

UBC REPORTS

3 SHUT DOWN DISEASES 4 PARALLEL WORLDS 6 DIABETES 7 FOREST BIOREFINERY 9 ANIMAL EMOTIONS II SEGWAYS



A New Science of Faith: Busting the “Secularization Myth”



Ara Norenzayan, a social psychologist, studies what causes people to commit good or evil in the name of God.

By Asst. Prof. Ara Norenzayan,
Dept. of Psychology,
Faculty of Arts

Belief in God has often been blamed for much of the violence in the world, and many see secularization as a safeguard against religious intolerance and violence. Yet we have found no empirical support for the contention that believing in God in and of itself promotes hatred and violence, although dogmatic belief and boundary-setting religious tendencies, like their secular counterparts, do.

In the last several years, my research has investigated religion as a group of interrelated behaviours deeply rooted in basic human needs and ordinary mental dispositions, transmitted culturally across minds, and recurrent across societies and historical time. As a social psychologist, I'm interested in how religious beliefs are formed in the mind, what motivates people to arrive at and hold these beliefs, and when these beliefs encourage costly and apparently irrational behaviours, such as violent martyrdom, or benign ones like altruism towards strangers.

Although there is no scientific consensus yet as to what religion is and how to explain it, there is growing agreement that a natural science of faith, religion, and spirituality is the next big thing on the horizon. Judging from the recent flurry of

PHOTO: MARTIN DEE

continued on page 3

the Next Big Thing

For the second year, UBC Reports has asked experts in a variety of fields to identify the next major advance that will influence our world. From personally customized drugs, to creating a new biofuel from wood, to the ability to assess animal emotions and more, their predictions capture our imagination about the possibility of discovery through research.



Pharmacogenomics will bring personalized therapies and prevent toxic drug interactions.



Disease Diagnosis and Therapy Customized to Each Person's Genetic Make-up

By Prof. Ronald Reid,
Chair, Division of Biomolecular and
Pharmaceutical Chemistry
Faculty of Pharmaceutical Sciences

Personalized medicine based on the individuality of the human genome will allow physicians and pharmacists to accurately characterize disease and identify not only the best drug to be administered to a particular patient for a specific disease, but also the correct, safe, and effective drug dose the first time.

Pharmacogenomics uses information

from the human genome to diagnose disease and predict the efficacy and toxicity of drug therapy, a concept that has come to be known as “personalized medicine.” The technology involved is complex, requiring large-scale experimental approaches combined with equally complex statistical and computational analyses. The fundamental strategy in a pharmacogenomics approach is to expand the scope from examining variations in single genes, proteins, and metabolites to studying the interaction of all genes, proteins, and metabolites that are

PHOTO: ©iStockphoto/Mike_Kiev

continued on page 5

the Next Big Thing

Read the entire 2007 Next Big Thing faculty expert survey, including the following:

- :: New Land Use Restrictions to Protect Water Security – Assoc. Prof. Karen Bakker
- :: A Boom in Aging Research – Asst. Prof. Colin Reid
- :: Grappling with the Moral Dimensions of Advances in Assisted Reproduction – Prof. Judith Daniluk

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IN THE NEWS

Highlights of UBC Media Coverage in Nov. – Dec. 2006. COMPILED BY BASIL WAUGH

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PHOTO: MARTIN DEE

CiTR 101.9 FM's Nardwuar the Human Serviette and Alison Benjamin.

State-Subsidized Destruction at Sea, Fish Feelings

UBC Fisheries Centre researchers featured prominently in international news in November. Prof. Rashid Sumaila was cited in coverage of a defeated United Nations proposal to ban environmentally harmful deep-sea bottom-trawl fishing, and Prof. Daniel Pauly was quoted in reports of U.K.-based *New Scientist* magazine's survey of the biggest anticipated scientific breakthroughs over the next 50 years.

Opinion pieces in France's *International Herald Tribune*, the *Vancouver Sun* and Montreal's the *Gazette* cited research led by Sumaila that found that international high seas bottom-trawling fleets would be unprofitable without some \$152 million a year in subsidies, mainly in the form of cut-price fuel, from countries including Japan, Russia, South Korea, and Spain. Without these subsidies, Sumaila estimates that the fleet would not be able to continue fishing.

