Re-Wiring the Brain

A new Virtual Reality Therapy tool being developed at UBC may provide a non-drug alternative to stroke and Parkinson’s patients. by HILARY THOMSON

It may look like a primitive video game, but this virtual environment is a sophisticated tool to help the brain re-wire itself after damage from stroke or Parkinson’s disease.

Prof. Martin McKeeown, of the Pacific Parkinson’s Research Centre at UBC Hospital, and colleagues are developing a virtual stimuli exercise that offers patients a non-drug-based therapy to help recover motor ability.

“The therapy is the only one of its kind in North America,” says McKeeown, who is a member of the Brain Research Centre and an investigator with the Vancouver Coastal Health Research Institute. “We’re looking at non-pharmacological treatments by developing optimal sensory environments to help rehabilitate patients.”

The virtual reality (VR) therapy may be available to patients within five years.

A physician with a degree in engineering, McKeeown has been working with Prof. Sid Fels of the Faculty of Applied Science to create the VR experiment at UBC. Before continued on page 6

VR Therapy: How it Works

The therapy involves 15 electrode patches, each about five cm. in diameter, applied to the patient’s arms and shoulders. The electrodes record electrical activity in the muscles, in particular, communication between groups of muscles.

The patient observes a monitor where coloured balls appear in 3-D and seem to fly toward the subject. The participant is instructed to use their weakened arm to reach out as if to catch the ball. They may be instructed to try to catch all balls or to ignore all but one designated ball.

Dr. Martin McKeeown has created a colourful, 3-D virtual environment that stimulates brain cell activity to help patients recover motor ability.

UBC Student Enlists Ugandan Girls in Education Research by LORRAINE CHAN

Armed with two laptop computers, a digital camera and compass, UBC education student Shelley Jones helped Ugandan girls voice their ideas on literacy, gender and education.

The important thing to me is giving these girls a voice.... They helped me to understand the culture and context of life for women and girls in a rural Ugandan environment.,” says Jones. “Typically, NGOs parachute into developing countries and the students explore such issues as barriers to paid work for women and the girls’ expectations about love and marriage.

“The girls were my co-researchers,” says Jones. “The important thing to me is giving these girls a voice, which has been missing from research work in developing countries. They helped me to understand the culture and context of life for women and girls in a rural Ugandan environment.”

They created a music video and documented Ugandan life through photographs. To operate her digital camera and laptop, Jones relied on the solar panels of the village library and the car battery she purchased as a power source.

One of their most successful photography projects involved a field trip to the nearby town of Masaka, where the chief of police gave the group an impromptu tour and interview.

“One of the realities girls and women face is that polygamy is still common in Uganda. Within large families, boys are seen as future breadwinners and are given priority for spending scarce education dollars. However, the girls also realize schooling is the only way out of the backbreaking toil their mothers endure.”

“Why they know education is the most important thing in their lives,” says Jones. “Some of them walk two to three hours to attend school.”

Jones says of the girls live in desperate poverty. Their families depend on subsistence-level farming supplemented by occasional labouring jobs for the men and sales of garden produce or crafts by the women.

“I was speechless at how little they had,” says Jones. “They had no money to buy kerosene so after sunset there was no light to do their homework.”

Jones says that while elementary education is free, Ugandan students have to pay school fees once they get to the equivalent of grade 8. These fees can amount to about $80 US per year, whereas a typical family in the area may earn $1 US per day or less.

Some girls were desperate enough to sell their bodies to get an education.

“I was really surprised they admitted it,” says Jones, who conducted a confidential survey among 13 girls.

Over 45 per cent said they would consider prostitution in order to continue on page 5
IN THE NEWS

Highlights of UBC Media Coverage in November 2005. Compiled by Basil Waugh

UBC’s Team Snowstar (left to right: Ashly Cook, Andrew Morrison, Damon Hirt, Simon Hadings, Steve Jones, and Eric Ma) design a “space elevator,” a system that delivers cargo from Earth to space along miles of super-strong tether, using only light as a power source and at a fraction of the cost of a traditional space launch. Of the many university and corporate teams that entered NASA’s recent competition, Team Snowstar, a student team from UBC, was voted most likely to succeed in 2006. The team was profiled in major U.S. media outlets including CNN, USA Today and MSNBC.

