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AllerGen reAction

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In this issue:

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The NCE program is a joint initiative of the Natural Sciences and Engineering Research Council, the Canadian Institutes of Health Research, the Social Sciences and Humanities Research Council and Industry Canada.

Canada

Innovation... from cell to society[2]

Perhaps there is truth to the adage that dogs and their masters look alike. At the genetic level, we are about 70% like man's best friend, according to a leading genomic researcher.

Dr. J. Craig Venter, a visionary in the field of genomic research and leader of the first privately funded team to decode the human genome, spoke to an audience of 184 delegates representing industry, universities and hospitals, not-for-profit organizations and government agencies and departments at the Network's second annual research conference, *Innovation from cell to society*[2], which ran February 11-13, 2007.

For many, hearing Venter's presentation was a once-in-a-lifetime opportunity. He spoke of his many quests, from mapping the genetic code of the first free-living organism—the Haemophilus influenzae bacterium—to his successful decoding of the human genome to his oceanic adventures across the planet, analyzing the genetic information of the vast microbial life that fill the Earth's oceans.

Dr. Craig Venter during his keynote address.

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Federal budget earmarks new funding for NCE

The Government of Canada announced more than $15 million in additional funding for the Networks of Centres of Excellence (NCE) programme.

In its March 2007 budget, the government promised $11 million for the creation of up to five new networks to be proposed and led by the private sector. This initiative will begin in 2008-09.

Another $4.5 million will go towards the establishment of a new Industrial Research and Development Internship programme, aimed at partnering graduate students and post-doctoral candidates with businesses. These one-semester internships will allow business and students to share knowledge and skills, while providing interns with hands-on research experience in an industry setting.

AllerGen NCE Inc. is dedicated to creating 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 in Canada and around the world.

International research event features AllerGen investigators

AllerGen Scientific Director Dr. Judah Denburg and AllerGen Principal Investigator Dr. Mark Larché, both of McMaster University, were invited speakers at the 2007 World Immune Regulation Meeting attended by 800 delegates.

Denburg and Larché were among more than 60 internationally renowned immunology specialists presenting at the international meeting held in Davos, Switzerland, April 11-15. AllerGen was a Silver Sponsor of the meeting, which was organized by the Swiss Institute of Allergy and Asthma Research.

The five-day meeting brought together internationally acclaimed experts from around the globe and across disciplines.

"The World Immune Regulation Meeting provided a tremendous networking opportunity," says Denburg. "We had the chance to promote AllerGen to renowned scientists from across several continents."

Several symposia and practical workshops were held, covering a variety of topics including biobanking, sampling issues, cellular and molecular interactions in immune regulation, and novel drug discovery and development.

Network News

AllerGen Board Chair appointed Chancellor at Hamilton's McMaster University

AllerGen congratulates Mr. Lynton Wilson, chair of AllerGen's Board of Directors, on his appointment as the 17th Chancellor at the Network's host institution, McMaster University in Hamilton, Ontario. As Chancellor, Wilson will serve a three-year term as the ceremonial head of the university, beginning this September.

Special thanks to International Scientific Excellence Advisory Committee (ISEAC)

AllerGen would like to thank the members of AllerGen's inaugural ISEAC for their important contributions to the Network in its initial years.

Dr. Bruce Bochner of Johns Hopkins Asthma and Allergy Center, Dr. William Busse of the University of Wisconsin Medical School, Dr. Monique Capron of the Institut Pasteur de Lille, Dr. Noreen Clark of the University of Michigan Health System, Dr. Juha Kere of the Karolinska Institutet, Dr. Robert Shleimer of the Northwestern University Feinberg School of Medicine, Dr. Scott Weiss of the Harvard Partners Center for Genetics and Genomics at Brigham's and Women's Hospital, and Dr. Peter Weller of Beth Israel Deaconess Medical Center provided their guidance and expertise to AllerGen during its first two years of operation.