Media in the U.K. and Australia, including the *Telegraph*, the *Guardian*, the *Times* and the *Australian* reported Pauly's statement that the most important development for the oceans would be a device that could detect, amplify and transmit the "thoughts" of animals in a way that would evoke empathy in humans.

"This would first work with

primates, then mammals in general, then the other vertebrates including fish," said Pauly. "This would cause, obviously, a global revulsion at eating flesh of all kinds, and we would all become vegetarians."

Prof. Considers New Liberal Party Leader

UBC political scientist Allan Tupper featured prominently in media coverage of the federal Liberals' choice of Stéphane Dion as party leader in early December.

In an interview with U.S.-based *Bloomberg*, Tupper said that the environment – an issue Dion campaigned heavily on – "is more important to voters in Quebec than people in other parts of the country." He added: "the Liberals [may] be able to reconstitute themselves quickly [in Quebec]."

In a *Globe and Mail* article, Tupper said: "Dion developed a considerable presence in Western Canada through his work on intergovernmental relations ... I think people in the major resource industries of Calgary would say they regard him as a straight shooter."

Tupper also appeared in the *Vancouver Sun's* Dion coverage.

Sex and the Oilpatch

The *Alaska Highway News* reports on a UBC study that examines the barriers for youth to sexual health services in Fort St. John.

UBC graduate student Shira

Goldenberg says the busy bar scene and culture of "binge partying" when oilpatch workers are on short- and long-term breaks have contributed to a rise of sexually transmitted infections (STIs) in Northeastern B.C.

Goldenberg says that issues like work schedules, clinic hours, availability of appointments, and even bus access are affecting the ability of youth to get tested for STIs.

Campus Radio Station Crowns City's Best New Band, Launches Podcasts

National music media reported on the 2006 edition of SHiNDiG!, the annual Vancouver battle-of-the-bands competition organized by CiTR 101.9 FM, UBC's student-led campus/community radio station.

CBC Radio 3 and *Chart Attack* magazine reported on the 13-week competition that concluded Dec. 5 at the Railway Club with *Victoria, Victoria!* being named the city's best new band. In total, 27 bands duked it out for recording, mastering and promotion prizes this year.

"Cheers to UBC campus station CiTR for putting on this battle of rock royale all these years ... you must be doing something very right," said CBC Radio 3 personality Grant Lawrence, adding that the finals featured "three very fitting and accomplished young bands."

CiTR, which recently introduced *CiTR on Demand* podcasts, has helped to launch some of the some of the biggest names in the Canadian independent music scene, including alt-country crooner Neko Case, a former SHiNDiG! winner; Lawrence, a former feature writer for CiTR's *Discorder* magazine; and Nardwuar The Human Serviette, CiTR DJ and MuchMusic "guerilla" interviewer. **R**

UBC REPORTS

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A Scientific System that Shuts Down New Diseases Fast

By Prof. B. Brett Finlay, UBC Peter Wall Distinguished Professor, Michael Smith Laboratories, and Prof. Robert C. Brunham, Provincial Executive Director, B.C. Centre for Disease Control (CDC) and Director, UBC CDC

Predicting the next big outbreak of an infectious disease is nearly impossible. For example, SARS came out of nowhere. Although bird flu is often discussed as a possible pandemic, it is also possible that the next big thing will be some new variant of a virus or pathogenic microbe that is new to us. Thus to us, the next big thing is to build capacity to fight an unknown foe by learning from past experience.

SARS was a major wake-up call to the world. It was unforeseen and unknown to medical science. It spread around the world in an extremely rapid fashion, and caused great anxiety worldwide. Although the number of people who actually were infected with the SARS virus was less than 10,000, and the number



PHOTO: MARTIN DEE

The SARS outbreak taught scientists new ways to respond to global health threats.

