THE UNIVERSITY OF BRITISH COLUMBIA VOL 54 | NO 11 | NOVEMBER 6, 2008

# UBC REPORTS

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# Lest we forget...those who do return

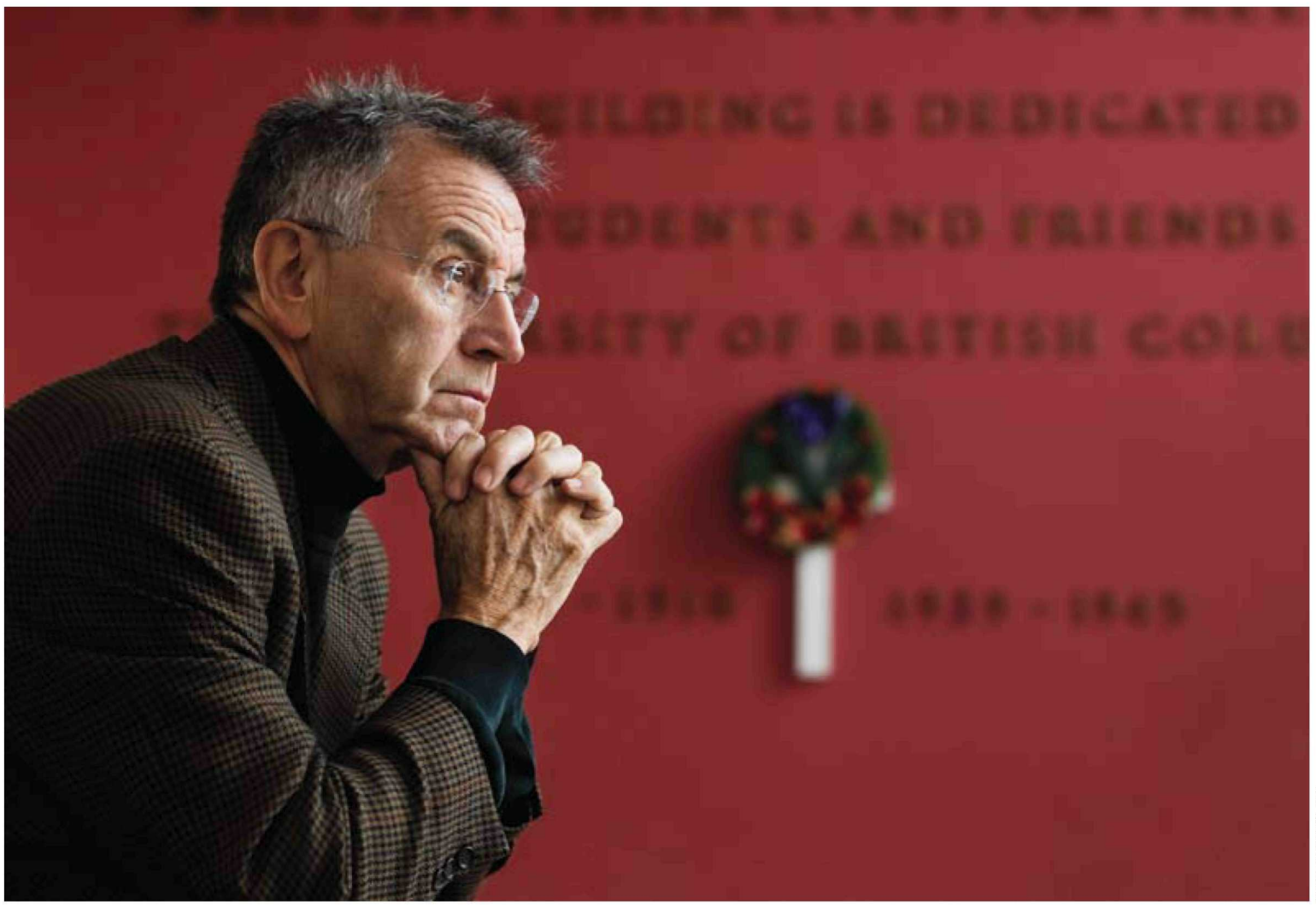

PHOTO: MARTIN DEE

*Prof. Westwood initiated the Veterans Transition Program, designed to help soldeirs transition back to civilian life.*

**BY MARVIN WESTWOOD**
Professor, Deptartment of Educational and Counselling Psychology and Special Education

On the 11th hour of the 11th day of the 11th month, Canadians will pause for two minutes of silent tribute to remember the thousands of men and women who lost their lives in wars in Europe, Korea, and more recently in Afghanistan.

We should also take the time to remember and care for our soldiers who do return from war. These are the soldiers that carry the lifelong physical and mental scars of war. It is estimated that 30 per cent of returning soldiers are traumatized in active combat and experience symptoms such as nightmares, sleeplessness, confusion, an inability to concentrate, isolation and overuse of alcohol and drugs. Veteran soldiers are twice as likely to commit suicide as non-veteran civilians. We have a responsibility as members of a civil society to help soldiers transition successfully back into

*continued on page 3*

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# Smart wheelchair remembers daily schedules

**BY BRIAN LIN**

To Pooja Viswanathan, artificial intelligence is about people creating smart tools that maximize human potential.