AllerGen is moving to an ad hoc process for international review and will be looking to tap the expertise of both new and former committee members in its upcoming assessment of new AllerGen programmes of research due May 2, 2007.

Congratulations

AllerGen Board member Dr. Chaviva Hosek has been named an Officer of the Order of Canada in the area of Education and Public Service. The Order of Canada recognizes outstanding achievements by Canadians in various fields. As an Officer, Hosek will be recognized for a lifetime of achievement in service to Canada or humanity at large.

Hosek has been the President and CEO at the Canadian Institute for Advanced Research since 2001. Her list of achievements include university professor, president of the National Action Committee on the Status of Women, elected member of Ontario's Liberal government in 1987, and a director of policy in the office of Prime Minister Jean Chretian.

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AllerGen Board member Dr. Aubrey Tingle received the 2007 British Columbia Biotechnology Award in the category of Leadership. LifeSciences BC credits Tingle, the president and CEO of the provincially mandated Michael Smith Foundation for Health Research since 2001, as one of the forces behind bringing BC to the international stage of world-class research. In its announcement, LifeSciences BC describes Tingle's contribution as having "an unprecedented impact" on strengthening publicly funded research, "the foundation of the life sciences and biotechnology industry in British Columbia."

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The Allergy, Asthma and Immunology Society of Ontario awarded AllerGen trainee Loie Goronfolah the *2007 Schering Resident's Award* for research on April 21, 2007.

Nine AllerGen investigators and trainees worked on the project, *Comparative responses to nasal allergen challenge in allergic rhinitic subjects with or without asthma.* Goronfolah is supervised by AllerGen investigator Dr. Paul Keith.

Looking to the stable for answers

Is asthma reversible? Believe it or not, but the answer may be coming to you straight from the horse's mouth!

AllerGen NCE Inc. and the Canadian Institutes of Health Research (CIHR) are funding partners on a novel research programme led by clinician-scientist Dr. Jean-Pierre Lavoie of the Université de Montréal, Faculty of Veterinary Medicine, involving asthmatic horses. This research team aims to find out whether lung remodeling caused by asthma is a reversible condition.

Most asthma research involving animal models is undertaken using mice and rats, which have a short lifespan relative to humans and do not develop the disease naturally in their environment. Lavoie notes that asthma sufferers and horses with heaves (asthma) share similar disease characteristics, including airway remodeling—structural changes to the walls of the airway—and increased muscle mass. This unique study will look at airway smooth muscle remodeling in the lung tissue of 12 horses over one year using a repeated process of whole lung biopsy.

AllerGen trainee Mathilde Leclére administers Fluticasone.

Periodic minimally invasive thoracoscopic surgery will be used to remove lung tissue samples from the horses during asthma exacerbation and again following a course of treatment with Fluticasone, a drug produced by GlaxoSmithKline. This will enable the research team to assess whether airway remodeling has occurred and if it correlates with clinical improvement of asthmatic horses.

AllerGen investigator Dr. Jean-Pierre Lavoie with a thoracoscopic surgery post-operative research subject.

In addition to Principal Investigator Lavoie, whose veterinary practice is centred at Saint-Hyacinthe, Quebec, the multi-disciplinary research team includes Dr. James Martin, McGill University, who specializes in animal models for asthma; Dr. Jacques Lussier, a molecular biologist, Faculty of Veterinary Medicine, and research assistant Josiane Lefebvre-Lavoie. The project is also providing outstanding research, surgical and sample management including biobanking experience to six Network trainees.

Lavoie notes that although the remodeling caused by asthma also occurs in the periphery of the lung, researchers usually study the central airways because they are readily accessible. This project, however, will allow researchers to gain valuable insights into the long-term changes in lung function in the smaller airways at the lung periphery.

A team of veterinary surgeons from the Université de Montréal led by Dr. Marcel Marcoux, has developed a novel surgical technique for obtaining lung periphery tissue samples under thoracoscopic guidance. This new surgical technique is supported by industrial partner Tyco, which is seeking to extend the use of its surgical tools from abdominal surgery to lung surgery in humans. Additional investigations will look at changes in peripheral blood (supported by a grant from the Natural Sciences and Research Council of Canada), gene expression and genetic analysis.