Asia and Canada. To put this in perspective, at least 54 million people die every year, and one-third of these die of infectious diseases; and the 1918 Spanish flu

and sequenced the SARS virus, and found it belonged to the coronavirus family, which usually only causes mild upper respiratory infections. In a

attempts include rapid science to develop prototype vaccines and new ways to scientifically respond to unknown threats (Finlay, B.B., See, R.H. and

Interestingly it was these public health approaches that broke the chain of transmission of the SARS virus and drove it back into nature.

Our capacity to do major science on infectious threats continues to accelerate. We can now rapidly identify and sequence pathogens potentially within hours of first isolation. We can employ sophisticated methods to develop vaccines and potential treatments. We can use mathematical modeling to predict global spread patterns and quantify the impact of treatment and quarantine strategies. Although it may appear that the sky continues to fall because of the prediction of new pandemics, we now have many new ways to counter these threats. In our opinion, the next big thing in the battle against emerging diseases is a coordinated global scientific attack on such problems. As in war, one must first understand the enemy, and then use that knowledge to try and overcome the threat. We are now entering an era where we can begin to

We can now rapidly identify and sequence pathogens potentially within hours of first isolation.

of people who died less than a thousand, worldwide SARS is estimated to have had a global cost of \$100 billion, mainly in



Prof. Brett Finlay

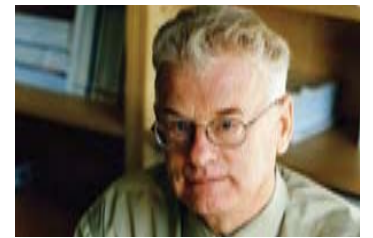
killed an estimated 20-40 million people, which is more than all those who died in World War I.

However, SARS taught us much about how new diseases emerge and how to respond to these threats based on coordinated ways that use cutting edge science to mobilize solutions. SARS galvanized the global public health community into sharing information in an unprecedented manner. Scientists rapidly isolated

global race to sequence it, its entire genome was unraveled in a mere eight days by at least three separate groups. Put into perspective, it was in the 1930s when scientists finally isolated the cause of the 1918 flu pandemic and it wasn't until 2005 that its genome was deciphered in a tour de force of paleogenomics. Knowing the sequence of an emerging pathogen leads to attempts to combat it. These

Brunham, R.C. 2004. Rapid response research to emerging infectious diseases: lessons from SARS. *Nature Rev Microbiol* 2:10-16). Moreover, the SARS experience also showed how we can rapidly determine how pathogens spread (small droplets and close contact), and use epidemiologic science to guide public health measures such as isolation or quarantine to limit further transmission.

understand and neutralize these threats, instead of standing by and hoping for the best. This is the next big thing. **R**



Prof. Robert Brunham

SCIENCE of FAITH *continued from page 1*

best-selling books and scientific conferences on religion, scientists and philosophers are awakening to the reality of religion as a reliable aspect of human nature and culture.

Passionate devotion to God has waned little, no matter what scientists and scholars have predicted. In 1851, French historian Ernest Renan wrote that Islam would be the last religious creation of humanity. Others – from Freud to Dawkins – have subscribed to what the sociologist Peter Berger calls the “secularization myth,” that with the advances of science and technology, and the growing affluence of societies, religion, like alchemy and body armor, will become a thing of the past. Until now, scientists have either ignored religion, or railed against it.

At the dawn of the 21st century, religions are multiplying, growing and mutating at a brisk pace. In one estimate, two to three religions per day are created in the world today, although only a few survive and propagate in the cultural marketplace.

Pentecostalism, a Christian fundamentalist “charismatic”

sect, is likely to have one billion members by 2050 if current trends continue. Fundamentalism among Islam’s 1.3 billion people progresses apace, and fundamentalist movements are also making significant inroads into Judaism, Christianity and Hinduism.

The United States – the world’s most economically and militarily powerful society with a highly educated population and a scientifically advanced one – is also one of the most religious: 96 per cent of Americans believe in God, 93 per cent and 85 per cent believe in heaven and hell respectively, and almost 50 per cent believe in devils and in a literal interpretation of the Bible.

