

Airways

Official Newsletter for AllerGen's Highly Qualified Entrepreneurial Personnel

www.allergen-nce.ca

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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.



Program provides specialized training to Network

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

The *Specialized Equipment and Lab Transfer Program* 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

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*Have a great picture or idea
for an article?*

Send it to abernar@mcmaster.ca

Conference Scrapbook

AllerGen's Second Annual Research Conference, *Innovation from cell to society*², drew record numbers of Network investigators, trainees and partners. Read more about the two-day event held February 11-13, on pages 2-4.

On Tuesday, May 1, celebrate **World Asthma Day**

*by promoting awareness and
management of this chronic disease*

Asthma afflicts 300 million people worldwide and killed more than a quarter of a million people globally in 2005, according to the World Health Organization.

According to Statistics Canada, over eight percent of the nation's population, aged 12 and over, suffers from asthma. That means more than 2.2 million Canadians have this disease, and the incidence rate shows no signs of slowing.

World Asthma Day is organized by the Global Initiative for Asthma (GINA). GINA aims to reduce the impact of asthma by working with health care and public health officials worldwide. Through its promotion of sound prevention and management policies and events like World Asthma Day, GINA representatives hope to improve the lives of those suffering from this chronic disease.

For more information about GINA or World Asthma Day, go to www.ginasthma.com.

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.

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 genome of a human being to his oceanic adventures across the planet, analyzing the genetic information of the vast microbial life that fill the Earth's oceans.

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.

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Discover Your Entrepreneurial Future at trainee symposium

Our trainees had such a great time at the First Annual Trainee Symposium in King City, Ontario, that we decided to host this annual event there every year.

The Second Annual Trainee Symposium: *Your entrepreneurial future* will be held at the Kingbridge Centre, May 16-18, 2007. This year will focus on entrepreneurialism with dynamic venture capitalists and savvy business owners who have life science backgrounds.

An interactive career panel will feature successful individuals representing a variety of career paths, and a communications skills development workshop will provide tips and methods to improve presentations, reports and abstracts. There will also be plenty of time for networking, poster viewing and exploring all that the Kingsbridge Centre has to offer.

For more information visit the HQEP section of the AllerGen website, www.allergen-nce.ca

Specialized Equipment continued from page 1

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.

The program will provide travel and accommodation support for individuals or small groups wishing to conduct a site visit to a member institution or research centre in order to learn about equipment, platforms and technology that are not

available at their own institutions.

A total of \$35,000 has been allocated to support this program. A complete list of available specialized equipment, technologies, unique learning opportunities, and the application form are available for download on the AllerGen Website at www.allergen-nce.ca. To receive funding from this program, applicants must submit a Learning Plan to be approved by AllerGen. Applications will be reviewed on a first come-first serve basis.

Trainees representing AllerGen at Canadian, international events

Three trainees will be representing AllerGen at the American Thoracic Society (ATS) International Conference in San Francisco, May 18-23, 2007.

The ATS conference is the largest meeting of pulmonary researchers and clinicians in the world. Gurpreet Singhera, a research associate from the iCAPTURE Centre in Vancouver, and Jason Pole, a PhD trainee at the University of Toronto, both had abstracts selected for poster display. MSc trainee Michelle North of the University of Toronto, has been chosen to orally present her study *Arginine metabolism in murine allergic asthma* in a mini-symposium.

Pole will also be attending the Canadian Society for Epidemiology and Biostatistics (CSEB) meeting in Calgary, May 28-31, 2007. The CSEB brings together over 300 delegates undertaking research in various substantive areas, all with the common underlying focus of epidemiological methods. Pole's abstract *Antenatal steroid therapy for fetal lung maturation: Is there an association with childhood asthma?* has been accepted for an oral presentation.

New AllerGen-STIHR Studentships

The Fall/Winter AllerGen-STIHR competition yielded three new positions. All three trainees will be funded within the *Asthma and Allergy: From molecular regulation to population health* STIHR at the University of Manitoba. Congratulations to Masters students Helen Muleme (supervised by Jude Uzonna), Larisa Latoski (supervised by Kent HayGlass) and Stephanie MacPherson (supervised by Kent HayGlass).

Innovation from cell to society² Conference Scrapbook

Conference continued from page 2

"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 partner-



Dr. Craig Venter during his keynote address.

ships 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 attain 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 study, 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.

Conference Delegates 2007

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%

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.

AllerGen
trainee
Yohan Bossé
peruses the
conference
program.



AllerGen trainee Idongesit Obiefuna chats with Network Scientific Director Dr. Judah Denburg.

U of T trainee dominates poster 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.

Twenty-five abstracts were submitted for display at AllerGen's Second Annual Conference: *Innovation from cell to society²*. 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 the Network.

Adjudicators scored all 25 posters according to the degree of scientific rigor and originality of the research; quality of the presentation including creativity of the poster project display and clarity/comprehensiveness of the presentation, and; expected effectiveness of the plans to communicate research findings to decision makers. Five authors were chosen 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.

Looking to the stable for new asthma model

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 CIHR Institute for Infection and Immunity 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 in 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 share similar disease characteristics, including airway remodeling, increased muscle mass, increased granulocytes and a TH2 cytokine bias. This unique study will look at airway smooth muscle remodeling in the lung tissue of 12 horses (six symptomatic and six asymptomatic controls) over a one-year period using a repeated process of whole lung biopsy.

Periodic minimally invasive thoracoscopic surgery to remove lung tissue samples will be taken 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 undertake laser microdissection of lung tissue samples before, during and after Fluticasone treatment to assess whether airway remodeling has occurred and correlates with clinical improvement of asthmatic horses.

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 Network trainees Mathilde Leclère (Doctor of Veterinary Medicine and PhD candidate); Anouk Lavoie Lamoureux (PhD candidate); Trohadio Munoz (MSc candidate), Laureline Lecoq (DES large animal equine internal medicine resident); Marie-Laure Cortes (Intern, Equine Medicine and Surgery); and Kantuta Moran (undergraduate student).

Lavoie notes that the remodeling caused by asthma also occurs in the periphery of the lung. Normally researchers study the central airways because they are readily accessible, however, this project will allow researchers to gain valuable insights into the long-term changes in lung function in the airway smooth muscle mass of the smaller airways at the lung periphery. Laser microdissection of the smooth muscle tissue is expected to yield significant new insights into lung tissue remodeling.

For the study of the temporal variation in tissue remodeling, a team of veterinary surgeons from the Université de Montréal led by Dr. Marcel Marcoux, has developed a novel surgical



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



AllerGen trainee Mathilde Leclère (left) administers Fluticasone.

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. An investigation of the role and changes in peripheral blood and lung neutrophils in the horses under study is being supported by an NSERC grant. The role of neutrophils in horses parallels the role and action of eosinophils in humans.

In addition, gene expression will be studied using Subtractive Suppressive Hybridization, microarray technologies and real time PCR. The wild card in the team's research program is the genetic analysis being undertaken. Lavoie notes "This line of inquiry 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 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.

The team has also benefited from AllerGen's network structure. It has leveraged the expertise of iCapture technicians at the University of British Columbia to provide advice about optimizing the results of the team's use of laser microdissection technology in its analysis of the banked lung tissue samples.