"This line of inquiry (gene expression) could lead to truly novel discoveries, the implications of which we can examine in collaboration with AllerGen researchers from the Gene-Environment Interactions programme," Lavoie says.

Lavoie credits AllerGen and the CIHR Institute of Infection and Immunity for supporting his novel, multidisciplinary approach to the use of animal models to inform the treatment of asthma in humans within this groundbreaking research programme.

AllerGen research a highlight at Hamilton conference

Conference continued from page 1

Venter's conference-opening keynote address highlighted the importance of gene-environment interaction, a topic of study that AllerGen has dedicated an entire programme of research to—Programme A: Gene-Environment Interactions.

"I think that, within a decade we will have databases of millions of human genomes. Then, instead of looking to dogs or other animals to answer questions about environmental effects on disease, we will be in a position to answer just about any question concerning nature versus nurture.

"We will be able to do complex multi-gene analyses, looking at which genes and what variations contribute to personality, to behaviour, to disease, to long life."

Venter said that until now, science has used single gene studies in a "crude attempt" to look at gene-environment interactions. With the application of technological advances like high throughput sequencing machines, designed to analyze millions of gene sequences in a relatively short time, new tools will help define the future of genomic research.

Dr. Scott Tebbutt, a principal investigator in AllerGen's Gene-Environment programme of research, described Venter's presentation as a fascinating journey through the ground-breaking work that he and his colleagues carried out.

"He is certainly a pioneer in Genomics-based research," Tebbutt said.

In addition to three internationally renowned keynote speakers, 36 AllerGen investigators, industry and non-profit partners and government representatives engaged the audience with presentations highlighting AllerGen-funded research, the importance of academic, industry and government partnerships and the expanding role of patient advocacy groups in translating research findings into useable knowledge.

Seven symposia spanned a multitude of topics: gene-environment interactions leading to allergy and asthma; environmental and social determinants of allergic disease; the importance of partnerships in clinical research; food allergies; AllerGen's proposed CHILD study; work-related allergy and asthma; and mind-body interactions.

Dr. John Frank, the scientific director at the Canadian Institutes of Health Research (CIHR) Institute of Population and Public Health, and Dr. Michael Meaney, the director of the Maternal Adversity, Vulnerability and Neurodevelopment Project at McGill University, were also keynote speakers on the final day of the conference.

Frank's presentation spoke to the challenges and opportunities in planning a birth cohort. Pointing to AllerGen's proposed Canadian Healthy Infant Longitudinal Development (CHILD) study, he said that smaller, more focused cohorts like CHILD tend to provide a wealth of strong data that can be used in both the short and long terms, and are more likely to obtain government research money because of the potential for immediate results.

Lack of evidence to formulate policy

Frank also pointed to Health Canada and Environment Canada as being "desperate" for data that they can use to create and modify policy, but said that generally, after the initial data gathering, government does not commit long-term funding to follow-up studies, a challenge that must be addressed by the research community.

This lack of funding commitment to large cohorts with high price tags is not solely a Canadian issue, according to Frank. Citing proposed international cohorts, Frank questioned whether some of these studies would see the light of day, even after years of planning.

Focusing on the conference theme, gene-environment interactions, Meaney's closing presentation delved into the lesser-known field of epigenetics—the study of environmental effects on gene expression.

Meaney's research focuses on the effect that maternal or parental care can have on the development of neural systems that regulate stress responses in their offspring. Using animal models, Meaney showed examples of changes to both the physical and neurological development of offspring who were reared by mothers exposed to various environmental stimuli. According to Meaney, variations in parental care can alter the activity of genes in the brain, such as those regulating response to stressors and reproduction. Meaney said these changes are structural, but do not alter the sequence of DNA; the activity of a particular sequence is altered.