In one line of research, my graduate student Ian Hansen and I examined what, if anything, belief in God contributes to the tendency to scapegoat other religious groups for the problems of the world, which is often associated with religious intolerance. In a sample of more



than 10,000 people across several continents and encompassing all the major religious groups of the world, we found, unsurprisingly, that those who dogmatically believe that their God or belief is the only true one, were more likely to scapegoat. However, secularization did not seem to be associated with reduced scapegoating: those who believed in the existence of God actually were less likely to scapegoat.

More directly relevant to violence, with the psychologist Jeremy Ginges at the New School for Social Research, we examined Muslim Palestinian support for suicide attacks against Israelis. Contrary to popular belief, those who prayed to God frequently were no more or less likely to support suicide attacks than those who did not, although those who frequently attended Mosque were more likely to endorse violent martyrdom. This pattern was not

unique to Muslims, however: in another study, Jewish religious settlers in the West Bank who were reminded of prayer to God were less likely to approve of violence against Palestinians compared to those reminded of synagogue attendance. My graduate student Azim Shariff and I have also found that in controlled experiments of altruistic behaviour, unconscious reminders of the presence of God increased generosity towards anonymous strangers among Canadians.

If religion and spirituality

in one form or another are part of what it is to be human, then a science of faith, from neuroscience to sociology, is one essential element in multicultural civil societies such as Canada and the United States. A science of faith cannot tell us about moral choices and about the meaning of life; it neither condemns nor defends religion, any more than biology exalts or assails spider webs or beaver dams; but it can tell us important things about the origins and consequences of religious beliefs and experiences. **R**

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Alternative Existence in...

By Brian Lamb, Manager,
Emerging Technologies &
Digital Content, Office of
Learning Technology

Right now on the web the most rapid growth, the most innovation, and the most buzz concerns the emergence of three-dimensional immersive environments for online activity. These parallel worlds, populated by virtual avatars representing human beings in the physical world, are home to activities and interactions that a short time ago might only have been imagined in science fiction.

Immersive worlds are largely a by-product of the massively multiplayer online games that allow thousands to play inside a dizzying array of virtual environments. Perhaps the best known of these is Vivendi Universal's *World of Warcraft*, in which players adopt the roles of warriors or hunters questing for virtual gold and power in an atmosphere somewhat reminiscent of *The Lord of the Rings*. Improved personal computing power and the growth of high-speed Internet access has resulted in exploding popularity



Through their avatars, visitors to *Second Life* can get down and boogie at their favourite club.

for these rich 3-D spaces.

Second Life is a 3-D world that extends the concept of immersive environments beyond

gaming. As its name suggests, *Second Life* is a user-created world defined by the activities of its "residents" within a virtual

"meta-verse" developed and made publicly available by a California company, Linden Labs. Each user creates a

personal avatar by choosing amongst hundreds of settings and options, and most of the environment is built by the

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residents themselves. *Second Life* has its own internal economy, and its own currency, known as Linden Dollars, which may be used to purchase "land" or goods and services from other residents. Purchases may range from stylish clothing needed to make a dashing impression to a "Complete Storm System"

speculators, advertisers and private detectives. *Second Life* has already proven to be a popular outlet for musical performances, with real world music acts staging shows themselves and others creating virtual tributes for popular acts such as U2.

As the technology improves in

support Professor Marvin Cohodas's art history courses. And the Masters of Digital Media Program, a collaboration between UBC, Simon Fraser University, Emily Carr Institute and BCIT, will also be staging course activities in a *Second Life* campus when it opens on the Great Northern Way Campus in

These parallel worlds, populated by virtual avatars representing human beings in the physical world, are home to activities and interactions that a short time ago might only have been imagined in science fiction.


that allows users to summon rain, hail and lightning from the digital sky.

Boosters of *Second Life* suggest that the range of virtual business opportunities is comparable to that in the real world. Design firms that specialize in creating stunning structures and landscapes are collecting sizable fees in both real and Linden Dollars, and residents are making real-life livings in virtual professions serving as wedding planners, casino operators, real estate

its power to engage, researchers and educators are increasingly exploring the use of virtual worlds. The University of British Columbia's Faculty of Arts Instructional Support & Information Technology (ISIT) unit has been building a *Second Life* island campus, named Buchanan, after the Faculty's main building. The island draws inspiration from features of the UBC campus such as the Rose Garden, the Clock Tower, and the Chan Centre, with spaces filled with ancient works that

September 2007.