That's why, while some researchers are developing robotic wheelchairs that simply transport users from one location to another, she's adamant about giving humans the final say.

"It's counterproductive to give people who are already suffering from physical and cognitive impairments wheelchairs that further erode their capacity to make decisions," says the UBC Computer Science PhD student, "when the goal is to give them back their independence."

Currently, elderly people suffering from both physical disability and degenerative diseases such as Alzheimer's are not granted access to powered wheelchairs due to safety concerns.

"It's heartbreaking to see, in many long term care homes, elders slumped over a manual wheelchair because they are too weak or too confused to power their own way to where they want to be. It's frustrating for them and often causes isolation and depression," says Viswanathan, whose brother worked at a nursing home.

Viswanathan has developed a prototype smart wheelchair that could give users better quality of life and free up some healthcare resources at the same time. Named *Navigation and Obstacle Avoidance Help,* or NOAH, the system incorporates a stereo-vision camera that can easily be retrofitted onto any commercially available powered wheelchair, as well as software that learns the behaviour and decision-making patterns of its users.

"The twin cameras work similarly to human eyes," says Viswanathan. "They memorize landmarks to create maps and calibrate distance to avoid collisions – which is the only time the wheelchair takes over control."

Designed to operate on a laptop that fits under the wheelchair, and interact with the user through audio suggestions, NOAH is also capable of incorporating the user's daily schedules.

"For navigation and for people suffering from cognitive impairments, audio prompts have been found to be more effective than visual cues," says Viswanathan. "People with cognitive impairments often need extra time to process new information, so it's important that NOAH doesn't harangue them but rather offers suggestions at the right time."

NOAH – and data it collects from the user – can easily be transferred to another wheelchair in case of a move. The prototype is expected to be tested in a partient care facility next year. R

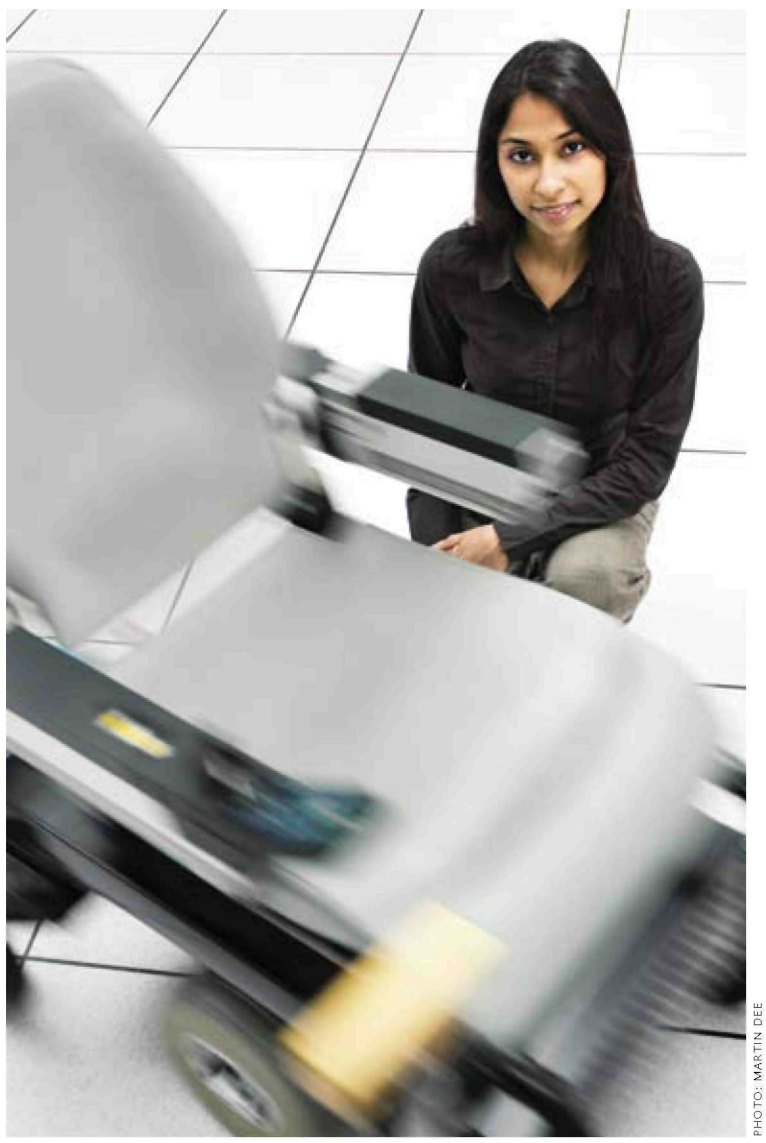

PHOTO: MARTIN DEE

*Pooja Viswanathan has developed a smart wheelchair for elderly people suffering from Alzheimer's Disease.*

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# IN THE NEWS

*Highlights of UBC media coverage in October 2008.* COMPILED BY ANNA MOORHOUSE

## Religion and prosocial behaviour

A new UBC scientific review suggests religion fosters cooperation and trust.

