</td>
<td>Masters</td>
<td>Queen’s University</td>
<td>Anne Ellis</td>
<td>Mapping local inflammatory cytokine secretion following a cumulative allergen dose using the Allergic Rhinitis Clinical Investigator Collaborative Nasal Allergen Challenge model</td>
</tr>
<tr>
<td>Laura Feldman</td>
<td>2nd</td>
<td>Masters</td>
<td>The Hospital for Sick Children</td>
<td>Teresa To</td>
<td>Secondhand tobacco smoke exposure in infancy and the development of food hypersensitivity from childhood to adolescence</td>
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<tr>
<td>Young Woong Kim</td>
<td>1st</td>
<td>PhD</td>
<td>The University of British Columbia</td>
<td>Scott Tebbutt</td>
<td>Systemic immune pathways associated with the mechanisms of Cat-Synthetic Peptide Immuno-Regulatory Epitopes, a novel immuno-therapy, in whole blood of cat-allergic people</td>
</tr>
<tr>
<td>Amrit Singh</td>
<td>2nd</td>
<td>PhD</td>
<td>The University of British Columbia</td>
<td>Scott Tebbutt</td>
<td>Multi-omic blood biomarker signatures of the late phase asthmatic response</td>
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<tr>
<td>Elinor Simons</td>
<td>1st</td>
<td>Open</td>
<td>University of Manitoba</td>
<td>N/A</td>
<td>Age of peanut introduction and development of reactions and sensitization to peanut</td>
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<tr>
<td>Meghan Azad</td>
<td>2nd</td>
<td>Open</td>
<td>University of Manitoba</td>
<td>N/A</td>
<td>Breastfeeding and infant wheeze, atopy and atopic dermatitis: findings from the Canadian Healthy Infant Longitudinal Development Study</td>
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<tr>
<td>Saiful Huq</td>
<td>1st</td>
<td>Research Staff</td>
<td>University of Manitoba</td>
<td>Allan Becker</td>
<td>Comparison of skin-prick test measurements by an automated system against the manual method</td>
</tr>
<tr>
<td>Linda Warner</td>
<td>2nd</td>
<td>Research Staff</td>
<td>The University of British Columbia</td>
<td>Stuart Turvey</td>
<td>The CHILD Study: optimizing subject retention in pediatric longitudinal cohort research</td>
</tr>
</tbody>
</table>

### 2015 CSACI Poster Competition Award Winners

<table>
<thead>
<tr>
<th>Name</th>
<th>Place</th>
<th>Category</th>
<th>Institution</th>
<th>Supervisor</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominik Nowak</td>
<td>2nd</td>
<td>Case Reports</td>
<td>McMaster University</td>
<td>Paul Keith</td>
<td>Sitagliptin associated angioedema not related to concurrent use of ARB or ACE inhibitor</td>
</tr>
<tr>
<td>John Paul Oliveria</td>
<td>1st</td>
<td>Basic Science/Immunology</td>
<td>McMaster University</td>
<td>Gail Gauvreau</td>
<td>Characterization of IgE-expressing B cells in the airways and peripheral blood of allergic asthmatics</td>
</tr>
</tbody>
</table>
Supervised by former AllerGen trainee Dr. Tillie-Louise Hackett, Dr. Mostaço-Guidolin’s research focuses on using nonlinear optical microscopy to understand the changes that occur in the three-dimensional structure of the airways’ elastic and collagen fibres in asthma. Her work aims to help researchers develop better asthma therapies and improve the quality of life for millions of asthma patients.

Dr. Reynolds is working in the laboratory of AllerGen investigator Dr. Brett Finlay to identify the key bacterial species within the microbiota that alter the severity of allergic disease, and to understand whether antibiotic use is linked to the development of allergic disease in both the human population and mouse models.

Recognized internationally for supporting research excellence, the MSFHR has granted more than 1,200 Trainee Awards worth over $38 million. AllerGen trainees embark on diverse career paths

Mentored by some of the best researchers in the world, and working in multisectoral, multidisciplinary teams, AllerGen HQP develop a broad range of highly marketable skills and are able to adapt to evolving academic and business environments.
Since 2005, 211 graduate students and post-doctoral fellows directly involved in AllerGen-funded research projects have found employment across sectors.