Given the continued advances in technology and infrastructure, and the stunning growth in environments such as *Second Life*, immersive virtual worlds may well be the next big thing in online culture.

For more information on *Second Life* projects at UBC, visit a blog on ISIT's virtual campus at <http://ubcartsecondlife.notlong.com>, or the Masters of Digital Media blog at <http://mastersofdigitalmedia.blogspot.com/>. 

DISEASE DIAGNOSIS *continued from page 1*



relevant to disease diagnosis and a successful therapeutic outcome.

The application of pharmacogenomics to health care emphasizes that the present paradigm of "evidence-based medicine," the techniques of which are derived from randomized and double blind clinical trials, is inconsistent with "personalized medicine."

The application of statistical information derived from clinical drug trials on large populations results in a standard dose range for the population, which both overdoses and underdoses a small but significant portion of that population. The failure to recognize patients as individuals is likely a factor in adverse drug and toxic drug-drug interactions that account for 100,000 patient deaths, two million hospitalizations, and \$100 billion in health-care costs in the United States yearly.

Over the next 20 years, in an effort to effectively address the problems of adverse drug and toxic drug-drug interactions, pharmacogenomics research will further refine the paradigm of "personalized medicine" through the development of

technologies to determine the precise biochemical changes, referred to as a metabolic phenotype, underlying a disease pathology and therapy and the elucidation of environmental factors (e.g., diet, lifestyle, culture, exposure to other chemicals, etc.) contributing to the many components of the metabolic phenotype. By comparing the metabolic phenotypes of normal and disease states, nucleic acid, protein, and small molecule biomarkers descriptive of a disease phenotype can be identified.


Similar studies on the biochemical changes involved in drug therapy will provide biomarkers characteristic of drug metabolism, distribution, and drug action descriptive of successful therapeutic outcomes (therapeutic phenotype). This will permit a better understanding of disease pathology, provide new drug targets for disease therapy, identify biomarkers characteristic of disease potential and development as well as biomarkers descriptive of drug efficacy and toxicity.

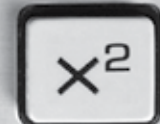
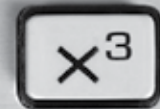
For example, in the future, physicians will send off a patient's urine sample for analysis of several hundred molecules (biomarkers) arising from the patient's metabolism. The pattern of concentration of these molecules in the disease state, compared to the pattern in a healthy individual, will enable individualized diagnosis and therapy, even in complex

diseases such as schizophrenia. The analysis and results will be available to the physician within hours.

The development of the information technology (Health Informatics) necessary to make sense of this complex area is in the early stages of development. As knowledge and technology progress, genomic information will come well within the realm of routine use. Over the coming years, standard blood and urine tests augmented by new sources of medical data will yield a plethora of new information about a patient's current and future health and provide new directions for individualized disease prevention and therapy.

These advances in biomedical knowledge and information systems will result in novel approaches to genetic counseling, patient education, risk assessment, medical decision making, monitoring treatment, privacy and regulatory issues, and patient empowerment, which will shift the emphasis of health care from the reactive response to illness to the proactive minimization of unnecessary morbidity over an individual's lifetime.

Finally, the realignment of the medical paradigm from "evidence-based" to "personalized" via the application of pharmacogenomics should provide a viable solution to optimize disease diagnosis and patient therapy and significantly reduce costs to the health-care system. 



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Finding the Treatment, and Possibly Cure, for Diabetes in the Human Gut



PHOTO: ©iStockphoto/motocad

Got gut? Gut hormones may help combat diabetes; gastric bypass can reverse it.

By Timothy Kieffer,
Assoc. Professor of Cellular and
Physiological Sciences

Diabetes threatens to become a global health crisis. Many predict that unless we begin altering the behaviours that put our young people at risk of developing the disease, treating

diabetes and its complications is going to dominate future health-care expenditures. Indeed it is predicted that one of three children born now will develop diabetes. Approximately 250 million already have the disease and it will present them with debilitating complications like blindness, kidney failure and

limb amputations. Even with treatment, diabetes currently reduces life span by an average of 15 years; about three-quarters of patients die of stroke or heart attack.