UBC psychologist **Ara Norenzayan** and his assistant **Azim Shariff** reviewed dozens of studies on the emergence of religions, sifting through three decades of accumulated scientific evidence in fields as diverse as anthropology, psychology and economics.

"One explanation for why religions have had such a staying power throughout human history is that they play a role in promoting altruistic tendencies in very large groups" Norenzayan said.

The Science article, titled "The Origin and Evolution of Religious Prosociality," argues that religions were historically key to creating large-scale cohesion in communities.

The study's findings were covered by *USA Today, The Vancouver Sun, The Telegraph, The Guardian, The Toronto Star, The Calcutta Telegraph, The Daily Mail,* and *The Globe and Mail.*

## Aspirin, ibuprofen may cut breast cancer risk

According to UBC researchers, routine use of Aspirin or ibuprofen could cut the likelihood of developing breast cancer.

In a story covered by *CNN, BBC News, Global TV, CTV,* and *CBC News*, and reported in *The Daily Mail, The West Australian, The Globe and Mail, The Vancouver Sun,* and *The Edmonton Journal,* Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) like aspirin and ibuprofen work by inhibiting two immune proteins in the body that have been connected to driving the growth of cancer tumors.

The review, published in the *Journal of the National Cancer Institute in America,* suggests that using NSAIDs reduces the influence of the proteins.

**Mahyar Etminan,** who led the research, calls the results encouraging. "Results from an ongoing trial will be available in 2009."

## UBC tops academics and sustainability rankings

In the Times Higher Education-QS World University 2008 Rankings, UBC held on to its place in the Top 35, second in Canada to McGill and ranking ahead of the University of Toronto, the only other Canadian school to break into the Top 50.

The story was covered by *The Globe and Mail, The Edmonton Journal, The Montreal Gazette* and *The Canadian Press.*

UBC was also the only Canadian school to earn top marks in this year's College Sustainability Report Card released by the Sustainable Endowments Institute (SEI). As reported in *The Calgary Herald, The Times Colonist, Sustainable Business News,* and *GreenBiz,* only 15 of the 300 participating schools qualified for the distinction of College Sustainability Leader, with UBC heralded alongside Ivy League heavyweights like Harvard, Brown and Dartmouth.

## Getting lost

As told by *The Vancouver Sun, The Province, The Denver Post, FOXNews* and *MSNBC,* researchers at UBC and Vancouver Coastal Health Research Institute have documented the first cases of developmental topographical disorder.

The study, published in the journal *Neuropsychologia*, focuses on Sharon Roseman, a Colorado resident who, without any brain damage, gets lost in any environment. UBC postdoctoral fellow **Giuseppe Iaria** said people typically navigate their way through the world looking at specific landmarks and relying on distances.

"If you don't have an ability to create this [mental] map and use the map then you are lost."

In Roseman's case, the sensation of being lost stems from a malfunction in her brain's hippocampus.

PHOTO COURTESY OF UBC ARCHIVES

## War Memorial Gym dedication 1951

INFORMATION COURTESY OF UBC ARCHIVES

The end of the Second World War and the resulting influx of returned soldiers to campus sparked discussion about the establishment of a "living" memorial dedicated to the memory of those who died during the war.

Following a fundraising campaign spearheaded by students and alumni, the new War Memorial Gymnasium was dedicated during the university's fall congregation ceremonies on Oct. 26, 1951. The event was marked by a bugler sounding *The Last Post* and the unveiling of the wall memorial inscription.

Just over two weeks later, the new venue played host to the university's November 11th Remembrance Day ceremony, a ritual since repeated in an almost unbroken chain. R


**UBC REPORTS**

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Executive Director Scott Macrae scott.macrae@ubc.ca
Editor Randy Schmidt randy.schmidt@ubc.ca
Designer Ping Ki Chan ping.chan@ubc.ca
Principal Photography Martin Dee martin.dee@ubc.ca
Web Designer Michael Ko michael.ko@ubc.ca
Contributors Lorraine Chan lorraine.chan@ubc.ca
Brian Lin brian.lin@ubc.ca
Catherine Loiacono catherine.loiacono@ubc.ca
Basil Waugh basil.waugh@ubc.ca
Jody Jacob public.affairs@ubc.ca

Advertising Pearlie Davison public.affairs@ubc.ca
Publisher UBC Reports is published monthly by:
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# No ordinary chickens

BY BRIAN LIN

They may look and walk like chickens, but the two-legged fowls at the Avian Genetic Resource Centre (AGRC) are no ordinary birds.

The AGRC is a partnership between UBC's Faculty of Land and Food Systems and Agriculture and Agri-Foods Canada, based in the Pacific Agricultural Research Centre in Agassiz, B.C.

The nine lines of chickens and nine lines of Japanese quail at the AGRC represent a collection of unique genetic variations and may hold the key to a safer poultry supply and higher economic potentials. Each of the more than 3,500 chickens and quail at the facility is carefully bred and pedigreed. Collectively, they build a living genetic library consisting of a wide variety of genetic mutations. In addition, genetic materials from most of the major chicken breeds in Canada are kept in the deep freeze for preservation. The treasure trove of avian genetics makes B.C. a key resource in the global industry.