TECHNOLOGY COULD TRANSFORM URBAN LANDSCAPE FOR DISABLED UBC undergrads have discovered a technology that could help people with disabilities to control crossings sidewalks and household electronics using everyday cellular phones.

UBC undergrads have discovered a Bluetooth-enabled transmitters, the student project already exist, so installing them into public facilities wouldn’t require a lot of money or time — all that is required is industry and government support.

UBC’s Team Snowstar (left to right: Ashly Cook, Andrew Morrison, Damon Hirt, Simon Hadings, Steve Jones, and Eric Ma) design a “space elevator,” a system that delivers cargo from Earth to space along miles of super-strong tether, using only light as a power source and at a fraction of the cost of a traditional space launch. Of the many university and corporate teams that entered NASA’s recent competition, Team Snowstar, a student team from UBC, was voted most likely to succeed in 2006. The team was profiled in major U.S. media outlets including CNN, USA Today and MSNBC.

DEAR EDITOR

The following letter was received in response to the call for comments about Policy #130 (M anagement of W indless Networ), printed in the November edition of UBC Reports.

Dear editor:

I write to express my dissatisfaction in the Review Committee of Policy 130. Clearly listed in “Who Should Read This Policy” section of the policy are “Students in UBC housing,” but there are no student representatives on the review committee. UBC should make greater efforts to consult students on issues that UBC thinks effect students.

Kim Lam
Department of Electrical and Computer Engineering
University of British Columbia
2356 Main Mall
Vancouver, BC, Canada V6T 1Z4

UBC Reports

Director, Public Affairs
Scott Macrae
scott.macrae@ubc.ca
Design Director
Chris Dahl
christopher.dahl@ubc.ca
Editor
Randy Schmidt
randy.schmidt@ubc.ca
Contributors
Lorraine Chan
lorri.chan@ubc.ca
Randy Schmidt
randy.schmidt@ubc.ca
Sharmeen Thakur
sharmeen.thakur@ubc.ca
Morgan Erhardt
morgan.erhardt@ubc.ca
Principal Photography
Martin Cowley
martin.cowley@ubc.ca
Advertising
Sarah Welsh
public.affairs@ubc.ca

UBC Reports is published monthly by the UBC Public Affairs Office
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Latters (300 words or less) must be signed and include an address and phone number for verification. Submit letters to: The Editor, UBC Reports, UBC Public Affairs Office (address above); by fax to 604-822-2684; or by e-mail to randy.schmidt@ubc.ca or call UBC Newsline (604-822-6397).

NEXIE ISSUE JANUARY 9, 2006

NEWS

Still Time to Donate!

As the 2005 UBC United Way Campaign draws to a close this month, donors and volunteers are continuing their support. “With over $400,000 raised we have achieved 76% of our fundraising goal to support social programs and services in the Lower Mainland,” notes332

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Literature

Van Camp's first novel, Douglas and McIntyre published his peers. A book he wanted to read and one Van Camp felt compelled to write

Vancouver.

year-olds on the Musqueam writing workshop for 15-to 29-year-olds on the M usqueam Reserve in south Vancouver.

Van Camp is supporting his students through a journey he himself took at the age of 19. As a member of the Dogrib Nation growing up in the Northwest Territories, Van Camp felt compelled to write a book he wanted to read and one that showed his life and the life of his peers.

Five years later in 1996, Douglas and Mc tilted Van Camp's first novel, The Bear's Peace. The powerful coming-of-

together in the Northwest Territories. Van Camp felt compelled to write a book he wanted to read and one that showed his life and the life of his peers.

Van Camp focuses on several fac-
tors why Aboriginal literature is thriving. “We’re the second generation writing in English. We’re also the second generation free from residential schools.”

Technology has made publishing

Van Camp's first novel, Douglas and

Van Camp is in a unique posi-
tion to teach his students. Since 2001, he has been leading weekly workshops at UBC's First Nations House of Learning for Aboriginal second- and third-year students. He also teaches a storytelling and writing workshop for 15-to 29-year-olds on the M usqueam Reserve in south Vancouver.

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dents through a journey he himself took at the age of 19. As a member of the Dogrib Nation growing up in the Northwest Territories, Van Camp felt compelled to write a book he wanted to read and one that showed his life and the life of his peers.