More than two-thirds of people with diabetes are obese. They require drugs that stimulate beta-cells to make more insulin

and/or drugs that help insulin work better. When these don't work any longer, people require insulin. Unfortunately this form of diabetes is growing at an alarming rate, along with our waistlines. There are already approximately one billion obese individuals, with the incidence tragically growing most in our children. Fat-laden and sugar-rich food combined with lack of physical activity appear to be the sinister recipe.

The good news?

There are exciting new therapies on the way that have the potential to not only treat diabetes, but perhaps even cure it. The US Federal Drug Administration recently approved new therapies that harness GLP-1 and the UBC-discovered hormone GIP, a class

DPP4, that normally destroys incretins. They went on to show that inhibitors of DPP4 could enhance incretin levels and thereby improve control of blood sugar levels. The first DPP4 inhibitor, Januvia™, will be on the market soon, and others will follow.

Scientists on campus are also developing ways to coax the gut incretin cells into making insulin. The natural ability of these cells to release hormones at meal-time means that this strategy could eliminate the needle injections and guess work associated with traditional insulin therapy. The same strategy might be used to boost the release of satiety factors – agents that make us feel full. Feeling full sooner could help curb overindulgence.

Additional remedies will likely come from the gut. Gastric

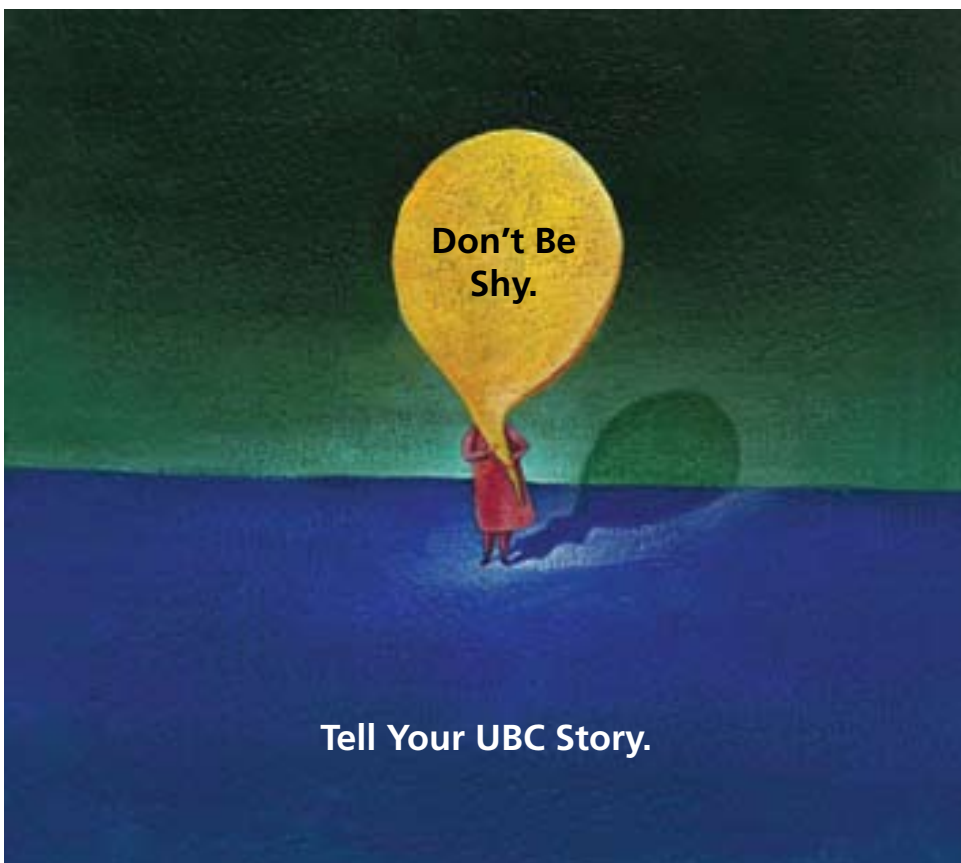
The natural ability of these cells to release hormones at meal-time means that this strategy could eliminate the needle injections and guess work associated with traditional insulin therapy.