"There are currently only two international chicken breeding companies supplying commercial breeding stocks to the whole world," says UBC Avian Genetics Prof. Kim Cheng. "While flock uniformity is convenient for production and processing, the lack of genetic variation also leaves the door wide open for large-scale disease outbreaks.

"A flock could become susceptible to a new strain of virus such as Avian Flu and be completely wiped out," says Cheng.

Poultry stocks today are exposed to more diseases than ever and chronic use of antibiotics has also slowed down the process of new genetic variations that could resist new pathogens.

"The genetic resources at AGRC allow scientists from all over the world to study how genome affects size and meat quality, disease resistance, how well particular breeds could adapt to farm facilities and how we can help industry improve housing environments and breeding practices," says Cheng, who is also an expert on exotic birds.

Poultry and its allied feed and processing sectors are a major industry in Canada. The value of poultry products totalled $2.6 billion in 2004 and there's a new industry blooming abroad promising significant economic opportunities.

"Specialty birds such as Japanese quail, Partridge tinamou and Emu are gaining popularity in Asia and Europe for their oil, meat and eggs," says Cheng. "The expertise being cultivated at AGRC puts B.C. in an ideal position to become a leading exporter of these highly specialized products while diversifying existing operations."

Genome research on birds may also lead to advances in human health, says Cheng, whose work almost three decades ago recently helped successfully reverse congenital blindness in a clinical trial.

In 1980, Cheng discovered a gene mutation in a line of Rhode Island Red (RIR) chickens that produced blindness at hatching. The blind chickens were passed onto the Dept. of Neuroscience at the University of Florida for further analysis and the gene was later sequenced.

"The research group at the U of F found that the gene in the blind chicken had the same sequence as a human gene that caused a form of congenital blindness called Leber's Congenital Amaurosis," says Cheng.

Using the blind chicken in their study, the U of F team further developed a gene therapy that restored vision to the blind chicken in 2006 and last April, a team of researchers from the University of Pennsylvania furthered the method to partially restore sight to three human patients.

Both the RIR and the blind chicken lines are housed at AGRC. R

PHOTO: MARTIN DEE

*Prof. Kim Cheng works with chickens and quail that hold the key to a safer poultry supply.*

**"While flock uniformity is convenient for production and processing, the lack of genetic variation also leaves the door wide open for large-scale disease outbreaks."**

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**LEST WE FORGET**
*continued from page 1*

civilian life.

How can we do we do this? Ten years ago, in my role as a counselling psychologist at the Faculty of Education at UBC, I brought together veterans from the Korean and Second World Wars to talk to other soldiers about their experiences. These older veterans reported benefits from sharing their experiences with one another for the first time in their lives. They recommended that similar programs needed to be offered soon after veterans return from war. This provided the impetus for initiating the Veterans Transition Program (VTP), a group-based program designed to assist former members of the Canadian military in their transition back to civilian life. The program is supported by funds from the Royal Canadian Legion and has been running over the past nine years. More than 160 people have completed the program. This is the only program of its kind in Canada.

The VTP groups are co-facilitated by professionally trained group leaders who have extensive experience and understanding working within a military context. In this supportive and confidential group environment, the VTP provides information, skill acquisition and counseling interventions to help participants better understand their military experience and its impact on their lives. It also provides participants with the opportunity to re-enact critical events they experienced on the battlefield as a way dealing with and letting go of the trauma reactions they carry arising from their tours of duty and their readjustment to civilian life. Soldiers refer to this process as "dropping baggage' so that they can get on with their lives more successfully.

I remember the case of a soldier who was able to tell the group about his feelings of guilt after he had decided not to go in the field because he had a bad hangover. His buddy covered for him. That day his buddy was killed in a landmine explosion. By expressing his intense feelings of remorse and guilt he released the haunted memories and regrets that followed him home from the former Yugoslavia.

My research demonstrates that participants in the VTP have fewer trauma symptoms, gain personal confidence and have improved relationships with spouses, partners, children and families. Additionally, they develop a close working relationship with other soldiers in the group. This results in a strong and enduring sense of community and serves as a network of support among the participants following the program.

But you don't have to be a counseling psychologist to show support for these soldiers. There are three key ways we can all do our part for these returning soldiers. First of all, if you meet a soldier let him or her know that you appreciate what he or she did for this country. Second, try to be informed about the invisible wounds that occur, and how they are manifested, in order to be sensitive to how these returning veterans may be struggling. In particular, support them if they are considering seeking professional help by suggesting it is a normal part of recovery from the exposure of serving in the war. Finally, lobby your member of Parliament for more support and resources for those soldiers who return from war.

As we take the time to remember the many lives that were lost during the First and Second World Wars and the Korean War, let us not forget our commitment to our modern day soldiers who return traumatized by their hidden wounds.