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Artisanal Miners Risk Mercury Poisoning

Student works for healthier mining technologies. BY BRIAN LIN

When Cody Hopkins witnessed four Indonesian artisanal gold miners narrowly escape a landslide last summer, it hit home what a big difference he could make with a degree in mining engineering.

Hopkins, a fourth-year student in UBC’s Dept. of Mining Engineering, spent three weeks in Indonesia with the Global Mercury Project (GMP), a UN-funded project aimed at providing gold miners in developing countries with healthier, more efficient mining technologies.

“We are currently witnessing the biggest gold rush the world has ever seen,” says UBC Mining Engineering Assoc. Prof. Marcello Veiga, the world’s leading researcher in mercury contamination from artisanal mining, and Chief Technical Advisor of the GMP. “In more than 50 countries, there are 35 million people working as artisanal gold miners, including four million women and two million children.” As a result of artisanal miners using mercury to extract minute quantities of gold — too little to make economic sense for large scale mining companies, but enough to put food on the table for poverty-stricken rural communities — more than 1,000 tonnes of mercury are released back into the environment each year.

The powerful poison damages the brain and kidneys when ingested or inhaled through the food chain. It is especially dangerous for developing babies and small children, many of whom work side-by-side with women artisanal miners.

Hopkins took a third-year course inspired by Prof. Veiga’s work — he applied to join the team last summer to collect data to help build a case for the severity of the situation.

“I was talking to some miners and all of a sudden there was this loud thump and I saw the entire top section of the slope tumble to the bottom, almost falling on one of the miners. That was when it really hit me what we’re doing here can really make a difference.”

As a result of artisanal miners narrowly escaping a landslide, it hit home what a big difference Hopkins could make with a degree in mining engineering.

Ironically, most mercury used by artisanal miners is recycled mercury imported from the developed world.

Most sluices in the area were lined with carpets or other cheap magnetic materials, but enough to put food on the table for poverty-stricken rural communities — more than 50 countries, there are 35 million people working as artisanal gold miners, including four million women and two million children.” As a result of artisanal miners using mercury to extract minute quantities of gold — too little to make economic sense for large scale mining companies, but enough to put food on the table for poverty-stricken rural communities — more than 1,000 tonnes of mercury are released back into the environment each year.

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As a result of artisanal miners narrowly escaping a landslide, it hit home what a big difference Hopkins could make with a degree in mining engineering.
When UBC graduate student Shelley Jones, 43, traveled to south central Uganda last August to research her education thesis, she had no idea she’d be returning a mom.

But early into her first term of teaching high school in Masaka District, Jones began taking care of a 16-month-old girl who was extremely ill.

“I had gone to visit a nearby home and saw this little baby,” says Jones. “I couldn’t imagine my life without her,” says UBC education student Shelley Jones of her adopted Ugandan daughter, Shakira, now almost three.

The child, Shakira, had been orphaned and was left in the care of a grandfather and other relatives. “They were already quite burdened with other children to look after. They had very little.”

Soon, Jones began to look in on Shakira twice a day. Before going to work and on the way home, she would take the baby back to her house to feed and bathe her. “After a couple of weeks, I began taking her to school with me and keeping her with me all day,” says Jones. “And then it just made sense for her to come live with me.”

Because Shakira had not been breastfed, the doctors told Jones that she showed all the classic symptoms of extreme malnutrition. As well, the girl suffered from malaria and other signs of ill health. Jones carefully fed her easy foods such as scrambled eggs, milk, fruit, vegetables, and Shakira’s favourite, pasta, along with a cocktail of vitamin serums and prescription medication.

“She had this fiery determination to live,” says Jones, “That’s what really helped her to make a full recovery.”

After nine months, Jones made the adoption official. And when she returned to Vancouver this August, Shakira — now almost three — was her irrepressible seatmate on the flight home.

“Shakira has been paying out of her pocket the school fees for several girls. She has also has launched a Ugandan girls’ education fundraising campaign through YouLead, a development and youth global citizenship organization at UBC. Their camp will kick off with a Dec. 15 fundraiser event. To be held at UBC International House, the 5 p.m. to 7 p.m. event will feature African music, drummers, a silent auction and door prizes.

As well, YouLead is working with a Ugandan village to build a facility by next spring that will house visiting researchers and community projects such as the one underway in the south central area of Uganda. Jones says this is a recognized need.