In 2015-2016 alone, 29 AllerGen HQP secured employment, making contributions within academia and across the public, private and not-for-profit sectors, including:

**Tahira Batool** (MD, FRCPC) is an allergist at One Healthcare Centre in Ajax, ON.

**Roy Chen** (M.Sc.) is a Medical Laboratory Technologist at Provincial Health Services Authority in Vancouver, BC.

**Melanie Courtot** (PhD) is Gene Ontology Annotation Project Leader at the European Bioinformatics Institute in Cambridge, UK.

**Emma Goosey** (PhD) is a Consultant and KTP Associate at MTS Research Ltd in Cornwall, UK.

**Petya Koleva** (PhD) is employed at Labs Mart Inc. in Edmonton, AB.

**Mandy Pui** (M.Sc.) is a Communications and Strategies Consultant in Vancouver, BC, for non-profit organizations and research institutes.

**Jaclyn Quirt** (MD, FRCPC) is Assistant Clinical Professor in the Division of Clinical Immunology and Allergy, Department of Medicine, and Director of the Clinical Immunology & Allergy Residency Training Program at McMaster University in Hamilton, ON.

**Eli Rosenberg** (MD, FRCPC) is Director, Adult Clinical Immunology and Allergy Service, at Soroka University Medical Center, and Lecturer in Immunology at Ben-Gurion University in Beersheba, Israel.

**Steve Smith** (PhD) is Scientific Advisor – Respiratory in the R&D Chief Medical Office at GlaxoSmithKline Canada in Mississauga, ON.

**Samuel Wadsworth** (PhD) is Co-Founder and Chief Scientific Officer of Aspect Biosystems in Vancouver, BC.
A Snapshot of AllerGen HQP 2015-2016
(n=318)

AllerGen HQP by Research Program (n=263)

- Enabling Platforms (38%)
  - Gene-Environment Interactions 42 (16%)
  - Patients, Policy and Public Health 32 (12%)
  - Biomarkers and Bioinformatics 26 (10%)
- Legacy Projects (62%)
  - The Clinical Investigator Collaborative (CIC) 73 (28%)
  - The Canadian Healthy Infant Longitudinal Development (CHILD) Study 54 (20%)
  - The Canadian Food Allergy Strategic Team (CanFAST) 36 (14%)

AllerGen HQP by Gender
- Male 104 (33%)
- Female 214 (67%)

AllerGen HQP by Province
- Male 104 (33%)
- Female 214 (67%)

Female 214 (67%)
Male 104 (33%)

AllerGen HQP by Research Program (n=263)

- Working on related research 55 (17%)
- Working on AllerGen research projects 263 (83%)
- Canadian 278 (87%)
- Foreign 40 (13%)

Trainees, New Professionals, Research Associates and Technicians (including ASNPN) by Province and University (n=318)

By Province
- Ontario 104 33%
- Alberta 76 24%
- British Columbia 66 21%
- Quebec 43 13%
- Manitoba 16 5%
- Saskatchewan 7 2%
- Nova Scotia 4 1%
- Other 2 1%

Total 318 100%

By University
- The University of British Columbia 70 22.0%
- McMaster University 43 13.5%
- University of Alberta 38 11.9%
- University of Calgary 29 9.1%
- Université Laval 19 6.0%
- University of Manitoba 16 5.0%
- University of Toronto 15 4.7%
- McGill University 8 2.5%
- Queen’s University 7 2.2%
- University of Saskatchewan 7 2.2%
- Simon Fraser University 5 1.6%
- University of Waterloo 5 1.6%
- Université du Québec à Chicoutimi 3 0.9%
- Dalhousie University 2 0.6%
- Université de Montréal 1 0.3%
- Lakehead University 1 0.3%
- International universities 4 1.3%
- Affiliated institutions and organizations 45 14.2%

Total 318 100%
In 2015-2016, AllerGen leveraged its research investments to generate an additional $8.1 million in cash and in-kind support from partner and stakeholder organizations.
## Financial Overview