*In March 2008, Prof. Marvin Westwood was awarded the Royal Canadian Legion's Highest Service Merit Award for a Civilian for Development of the Canadian Military and Veterans' Transition Program. This is the highest recognition award given to a non-military person. In June, the UBC Department of Counselling Psychology and Special Education received an award from the Royal Canadian Foundation in recognition of their support and contribution towards veterans through Prof. Westwood's Veteran's Transition Program.* R

## Annual UBC Remembrance Day Ceremony Nov. 11

UBC's annual Remembrance Day ceremony will be held on Tuesday, November 11, in the War Memorial Gym. With doors open at 10 a.m., all are welcome to attend to honour and remember all those who served in times of war, military conflict and peace. This year's event will commemorate in particular the 90th anniversary of the end of the First World War and the 60th anniversary of the Universal Declaration of Human Rights.

The ceremony, which often draws more than 1,000 people, will include music provided by the UBC School of Music, short readings and remarks. UBC Vice President, External, Legal and Community Relations, Stephen Owen, AMS President, Michael Duncan and Dr. John Blatherwick, former Chief Medical Health Officer for the Vancouver Coastal Health Authority and Honorary Colonel with the Canadian Forces Reserves, will be among this year's speakers.

For more information, visit:
www.ceremonies.ubc.ca/ceremonies/memorial/remembrance.html

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PHOTO: JODY JACOB

*UBC Okanagan researchers Bob Lalonde and Rebecca Tyson are trapping mountain pine beetles to better understand how they move through urban areas.*

# Pine beetles: out of the forest, into the city

**BY JODY JACOB**

Mountain pine beetles are sweeping through British Columbia's vast forests with highly destructive results, but their mass attacks don't stop at the edge of town.

Working in one of B.C.'s latest beetle battlegrounds – the city of Kelowna – UBC Okanagan biologist Bob Lalonde and mathematician Rebecca Tyson are combining their expertise to track how the mountain pine beetle spreads through an urban landscape during a mass infestation. Although extensive research has been done on the mountain pine beetle in a forest setting, there is very little information on how they work their way through a city, says Lalonde, Associate Professor of Biology and Physical Geography.

"Essentially, we have an empty playing field to conduct our research," says Lalonde. "This summer, a mammoth infestation of mountain pine beetles arrived in the City of Kelowna, creating an interesting opportunity to pursue the beetle's movements in an urban landscape from the beginning of an infestation. As you can imagine, many people, organizations and municipalities are interested in the project."

In May, Lalonde and Tyson, with the help of two summer students, strategically placed 44 pheromone traps – which attract and capture beetles – around the outskirts of Kelowna, as well as in the centre of the city.

"Basically we are trying to determine how the bark beetle enters the city, what direction they are entering the city from and how they move while in an urban environment," says Lalonde. "In addition, we plan to study the beetles themselves and look at factors such as how much energy is being burned in their flight path."

Checked every week until their removal in mid-August, the pheromone traps contained anywhere from zero to 200 mountain pine beetles, depending on location, as well as pine beetle predators, providing data that can help determine how quickly predators follow the bark beetles into the city.

The next step in the research is to analyze samples and data collected over the summer and use the information to create a mathematical model that identifies dispersal patterns of the beetle. A number of variables will be considered, such as location of the traps, number of beetles trapped, number and concentration of pine trees in the general area, biology of the beetles, and weather conditions.

"Mathematical modeling often reveals interesting behaviors that aren't anticipated," says Tyson, Assistant Professor of Mathematics, Statistics and Physics. "We are using beetle biology, spatial data and math in an attempt to understand in greater detail how the beetle is moving through an urban landscape, which may help us gain insight into the risk of infection for pine trees in certain areas of the city. This could result in possible solutions or preventative measures."

Although the mountain pine beetle infestation reached the city of Kelowna this summer, it will take a few months before the severity of the damage to the city's trees is known. Lalonde and Tyson are working with the City of Kelowna to identify the areas most affected, and will use that information as a variable in the mathematical model. Next year, they plan another summer of data collection, which may focus on determining how many beetles are originating from areas within Kelowna as a result of this year's infestation, as opposed to how many are still moving into the city.

> **"One thing we can say with confidence though is that, based on early results, it looks as though bark beetles enter a city from the outskirts inward, as opposed to dropping randomly from above, as some people had originally suggested."**

"We are really just at the beginning stages of the project," says Tyson. "There is still a lot of data to be collected and analyzed. One thing we can say with confidence though is that, based on early results, it looks as though bark beetles enter a city from the outskirts inward, as opposed to dropping randomly from above, as some people had originally suggested." ®

PETER WALL INSTITUTE FOR ADVANCED STUDIES

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2009–2010 Early Career Scholars Program

The Early Career Scholars Program is for full-time UBC faculty who are in the professorial ranks and at the early stage of their academic careers at UBC. Beginning with the 2009-2010 cohort, the Institute will appoint a single cohort of up to fourteen untenured Assistant and recently tenured Associate Professors each year. Assistant Professors within two years of their appointment as Assistant Professor at UBC and Associate Professors within two years of tenure and promotion at UBC are eligible. Each participant will receive an infrastructure budget of $6,000 and has access to a Project Fund of up to $1,000.

**MARCH 1, 2009**

Exploratory Workshop Grant

Exploratory Workshops provide funding for bringing together researchers from different disciplines at UBC with distinguished external experts to work jointly toward assessing the research possibilities in a new area. Typically, Exploratory Workshops will take place over a period of several days and have a mix of open and closed sessions. The amount of the award is up to $20,000.