Jones’ study has won funding from the Social Sciences and Humanities Research Council (SSHRC) and the International Development Research Council (IDRC). For details about YouLead and the December 15 YouLead fundraiser event, visit: http://www.youlead.org.

For more information about Jones’ research: http://www.interchange.ubc.ca/jones.

**Voice About Education continued from page 1**

to raise school fees,” says Jones. “And of the girls who completed the questionnaire, 100 per cent admitted they knew of girls who had engaged in sex with their teachers. Jones says this is a recognized and widespread problem in Uganda. Girls slept with teachers out of fear that they could be punished for refusing, or in hope they could earn tuition.

Jones returned to Vancouver this August, but remains close to the students and villagers.

“I don’t go a week without a phone call to find out how they’re all doing,” says Jones.

“I’m committed to those girls. They’re at a critical juncture. 17, 18, 19-year-olds is when they’ll be making lots of decisions that will affect them for the rest of their lives.”

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Science Co-op Launches Student on Global Journey

By Brian Lin

When UBC biophysics student Lars Jungclaus signed up for the Science Co-op Program, he never expected it to contribute to a better understanding of his family heritage, Islam and Korean culture.

What began as an eight-month stint in the M-Structure Laboratory at the University of Würzburg in Germany, however, turned into a series of transformative experiences that the 24-year-old honours student says is far beyond his time and efforts.

“I’m half German, so the opportunity to brush up on the language and spend time with relatives was a big draw,” says Jungclaus, who studied the performance of semi-conductor lasers being developed at the world-renowned lab for potential applications in data transmission.

“I also got to travel around much of Europe on the weekends, and once I caught the travel bug, it was kind of hard to stop.”

With his appetite for globetrotting whetted at Würzburg, Jungclaus took a year off school and joined Canada World Youth, an organization founded by former of Würzburg senator Jacques H. Dietz. “The program pairs Canadian youth with peers from a developing country — in our case, Indonesia — and we spend seven months volunteering in a rural area of each country,” says Jungclaus.

Despite finding some striking similarities to Canadian youth including a passion for Western television and music, Jungclaus was moved by the devotion to Islam shown by their Indonesian counterparts, especially against the backdrop of small-town B.C., where the two dozen Canadian and Indonesian youth spent the first half of the program.

“Part of the time we spent in Fernie, B.C., happened to be Ramadan,” says Jungclaus. “Some of the Canadian participants, including myself, decided to observe the fast in support of our Muslim partners. It was the first time many of us had direct exposure to Islam.”

It was Jungclaus’s turn to stand out when the group arrived in a small village on the island of Borneo, population 100. At six-foot, five-inches tall, Jungclaus says he felt like a bound atonement for locals as he heaved above most of the villagers, helping plant trees and building public toilets.

“Most of them are quite poor and make a living from selling fruit from their plantations,” says Jungclaus. “But they seem very content with life and derive happiness from simply putting food on the table — things we take for granted.”

Rounding up the globetrotting, Jungclaus completed one more Science Co-op work term in Korea, designing and testing a solar lighting system in a joint project with the Korea Institute of Energy Research.

“I was impressed with the strong work ethic of my Korean colleagues,” says Jungclaus. “They work long hours, then they go out after work and have a good time. The team bonding was probably the strongest I’ve seen anywhere.”

Jungclaus credits his co-op experience for exposing him to a wide range of professional and academic environments, and allows Indonesian counterparts a chance to see firsthand how one could apply knowledge to real life problems. “I definitely come away with a sense that I know what’s waiting for me beyond university — whether it’s graduate school or an industry career.”

Calling All UBC Authors!

Are you the author of a book, or the creator of a video, cd, cd-rom, or electronic book published between January 2005 and December 2005?

If so, we would like to hear from you so that you can be included in the 16th Annual Reception

| NEWS TV | RADIO |

UBC Public Affairs has opened both a radio and TV studio on campus where you can conduct live interviews with local, national and international media outlets. To learn more about being a UBC expert, call us at 604-822-2064 and visit our web site at www.publicrelaffairs.ubc.ca/experts/signup

Re-Wiring the Brain

Dr. M. Okew and colleagues [l-r] Joyce Chang, Dr. Yuqing Wei, G raeme M.Craig and Liast E. Iegeneram.