**AllerGen NCE Inc. Financial Summary 2015-2016**

### Revenues (Cash)

<table>
<thead>
<tr>
<th></th>
<th>2015-2016 (Year 11)</th>
<th>Percentage</th>
<th>2014-2015 (Year 10)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCE Award</td>
<td>4,216,500</td>
<td>94.19%</td>
<td>4,216,500</td>
<td>90.00%</td>
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<tr>
<td>Non-NCE Funds</td>
<td>259,859</td>
<td>5.81%</td>
<td>468,655</td>
<td>10.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,476,359</strong></td>
<td><strong>100.00%</strong></td>
<td><strong>4,685,155</strong></td>
<td><strong>100.00%</strong></td>
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</table>

### Expenditures (Cash)

<table>
<thead>
<tr>
<th></th>
<th>2015-2016 (Year 11)</th>
<th>Percentage</th>
<th>2014-2015 (Year 10)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Programs</td>
<td>3,239,328</td>
<td>70.88%</td>
<td>3,491,984</td>
<td>65.91%</td>
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<tr>
<td>Networking</td>
<td>59,619</td>
<td>1.30%</td>
<td>144,399</td>
<td>2.73%</td>
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<tr>
<td>Training</td>
<td>296,350</td>
<td>6.48%</td>
<td>394,765</td>
<td>7.45%</td>
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<tr>
<td>Communications</td>
<td>60,531</td>
<td>1.32%</td>
<td>66,908</td>
<td>1.26%</td>
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<tr>
<td>Administration</td>
<td>914,436</td>
<td>20.01%</td>
<td>1,199,904</td>
<td>22.65%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,570,263</strong></td>
<td><strong>100.00%</strong></td>
<td><strong>5,297,959</strong></td>
<td><strong>100.00%</strong></td>
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</table>

### Committed Amounts for Future Research

<table>
<thead>
<tr>
<th></th>
<th>2015-2016 (Year 11)</th>
<th>Percentage</th>
<th>2014-2015 (Year 10)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,230,919</td>
<td></td>
<td>1,072,726</td>
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</table>

### All Revenue Sources (Cash and In-Kind) 2015-2016

<table>
<thead>
<tr>
<th></th>
<th>Cash</th>
<th>In-Kind</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCE</td>
<td>4,216,500</td>
<td>–</td>
<td>4,216,500</td>
<td>34.14%</td>
</tr>
<tr>
<td>University</td>
<td>689,448</td>
<td>3,689,980</td>
<td>4,379,428</td>
<td>35.46%</td>
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<tr>
<td>Industry</td>
<td>1,362,152</td>
<td>363,856</td>
<td>1,726,008</td>
<td>13.97%</td>
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<tr>
<td>Provincial</td>
<td>154,874</td>
<td>520,000</td>
<td>674,874</td>
<td>5.46%</td>
</tr>
<tr>
<td>Federal</td>
<td>242,279</td>
<td>56,950</td>
<td>299,229</td>
<td>2.42%</td>
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<td>Hospital</td>
<td>5,000</td>
<td>337,350</td>
<td>342,350</td>
<td>2.77%</td>
</tr>
<tr>
<td>Not-for-Profit</td>
<td>48,029</td>
<td>200,218</td>
<td>248,247</td>
<td>2.01%</td>
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<tr>
<td>Other Sources</td>
<td>288,220</td>
<td>177,003</td>
<td>465,223</td>
<td>3.77%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$7,006,503</strong></td>
<td><strong>$5,345,357</strong></td>
<td><strong>$12,351,860</strong></td>
<td><strong>100.00%</strong></td>
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</table>

In 2015-16, AllerGen’s income from all sources (cash and in-kind) was $12,531,860. Of this amount, AllerGen received a base grant from the NCE in the amount of $4,216,500. AllerGen secured an additional $8,315,360 from other sources. This represents a leveraging of NCE funding at a rate of 1:1.93.
Over the next three years, working closely with its legacy partners and other stakeholders, the Network will complete its research program and focus on translating and commercializing key findings for the benefit of Canadians with allergic diseases.
# Network Participants