*For more information, please visit our website at www.pwias.ubc.ca or call us at (604) 822-4782.*

# Finding the Lost: Ground penetrating radar helps First Nations honour ancestors

BY BASIL WAUGH

It may look like a lawnmower, but a new ground-penetrating radar (GPR) device is helping UBC researchers to find what is hiding deep underground.

Construction companies use the technology to find underground pipes and cables, but UBC archaeologists and B.C. First Nations recently used it to locate something much more sacred: missing loved ones.

At the Metro Vancouver-area Musqueam First Nation, numerous burials from the early 1900s, whose grave markers had been removed or lost due to weathering, were located using the GPR and several burials with questionable markers were confirmed.

Thanks to the GPR, there are now also more than 70 new markers at the Kwantlen First Nation's cemetery in Maple Ridge, B.C. Each one honours an ancestor whose headstone or metal cross had gone missing from theft, vandalism and car accidents from a nearby highway.

The GPR burial surveys are the first of their kind in North America, says UBC archaeology professor Andrew Martindale. What's more, the technology helped researchers locate these First Nations' ancestors without lifting a shovel. GPR uses software to generate visual representations of underground objects based on radio signals that it sends and receives.

"Knowing where our loved ones are means a great deal for our people," says Kwantlen Chief Marilyn Gabriel. "It was a very powerful moment when we first saw all those new markers above where are our ancestors lay."

Chief Gabriel says the Kwantlen plan to replace the temporary markers with a permanent monument and are consulting with spiritual and cultural advisors. "In my heart, that will complete the work," says Chief Gabriel.

"This was very important research," said Delbert Guerin, Musqueam Councillor and Elder. "It is an opportunity to teach our youth about the history of our people and our land."

In 2007, UBC and the Musqueam received $70,000 from UBC's Teaching and Learning Enhancement Fund (TLEF) to purchase the GPR device. It was piloted this past summer at an undergraduate field school created by UBC and the Musqueam.

"The field school enables UBC and the Musqueam to develop research projects that give students practical fieldwork experience and address the research interests of the Musqueam people," says Martindale.

Martindale says the GPR burial surveys were made possible through the unique strengths of the Musqueam, the Kwantlen and UBC's Laboratory of Archaeology in the Dept. of Anthropology.

"Archaeologists don't typically work with contemporary burial sites, so this reminded us of the sacredness of our ties to the past," says Martindale. "Having Musqueam and Kwantlen elders there to guide our work was as important as our archaeological expertise."

UBC has an ongoing relationship with the Musqueam that goes back to the 1940s, Martindale adds. That was when UBC's first archaeologist Charles Borden and a young Musqueum band member, Andrew Charles, initiated collaborative research between the two communities.

Steve Daniel, a UBC archaeology graduate student and head statistician for the Canadian Football League, says he "learned more in six weeks than in any book" during his fieldwork experience on Kwantlen territory.

Daniel says GPR, which has a subterranean range of five metres, is an important archaeological tool, especially in urban areas. "It allows you to see what's down there, because you can't go around digging up city streets," he says, noting that archaeological digs are expensive and destructive. "And if you do excavate, this helps you to be exact as possible, saving time and money."

Daniel, who recently completed his undergraduate studies at UBC, credits the GPR, his professors and his experiences with the Musqueam and Kwantlen for his decision to pursue graduate research.

"I grew up in South Vancouver and that's what I want to investigate – that's where my passion is," he says. "The area is rich in 'European settler history' and 'First Nations time immemorial history.' Trying to match them up is pretty interesting to me."

For Musqueam Richard Sparrow, who helped conduct the GPR surveys, the projects had special meaning.

"As a Musqueam myself, finding unmarked graves was very important to me," said the 27-year-old, who trained students on how to use GPR technology. "I also think our ancestors would have really appreciated our efforts. That is what I kept thinking while we did the work." R

PHOTO: MARTIN DEE

*Steve Daniel, a UBC archaeology graduate student, used radar technology to locate burials in B.C. First Nation cemeteries.*

THE UBC STAFF PENSION PLAN is currently holding an election for two directors, who upon election, will serve four-year terms on the Pension Board. Election packages were sent to members on Friday, October 31, 2008. The deadline for casting ballots is Thursday, November 27, 2008. If you have not yet received your election package, you may contact the Pension Office at (604)-822-8100. Election results will be announced on the SPP website: *www.pensions.ubc.ca/staff* on Friday, December 5, 2008.

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FACULTY OF APPLIED SCIENCE
**UBC KILLAM TEACHING PRIZE**

The University is again recognizing excellence in teaching through the awarding of teaching prizes to faculty members. Three prize winners from the Faculty of Applied Science will be selected for 2009.

**Eligibility:** Open to full-time tenure-track faculty or a sessional lecturer with at least half-time teaching in Architecture, Engineering or Nursing who have five or more years of teaching experience at UBC.

**Criteria:** Sustained teaching accomplishments at all levels at UBC, focusing on faculty members who have demonstrated that they are able to motivate students and are responsive to students' intellectual needs, or have developed innovative course materials for laboratory or classroom delivery.