The conference closed with a Gala Banquet held at the newly renovated Art Gallery of Hamilton.

DELEGATE REPRESENTATION

184 delegates in attendance

Representatives from university/hospital organizations: 72%
Representatives from non-profit organizations: 13%
Representatives from business and industry: 11%
Representatives from government agencies/departments: 4%

Scrapbook

Non-profit director sees a role for her organization

Bridging the gap between research and patients

As a patient advocate, Anaphylaxis Canada's executive director Laurie Harada says AllerGen's annual conference, *Innovation from cell to society*[2], left her feeling hopeful that research being conducted in Canada and elsewhere will improve health outcomes for those suffering from anaphylaxis and other allergic diseases.

AllerGen's role as a catalyst of collaborative research has succeeded in linking researchers with groups like Anaphylaxis Canada, the Asthma and Allergy Information Association, l'Association québécoise des allergies alimentaires, the Canadian Allergy, Asthma and Immunology Foundation, the Asthma Society of Canada and the Canadian Lung Association, as well as industry and government organizations. This multi-disciplined, multi-sectoral approach to solving real-world issues that face allergic disease sufferers creates idea-rich research environments for clinical, academic and industry representatives, and for patient advocates like Harada.

Harada, who presented as part of a symposium on research, education and knowledge translation in the areas of food allergy, anaphylaxis and asthma, says that the conference showed that researchers, whether looking at anaphylaxis or asthma, are grappling with the same issues—income as a barrier to medication, teens exhibiting high-risk behaviour, poor self-management of disease and other factors affecting disease management.

The face of allergy

Although Harada doesn't have a science background, she believes it is important for Anaphylaxis Canada to participate in these types of events. Anaphylaxis Canada acts as a voice for children and parents who are at risk, and provides the information and support to those families who need their hope reaffirmed.

"They need to know that work is ongoing. We (Anaphylaxis Canada) bridge the gap between research and the patient," she says. "We don't perform the research, but Anaphylaxis Canada can disseminate practical tools to help those who live with this disease to live well."

Harada views her role at the conference as providing "the human face" of allergic disease to investigators and representatives from both industry and government.

"We're the reason for the research, the reason for innovation from cell to society. We're the end piece, that societal element."

Anaphylaxis Canada Executive Director Laurie Harada responds to questions during a panel discussion at AllerGen's conference.

Trainee dominates conference poster competition

Twenty-five abstracts were submitted to the Trainee Poster Competition for display at AllerGen's Second Annual Conference: *Innovation from cell to society*[2]. Participants represented seven universities (UBC, Laval, Toronto, McMaster, McGill, Alberta, Manitoba) with at least two representatives from every Trainee Level from among AllerGen's 119 research trainees.

Poster viewing took place during every scheduled break, lunch and during a networking reception on the opening day of the conference. Trainees had the opportunity to disseminate their AllerGen-funded research, and gain valuable feedback from colleagues and mentors within our Network.

Adjudicators chose five competitors for oral presentations based on their communication skills, style and overall interest of topic.

Congratulations to winners Moshe Ben-Shoshan (First prize $500) and Jason Pole (Second Prize $250) in the Oral Poster Competition, and Jason Pole (First prize $500) and Steven Maltby (Second prize $250) in the Poster Display Competition.

Scientific Director Dr. Judah Denburg (left), trainee Jason Pole and AllerGen investigator Dr. Jeff Brook pose after Pole's first- and second-place wins in AllerGen's trainee competitions held at the network's annual research conference.

Innovation from cell to society²

Conference Scrapbook

AllerGen trainee Shannon Cope speaks about her poster with competition adjudicator and AllerGen Programme Leader, Dr. Susan Elliott.

Invited guest Mr. David Sweet, MP for Ancaster-Dundas-Flamborough-Westdale, delivers a welcome message from the federal government.

Mr. Fakhredine Shadman of Novartis Pharmaceuticals introduces keynote speaker Dr. John Frank.