M. Okew arrived on campus in 2003, he worked on the therapy at Duke University in North Carolina.

The therapy builds on previous research that showed stimulating simultaneous electrical signals between brain cells, including those brain cells that ultimately control muscles necessary for movement.

The only problem was that giving stimulating pulses to stroke patients couldn’t be done fast enough. Small electrical signals cannot be transmitted through neurons at the same time.

We started looking for ways to stimulate release of neurotransmitters without the use of drugs,” says M. Okew. “A virtual solution seemed perfect — patients could react to stimuli in a safe environment and we could monitor precisely the electrical activity of muscles.”

The intensity of the stimuli causes the brain to spike production of neurotransmitters. These chemical bursts allow strong electrical signals to travel through damaged nerves.

The beauty of the VR environment is that we can stimulate to electrical activity from muscle groups to learn precisely how stimuli are affecting movement,” says M. Okew. In collaboration with Prof. Jane Wang of UBC’s Dept. of Electrical and Computer Engineering, M. Okew is also using the experiment to develop an accurate means of measuring brain activity in brain-injured patients, a long-standing challenge in rehabilitation science.

M. Okew, his colleagues from Duke University, and Dr. Yuqing Wei, a visiting neurologist from China, have shown the immediate positive effects of the stimuli in 20 stroke patients and 20 control sub-

UBC Science Co-op Program

Established in 1980, the UBC Science Co-op Program places approximately 1,000 students in co-op jobs each year with industry employers and research institutions in Canada and in more than 15 countries around the world.

Billy Lau, a fifth-year Engineering Physics student who spent two co-op terms at the University of Würzburg in Germany, says the experience helped him develop technical skills while reinforcing knowledge gained from coursework. “You can definitely notice the difference in fifth-year lab courses. You just ‘get it’ more,” says Lau.

Nearly one per cent of co-op graduates are employed within two months of graduation, versus 60 per cent for non-co-op graduates.

Seventy per cent of co-op graduates are in jobs which meet their salary expectations, compared to 46 per cent for non-co-op graduates.

For more information, visit www.sciencecoop.ubc.ca.

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Science Co-op launches Student on Global Journey

by Brian Lin

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“I’m half German, so the opportunity to brush up on the language and spend time with relatives was a big draw,” says Jungclaus, who studied the performance of semi-conductor lasers being developed at the world-renowned lab for potential applications in data transmission.

“I also got to travel around much of Europe on the weekends, and once I caught the travel bug, it was kind of hard to stop.”

With his appetite for globetrotting whetted at Würzburg, Jungclaus took a year off school and joined Canada World Youth, an organization founded by former of Würzburg senator Jacques H. Dietz. “The program pairs Canadian youth with peers from a developing country — in our case, Indonesia — and we spend seven months volunteering in a rural area of each country,” says Jungclaus.

Despite finding some striking similarities to Canadian youth including a passion for Western television and music, Jungclaus was moved by the devotion to Islam shown by their Indonesian counterparts, especially against the backdrop of small-town B.C., where the two dozen Canadian and Indonesian youth spent the first half of the program.

“Part of the time we spent in Fernie, B.C., happened to be Ramadan,” says Jungclaus. “Some of the Canadian participants, including myself, decided to observe the fast in support of our Muslim partners. It was the first time many of us had direct exposure to Islam.”

It was Jungclaus’s turn to stand out when the group arrived in a small village on the island of Borneo, population 100. At six-foot, five-inches tall, Jungclaus says he felt like a bound atonement for locals as he heaved above most of the villagers, helping plant trees and building public toilets.

“Most of them are quite poor and make a living from selling fruit from their plantations,” says Jungclaus. “But they seem very content with life and derive happiness from simply putting food on the table — things we take for granted.”

Rounding up the globetrotting, Jungclaus completed one more Science Co-op work term in Korea, designing and testing a solar lighting system in a joint project with the Korea Institute of Energy Research.

“I was impressed with the strong work ethic of my Korean colleagues,” says Jungclaus. “They work long hours, then they go out after work and have a good time. The team bonding was probably the strongest I’ve seen anywhere.”