## Investigators (n=94)

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edmond Chan</td>
<td>BC Children’s Hospital</td>
</tr>
<tr>
<td>Jean Marshall</td>
<td>Dalhousie University</td>
</tr>
<tr>
<td>Jeffrey Brook</td>
<td>Environment Canada/University of Toronto</td>
</tr>
<tr>
<td>Wade Watson</td>
<td>IWK Health Centre</td>
</tr>
<tr>
<td>Celia Greenwood</td>
<td>McGill University</td>
</tr>
<tr>
<td>Lawrence Joseph</td>
<td>McGill University</td>
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<tr>
<td>James Martin</td>
<td>McGill University</td>
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<tr>
<td>Bruce Mazer</td>
<td>McGill University</td>
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<tr>
<td>Ciriaco Piccirillo</td>
<td>McGill University Health Centre</td>
</tr>
<tr>
<td>Moshe Ben-Shoshan</td>
<td>McMaster University</td>
</tr>
<tr>
<td>Sonia Anand</td>
<td>McMaster University</td>
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<tr>
<td>Russell de Souza</td>
<td>McMaster University</td>
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<tr>
<td>Judah Denburg</td>
<td>McMaster University</td>
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<tr>
<td>Gail Gauvreau</td>
<td>McMaster University</td>
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<td>Manel Jordana</td>
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<td>Paul Keith</td>
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<td>Anthony Levinson</td>
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<td>Joseph Macri</td>
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<td>Parameswaran Nair</td>
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<td>Helen Neighbour</td>
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<td>Malcolm Sears</td>
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<td>Susan Waserman</td>
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<tr>
<td>Carlo Marra</td>
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<tr>
<td>Heather Castleden</td>
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<td>Anne Ellis</td>
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<tr>
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<td>Timothy Takaro</td>
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<tr>
<td>Sharon Dell</td>
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<td>Theo Moraes</td>
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<td>Wendy Ungar</td>
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<tr>
<td>Denise Daley</td>
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<td>Brett Finlay</td>
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<tr>
<td>Jeremy Hirota</td>
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<td>Larry Lynd</td>
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<tr>
<td>Kelly McNagny</td>
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<td>Andrew Sandford</td>
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<tr>
<td>Elie Haddad</td>
<td>The University of British Columbia</td>
</tr>
<tr>
<td>Catherine Lernière</td>
<td>Université de Montréal</td>
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<tr>
<td>Catherine Lapprise</td>
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<tr>
<td>Jamila Chakir</td>
<td>Université du Québec à Chicoutimi</td>
</tr>
<tr>
<td>Samuel Godfroy</td>
<td>Université Laval</td>
</tr>
<tr>
<td>Louis-Philippe Boulet</td>
<td>Université Laval - IUCPQ</td>
</tr>
<tr>
<td>Dean Befus</td>
<td>University of Alberta</td>
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<tr>
<td>Stuart Carr</td>
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<tr>
<td>Catherine Field</td>
<td>University of Alberta</td>
</tr>
<tr>
<td>Name</td>
<td>Affiliation</td>
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<tr>
<td>Malcolm King</td>
<td>University of Alberta</td>
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<td>Gerry Giesbrecht</td>
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<td>Bonnie Kaplan</td>
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</table>
HQP and Research Staff (n=318)

Shelley Abercromby
Daniel Adams
Omid Aghamirian
Loubna Akhabir
Mustafa Al-Saiedy
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Amrit Singh, PhD (c), observer President, ASNPN; The University of British Columbia (from July 2015)

Lianne Soller, PhD (c), observer President, ASNPN; McGill University (to June 2015)

Wendy Street, observer Senior Program Manager, NCE Secretariat
## AllerGen Committees