Former NCE programme officer Ms. Diane Allan speaks with Dr. Rickey Yada, scientific director at the Advanced Foods and Materials Network.

Ms. Mary Allen, CEO at the Allergy and Asthma Information Association, chats with Dr. Eric Leith, board chair at the Canadian Allergy, Asthma and Immunology Foundation.

AllerGen Principal Investigator Dr. John Bienenstock speaks with AllerGen investigator Dr. Martin Stampfli.

AllerGen Programme Leader Dr. Malcolm Sears enjoys time at the conference welcome reception.

In the lab

Looking at new ways to apply basic research results

Dr. Jeremy Scott is a man with a mission.

Scott, an AllerGen principal investigator, hopes that his research, which looks at how various pollution exposures affect the airways of mice, will not only inform other studies within the AllerGen network, but will also give policy makers the evidence they need to create tougher regulations governing air quality.

Leading a team of 12 investigators representing five universities, three hospitals, Health Canada and Environment Canada, Scott's AllerGen-funded study, *Cardiopulmonary consequences of air pollution in a murine (mouse) model of allergic asthma*, should be completed over the next few months.

His goal is to provide causal evidence that government decision-makers need to move forward with more stringent regulations aimed at restricting everyday exposure to air pollution that adversely affects the health and quality of life for Canadian adults and children.

"It is our intent that the results... will be used to clarify areas for the regulation of pollution exposures that lack precise recommendations," Scott said. "Simply put, it is hoped that the findings of our investigations will provide a reason to restrict exposures where one has not yet been provided."

Scott also hopes that results from this project can be used to corroborate findings in another AllerGen study led by Principal Investigator Dr. Frances Silverman. Silverman's research focuses on human exposure to air pollution and its effect on asthma.

"Our general plan has been, and continues to be, to feed back and forth between the studies."

Since its inception in 2004, AllerGen has encouraged investigators to "think outside the box" by looking at other fields of study spanning multiple sectors, says Scientific Director Dr. Judah Denburg.

Scott is doing just that. Currently, he hopes to bridge the gap between results from his animal studies and apply those findings to benefit human health. Newly developed collaborations with Dr. James Scott (University of Toronto; not related) and Dr. Tim Takaro (Simon Fraser University) has Scott hoping that his mouse exposure model can evolve into a kind of bioassay system—a method to test the strength and reaction of new substances or combinations of substances—used to study the effects of household dust on children who show symptoms of allergy and asthma. In another collaborative relationship, Scott hopes that exposures of airway cells that exhibit protective tendencies in an artificial environment will further reinforce the link between animal and human studies, showing the importance of continued research using his animal models.

"The networking between AllerGen investigators has not only introduced collaborations in areas that are peripheral to my primary interests, but has connected me with investigators who have expertise in areas relevant to my main research programme," Scott says.

Leveraging networking opportunities

As a new faculty member at the University of Toronto, Scott credits his participation in the AllerGen Network for the rapid establishment of the environmental component of his research programme. He also believes that his affiliation with the Network is contributing to his growing reputation on a national level—he has been an invited reviewer for several journals and granting agencies.

Currently, Scott supervises three AllerGen trainees who fall under the auspices of the Network's Highly Qualified Entrepreneurial Personnel program. He believes support for these trainees has not only provided them the chance to learn and expand their skills in a lab setting, but has presented many opportunities to improve their oral presentation skills through various trainee symposia and competitions; to gain experience at specialized workshops like the Analysis of Asthma Phenotype Workshop held in Montreal in October 2006; and to initiate contacts with representatives from academia, industry, government and non-profit organizations.

AllerGen collaborations leading to partnerships

Dr. Jeremy Scott and another (unrelated) AllerGen investigator, Dr. James Scott, are currently developing a new delivery system to test real-world air particles on conscious mice, mimicking the real-world exposures that Canadians face everyday.