Jungclaus credits his co-op experience for exposing him to a wide range of professional and academic environments, and allows Indonesian counterparts a chance to see firsthand how one could apply knowledge to real life problems. “I definitely come away with a sense that I know what’s waiting for me beyond university — whether it’s graduate school or an industry career.”

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Health Researchers Explore Communication Technologies to Deliver Care

BY HILARY THOMSON

When a child has a brain hemorrhage, a city doctor consults with a neurosurgeon — and fast. But what if the child lives in an isolated South Asian village and the closest neurosurgeon is hundreds of kilometres away?

Telemedicine, or e-health, could be the answer, says Dr. Kendall Ho, who along with other committee members is working with WHO to bring e-health to underserved areas.

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“Telemedicine will completely change health care,” says Ho. “It gives us uncharted opportunities to spread medical knowledge to the world.”

Members of the committee include health sciences representatives from Hong Kong University and University of Queensland in Australia. For the past three years, they have been looking at how telemedicine — health-related activities across distance that use computers and videoconferencing — can improve global health. They envision technology can play a substantial role to enable and facilitate improved access of care in remote areas that lack facilities and health-care personnel. The emerging field is commonly known as e-health.

Ho says about 10 per cent of the world’s population has access to 90 per cent of the world’s health-care resources, according to World Health Organization (WHO) data. In addition, approximately seven million children under the age of five die each year in developing countries, from conditions that could have been prevented if there was sufficient knowledge and access to existing, cheap methods of treatment.

“With the aid of e-health, we can be instrumental in preventing unnecessary deaths among children,” says Ho, who along with other committee members works in collaboration with WHO to use information and communication technology in clinical work, health training and administration.

In July, a UBC medical student, along with two students from the University of Hong Kong, went to a Sri Lankan hospital to explore telemedicine opportunities. Working with local health-care professionals, the students identified clinical cases that might benefit from online consultation with health-care practitioners in U21 member countries. They used digital cameras and the Internet to document and communicate details of patients’ conditions.

“Computers were non-existent in the hospital,” says Ame Huang, currently a third-year UBC med stu- dent. “Electronic reports of lab results — things we consider standard practice here — just weren’t available. The whole experience cemented my belief that to provide the best care, physicians must be part of a bigger structure that requires systemic approaches, such as IT resources.”

The U-21 committee is now planning an e-health project in Papua New Guinea.

“Our goal is to build health-care capacity among a country’s own citizens,” says Ho. “A health is interdependent, a support, not replacement, for local resources.

“I think e-health would be especially useful in providing distance specialist services, says Ho. “Neurological consultations and mental health assessments are possible via video-conferencing, and we can confer with local practitioners by e-mail, and personal digital assistants offer improved access to specialized information to help doctors with their clinical decisions.

E health professionals in under-served and isolated locations could be electronically linked, and practitioners using e-health technology could provide effective global health surveillance of widely communicable diseases like SARS.

But there are significant challenges to implementing e-health innovations.

An immediate problem is access to technology and user skill levels. In addition, rapid evolution of technologies may hinder long-term use of today’s hardware and software, which often become obsolete soon after introduction. Also, there is currently little research-based evidence to support telemedicine’s cost-effectiveness and return on investment relative to traditional services.

“While we’re trying to do now is to conduct thoughtful evaluation to generate evidence about the sustainability of telemedicine,” says Ho. “The time is right to do this work. The technology is there, public awareness of global health issues is there and synergy between U21 institutions and WHO can kick start initiatives and investment in communication technologies.”

Health science students and faculty members interested in becoming involved in a health project can contact Ho at kho@cpdkt.ubc.ca or at www.cpdkt.ubc.ca.

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Prepare to be inspired by the views from your terrace that overlook a sea of blood flow to the brain or rupture of blood vessels in the brain. The fourth leading cause of death in Canada, about 15,000 people die from stroke each year and about 300,000 Canadians live with the effects of stroke.

C-investigators include medical student Livija Eigenermann, from Holland, Prof. Wang’s master’s student Joyce Chang, and research assistant Graeme M. Ogilvie. Lab space has been provided by UBC’s MRdta and Graphics Interdisciplinary Centre (MACIC).
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Clay Gillespie, BBA, CFA, EFF
Head President & Portfolio Manager
gillespie@rogersgroup.com

Jim Rogers, BA, MHA, CLU, EFF
Chairman
jrogers@rogersgroup.com

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