of gut hormones called incretins, that are released from the gut during meals and stimulate insulin release. Unlike currently used drugs, these incretins also entice the pancreas to manufacture more insulin and even to make more beta-cells. Thus, when combined with an immunosuppressor, these agents may actually coax the body to help itself, even in those with long-standing type 1 diabetes. They may also be good for the heart. The first incretin-based therapy, Byetta™, is now available in the US. As an added reward, many taking Byetta™ lose a substantial amount of weight.

UBC researchers discovered another way to take advantage of incretins. They noted that the body produces an enzyme,

bypass – a surgical procedure that results in food bypassing a portion of the stomach and intestine – results in profound weight loss by limiting the amount of food the patient can comfortably eat. Remarkably, it can also cure diabetes before pounds are shed; it is not simply a matter of eating less. Within the next few years we will likely learn how gastric bypass reverses diabetes such that we can replace the scalpel with pills that produce the same effects.

Researchers are working feverishly in both academic and industrial settings to arrest the epidemic of both obesity and diabetes. They say the way to a man's heart is through his stomach ... in this case it just might be true. **R**



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Back to the Future

Substituting Wood for Oil with the “Forest Biorefinery”

By Jack Saddler,
Professor of Forest Products
Biotechnology and Dean,
and Warren Mabee, Research
Associate, Dept. of Wood
Science, Faculty of Forestry

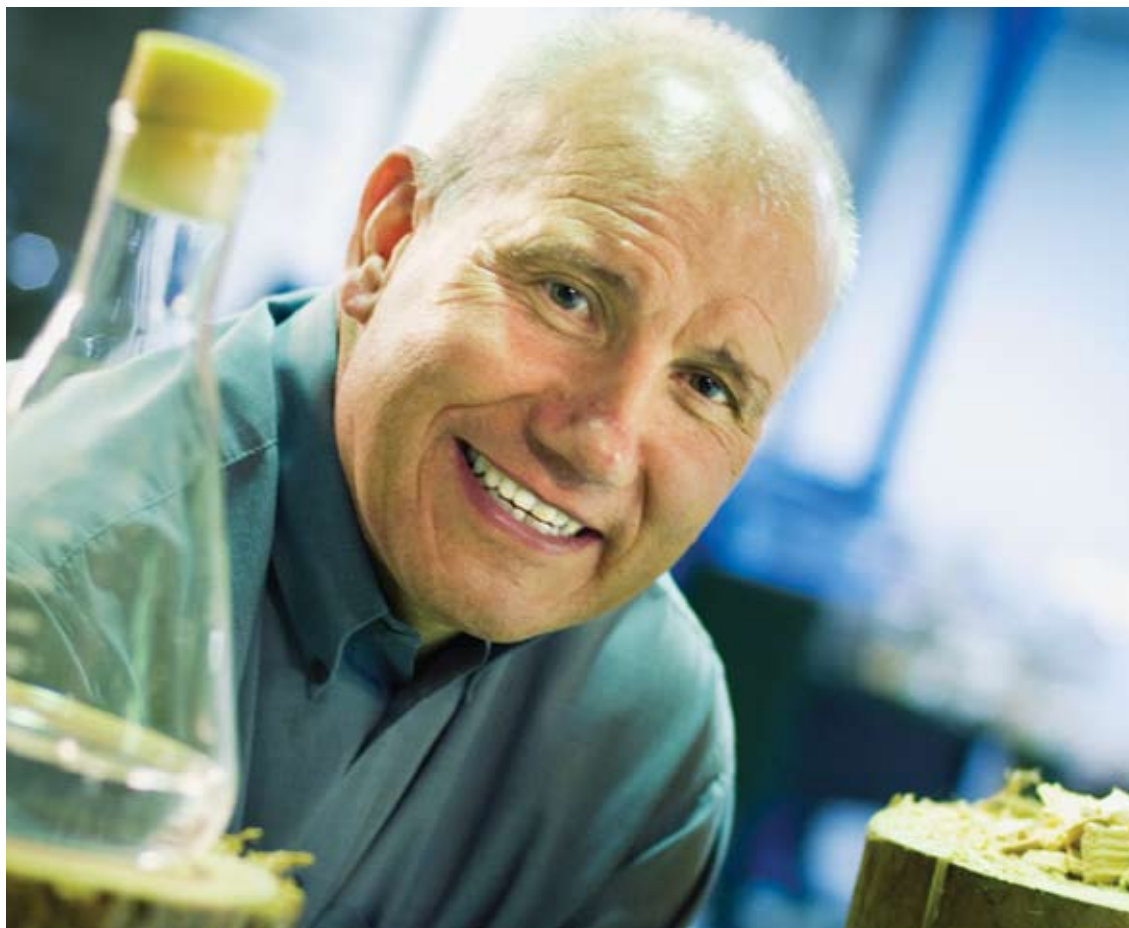
Currently, 97 per cent of the North American transport sector runs on petroleum, with ethanol derived from corn and wheat accounting for the majority of the remaining two to three per cent. However, in the next five to 10 years, it is projected that new technologies will allow liquid biofuels – like ethanol or butanol – to be produced economically from biomass such as agricultural and wood residues. This could signal a seismic change for Canada’s and the world’s agricultural and forest industries.