While not an AllerGen-supported project, Scott believes the creation of this exposure system will benefit various Network studies of allergic and related immune diseases, by testing the health effects of various exposures to dust, air particles, mould, fungi and more. AllerGen research that could benefit from the use of this new delivery system includes projects looking at work-related asthma and allergy, indoor air pollution and the Canadian Health Infant Longitudinal Development Study, according to Scott.

Currently, the two investigators are looking at potential industry partners to collaborate on the further development of this new system.

Barriers to access a hot topic at Network workshop

AllerGen's Public Health, Ethics, Policy and Society programme of research recently held a workshop dedicated to the creation of a research agenda focused on positively impacting children with asthma.

The workshop, *Improving drug benefits for children with asthma: Building a research agenda*, held at the Estates of Sunnybrook in Toronto, Ontario, was attended by 30 AllerGen investigators and partners, representing the insurance, pharmaceutical and marketing industries, hospitals, government agencies, universities, and patient advocacy and professional associations.

Participants, drawn from across sectors and disciplines, identified social, economic and behavioural barriers to access and care facing asthmatic children and their families that can inform the development of a future research programme, leading to strategies to improve children's access to optimal asthma management and potential partners for this multidisciplinary research initiative.

The day-long event provided the basis on which Principal Investigator Dr. Wendy Ungar and her team can move forward in planning a research programme to address the challenges children and their families face in achieving optimal asthma management.

Workshop topics included:

- key factors that impact a child's access to medication—drug plans, demographics, socioeconomic status, resources available to families and the parental/family belief system;
- identifying the major challenges that, if addressed, would go the furthest in improving a child's access to medications, tools and services that would help him achieve optimal control of his disease;
- improving asthma management;
- an interactive panel examining the diverse provincial approaches to drug programmes for children and strategies to improve a child's access and care.

Keeping dinner tables allergen-free topic of interest for federal agency

Dr. Joyce Boye wants to help the food industry sort through the "confusion" of product labelling, leading to a more effective system that ensures the safety of Canadian children and adults with food allergies.

Boye, a research scientist at Agriculture and Agri-Food Canada, is one of 42 principal investigators at the federal agency to receive funding in 2007 for research aimed at enhancing the quality and safety of food, improving the environmental performance of agriculture and promoting the understanding, conservation and development of Canada's bioresource.

Her project, *Identification, detection and development of intervention strategies for the control of food allergens along the food chain*, will look at new and improved ways to identify current and future food allergens, and develop new strategies and technologies that manufacturers can use to avoid these allergens being consumed by food-sensitive and allergic Canadians.

According to Health Canada, 31.7% of all food recalls in Canada from April 2005 to March 2006, were due to undeclared allergens on mislabelled food products.

"Our objective is to help the food industry provide Canadians with better quality food and accurately labelled products," Boye said.

The study will also look at what happens to an allergen—does its allergic potency increase, decrease or remain the same—once it travels through the production process. In addition, her team hopes to identify alternatives to known allergens that can be used in place of those foods that cause reactions.

Boye would like to "push this field further" by developing new collaborations with research organizations like AllerGen—a health-focused network of investigators from multiple disciplines, including many from the medical community. Boye believes uniting these two fields of study–agriculture and health—will provide medical support and evidence to research that will inform policy and procedure, and ultimately help food manufacturers provide better-labelled and safer products to consumers.

Programme provides specialized training

AllerGen is launching a new programme aimed at leveraging existing academic resources to further the professional development of its Network investigators and trainees.

The *Specialized Equipment and Lab Transfer Programme* is available to anyone in the Network who is interested in gaining experience using specialized equipment, research platforms and technologies located at participating institutions.

Leveraging the network structure through the sharing of resources, including knowledge, materials and technology, is an underlying objective for the NCE program.

Research platforms, technology and equipment in the AllerGen Network include a microarray genotyping facility at the iCAPTURE Centre in Vancouver; NMR spectroscopy and analysis at the University of Alberta; and new, innovative techniques of nasal and bronchial allergen provocations at Laval and McMaster universities.