**Nomination Process:** Students, alumni or faculty members may nominate candidates. Student nomination letters should include at least five student signatures. Letters of nomination and supporting documents should be sent directly to:
**Dean's Office, Faculty of Applied Science**
The University of British Columbia
5000-2332 Main Mall, Vancouver, BC, V6T 1Z4
Attention: Laura Vigorito
**Nomination Deadline:** November 28, 2008

*For further information, please contact the Dean's Office, Faculty of Applied Science (Laura Vigorito, e-mail lvigorito@apsc.ubc.ca; tel: 604-822-6776), your Department or School office, or the Killam Teaching Prize Committee Chair, Luis Linares.*

THE UNIVERSITY OF BRITISH COLUMBIA

FACULTY OF ARTS
**UBC KILLAM TEACHING PRIZES**

Once again the University is recognizing excellence in teaching through the awarding of prizes to faculty members. Up to six (6) prize winners will be selected in the Faculty of Arts for 2009.

**Eligibility:** Eligibility is open to faculty who have three or more years of teaching at UBC. The three years include 2008 – 2009.

**Criteria:** The awards will recognize distinguished teaching at all levels; introductory, advanced, graduate courses, graduate supervision, and any combination of levels.

**Nomination Process:** Members of faculty, students, or alumni may suggest candidates to the Head of the Department, the Director of the School, or Chair of the Program in which the nominee teaches. These suggestions should be in writing and signed by one or more students, alumni or faculty, and they should include a very brief statement of the basis for the nomination. You may write a letter of nomination or pick up a form from the Office of the Dean, Faculty of Arts in Buchanan A201.

**Deadline:** 4:00 p.m. on January 15, 2009. Submit nominations to the Department, School or Program Office in which the nominee teaches.

Winners will be announced in the Spring, and they will be identified during Spring convocation in May.

*For further information about these awards contact either your Department, School or Program office, or Dr. Dominic McIver Lopes, Associate Dean of Arts at (604) 822-6703.*

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*Indel Therapeutics CEO Malcome Kendall and Prof. Neil Reiner have a big idea for a new class of antimicrobial drugs.*

# New antibiotics outsmart evolving bacteria

BY CATHERINE LOIACONO

It started with the discovery of a hairpin loop in an essential protein found in both humans and parasites.

Now a research team at the University of British Columbia, in collaboration with a recently launched UBC spinoff company, Indel Therapeutics Inc., is developing new classes of antimicrobial drugs for difficult-to-treat and hospital-acquired infections. The spinoff is one of three overseen this year by UBC's University-Industry Liaison Office.

Historically, antimicrobial drug development, which includes antibiotics, antifungal, and antiviral therapies, targeted the proteins in pathogens that are not found in humans, allowing humans to combat these disease-causing bugs.

Indel Therapeutics' approach, on the other hand, targets essential proteins that are found in pathogen and in humans. These proteins perform critical housekeeping chores that keep cells in all species alive and functioning.

"The high percentage of similarities between essential proteins in humans and pathogens has historically left this type of research off-limits," says Dr. Neil Reiner, professor and head of UBC's Division of Infectious Diseases in the Faculty of Medicine. "We discovered that while these proteins are found in both the pathogen and humans, there are subtle differences called insertions or deletions or "indels" that allow targeting the bug version of the protein, without affecting the human counterpart protein," says Reiner. "For example, a critical protein in the pathogen that causes Leishmaniasis (a disease prevalent in the developing world) is missing a hairpin loop sequence that is present in the same essential human protein, creating a pocket we can target with a small molecule drug."

The new classes of antimicrobials that Indel Therapeutics is developing will selectively bind in the deleted region but cannot bind in the corresponding human protein. In doing so, the pathogen dies because the essential protein is blocked. Targeting essential proteins in this way is a new mechanism for attacking these disease-causing bugs.

"One of the significant benefits of this new class of antimicrobials is it will be difficult for microbial resistance to evolve," says Reiner. "The explosion in antibiotic-resistant bacteria continues to drain our medical chest of antibiotics. These pathogens can undergo as many as 500, 000 generations for every one of ours. This gives them a great evolutionary advantage to mutate and become resistant to antibiotics. As a result, a third of all deaths are because of infection."

Indel Therapeutics' antimicrobials drugs will target a wide range of important pathogens including; methicillin-resistant Staphylococcus aureus (MRSA), Streptococcus, E.coli, Salmonella, Malaria, Leishmaniasis, African Sleeping Sickness and others.

The company anticipates that it will take three years before the discovery is introduced into human clinical trials.

"The rapid evolution of drug-resistant pathogens will continue to drive the need for new antibiotics with novel mechanism of action," says Malcolm Kendall, CEO, Indel Therapeutics. "Our approach is unique in that it targets – with great specificity – critically essential protein within pathogens, and this targeting strategy should confer an advantage against the emergence of resistance."

According to Kendall, the number of new antibiotics approved by the Food and Drug Administration (F.D.A.) has declined 75 per cent over the last 24 years with only 4 antibiotics being approved in the last few years and only three novel classes of antibiotics being introduced in more than 40 years. The cost of hospital-acquired infections is as much as $27.5 billion in additional hospital costs to the U.S. healthcare system. ■

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## UBC Spins Off New Companies

The UBC University-Industry Liaison Office has overseen the creation of a three new spinoff companies so far this year.