### Research Management Committee (RMC) Membership

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Position</th>
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<tbody>
<tr>
<td>Judah Denburg, MD, FRCPC</td>
<td>(Chair) Scientific Director and CEO, AllerGen NCE Inc.</td>
</tr>
<tr>
<td>Allan Becker MD, FRCPC</td>
<td>Professor and Head, Section of Allergy &amp; Clinical Immunology, Department of Pediatrics &amp; Child Health, University of Manitoba</td>
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<td>Dean Befus, PhD</td>
<td>Professor, Division of Pulmonary Medicine, Department of Medicine, University of Alberta</td>
</tr>
<tr>
<td>Jeff Brook, PhD</td>
<td>Senior Scientist, Air Quality Research Branch, Environment Canada; Assistant Professor, Division of Occupational &amp; Environmental Health, Dalla Lana School of Public Health, University of Toronto</td>
</tr>
<tr>
<td>Tim Caulfield, LLM, FRSC, FCAHS</td>
<td>Canada Research Chair in Health Law &amp; Policy; Trudeau Fellow and Professor, Faculty of Law and School of Public Health; Research Director, Health Law Institute, University of Alberta</td>
</tr>
<tr>
<td>Ann Clarke, MD, M.Sc. FRCP(C)</td>
<td>Professor, Division of Rheumatology, Department of Medicine, University of Calgary; The Arthritis Society Chair in Rheumatic Diseases</td>
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<tr>
<td>Terry Delovitch, PhD</td>
<td>Professor Emeritus, Department of Microbiology &amp; Immunology, Western University (to June 2015)</td>
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<tr>
<td>Susan Elliott, PhD</td>
<td>Professor, Department of Geography and Environmental Management, University of Waterloo</td>
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<td>Jean Marshall, PhD</td>
<td>Professor, Departments of Microbiology &amp; Immunology, and Pathology, Dalhousie University</td>
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<tr>
<td>Kelly McNagny, PhD</td>
<td>Professor, Department of Medical Genetics, The University of British Columbia; Co-Director, The Biomedical Research Centre; Scientific Director for the Centre for Drug Research and Development (CDRD)</td>
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<tr>
<td>Paul O'Byrne, MB, FRCP(C), FRSC</td>
<td>Professor and Chair, Department of Medicine, McMaster University</td>
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<tr>
<td>Mark Raizenne, SD</td>
<td>Associate Director, Public Health, McLaughlin Centre for Population Risk Assessment, University of Ottawa</td>
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<tr>
<td>Stuart Turvey, MBBS, DPhil, FRCP(C)</td>
<td>Director of Clinical Research, Child &amp; Family Research Institute; Professor, Division of Allergy and Immunology, Department of Pediatrics, The University of British Columbia</td>
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Diana Royce, EdD, observer Managing Director and COO, AllerGen NCE Inc.
Wendy Street, observer Senior Program Manager, NCE Secretariat
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- **Thierry Bourgeois, MScA** Adjoint au vice-recteur à la recherche et à la création and vice-rectorat à la création, Pavillon des Sciences de l’éducation, Université Laval
- **David Brener, PhD** Principal, David Brener & Associates Inc.
- **Judah Denburg, MD, FRCP(C)** Scientific Director and CEO, AllerGen NCE Inc.
- **Sylviane Duval** Knowledge Transfer Specialist
- **Neal Lemon, PhD, MBA** Technology Transfer Officer (Health Sciences), Industry Liaison Office, University of Saskatchewan
- **Luc Marengère, PhD** Managing Partner, TVM Capital Life Science
- **Kevin O’Brien Fehr, PhD** Consultant
- **Brian Underdown, PhD** Managing Director, Lumira Capital
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Susan Waserman, MD, FRCP(C)  Professor, Division of Clinical Immunology and Allergy, Department of Medicine, McMaster University
**AllerGen Students and New Professionals Network (ASNPN) Executive**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>University/Region</th>
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<tr>
<td>Lianne Soller, PhD (c)</td>
<td>President</td>
<td>McGill University</td>
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<td>Communications Director</td>
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<tr>
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<td>Erika Ladouceur</td>
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<tr>
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<td>Judah Denburg, MD</td>
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<td>Diana Royce, EdD</td>
<td>Managing Director and COO</td>
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<tr>
<td>Kim Wright</td>
<td>Manager, Communications and Knowledge Mobilization</td>
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<td>Finance Officer</td>
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<tr>
<td>April O’Connell</td>
<td>Research Administrator</td>
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<tr>
<td>Marshall Beck</td>
<td>Administrative Coordinator, Communications and Knowledge Mobilization</td>
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