In addition to Indel, Vida Therapeutics has been established around the work of Dr. David Granville to focus on the discovery and development of first-in-class drugs for the treatment of age-related degenerative processes, cardiovascular disease and other inflammatory conditions.

Boreal Genomics, based on the discoveries of Drs. Andre Marziali and Lorne Whitehead, has a novel mechanism that purifies DNA so that it is possible to analyze samples that would previously have been deemed contaminated. This technology has a wide range of potential applications as a medical device, and as a research tool in areas such as forensics and archaeology.


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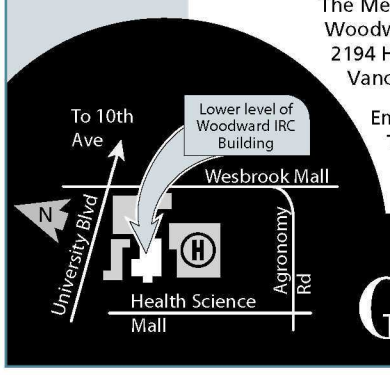


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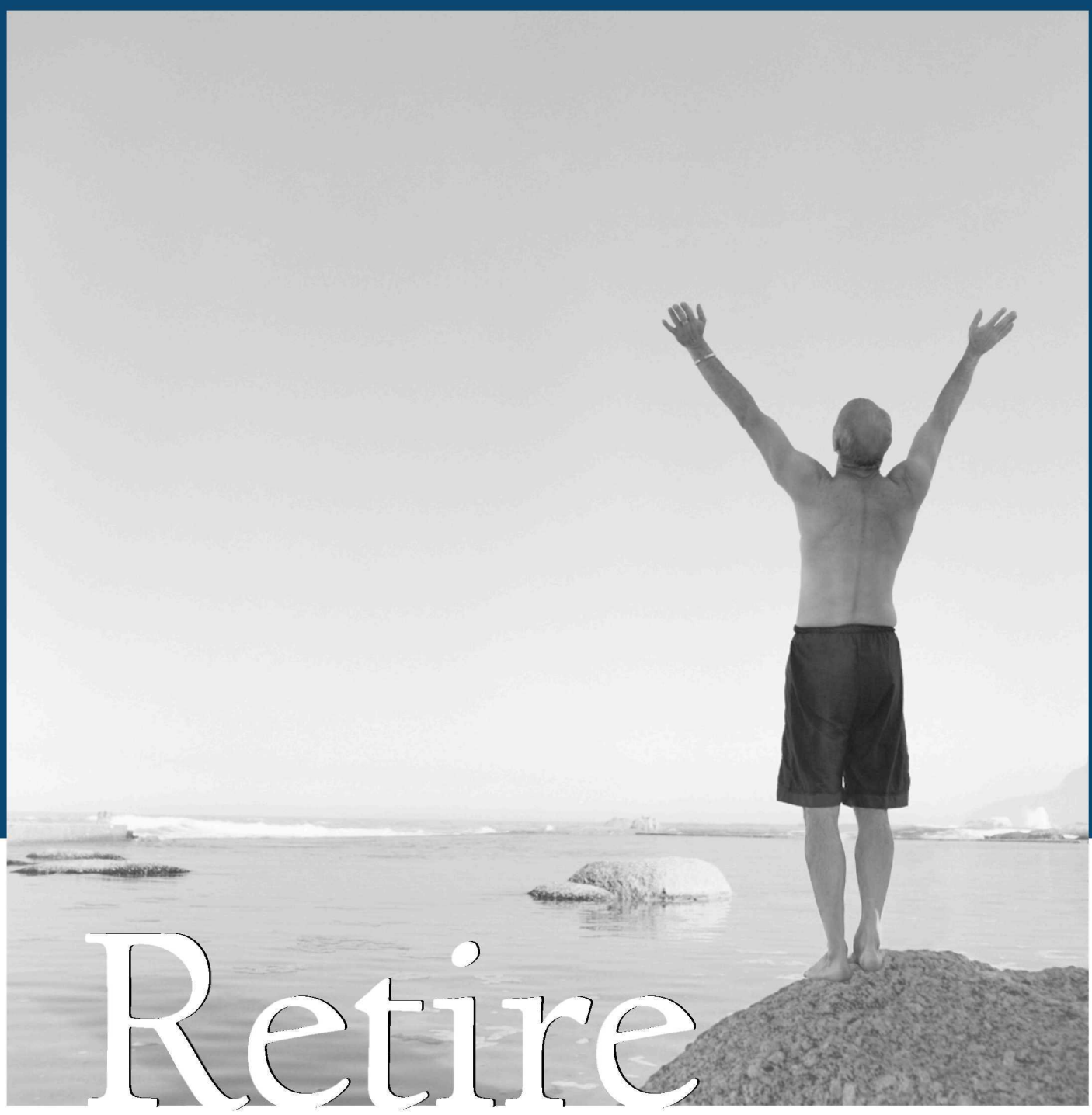


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