Over the last year or two, there has been a huge surge of interest in biofuels and other forms of bioenergy. Although oil prices have fallen somewhat over the last month or so, they remain relatively high, influencing everything from personal to national budgets. It is certain that uncertainty will continue for oil prices, due to the seemingly intractable conflicts in the Middle East oil-rich countries and the vulnerability of other critical oil producing regions to extreme weather events.

Governments in Europe, North America and Asia have embraced biofuels and bioenergy to in part address social and economic concerns over global energy supplies. For example, Sweden has a national target of being fossil-fuels free by 2020, with bioenergy (including the importing of wood pellets from B.C.) playing a key role in attaining this target.

Similarly, roadmaps developed in the U.S. have assessed that country’s potential for biomass growth and biofuel production, and found it may be possible to offset the almost one billion dollars a day the U.S. currently spends on imported oil. The U.S. Dept. of Energy has forecast total ethanol production from corn and cellulose to be about 40-56 billion litres annually by 2030. While this would be equivalent to about 30 per cent of global ethanol production it is still less than 10 per cent of projected U.S. demand. President Bush’s Advanced Energy Initiative, announced in his 2006 State of the Union address, increased research funding for cellulosic ethanol, with the goal of making it cost competitive with corn-based ethanol by 2012.

Over the past few years, UBC has been fortunate in obtaining federal and provincial support to establish a world-class Clean Energy Research Centre based in the Faculty of Applied Science, while the Faculty of



Forestry Dean Jack Saddler forecasts a seismic change in agricultural and forest industries when biofuels can be produced economically in the next decade.

Forestry has received about \$2.5 million to establish a Process Development Unit (PDU) to assess the potential of wood-based biofuels and chemicals. Our group also acts as the Task

pine in the province of British Columbia by 2013, served to provide a focus for the meeting. An outbreak of this size is unprecedented in recorded history. There is an accumulating

model of business which all types of industry could follow.

UBC is carrying out research which addresses some of the key challenges associated with increased biofuels and bioenergy

If only 25 per cent of the MPB-killed wood in BC was converted to ethanol, it could supply between five and 10 years’ worth of B.C.’s gasoline requirements.

Leaders for the International Energy Agency’s (IEA) network, coordinating the technical and policy issues influencing the global commercialization of liquid biofuels from biomass.

In August 2006, The Forest Products Biotechnology group at UBC organized a meeting which hosted more than 130 experts from around the world to discuss bioenergy development. Senior experts from North America,

surplus of standing deadwood in our forests, which increases the danger of catastrophic fires and reduces the merchantable volume of the working forest. While we will try to recover as much of the beetle-killed wood as possible in the short term for structural applications, we know that wood impacted by MPB loses its value as timber over time, and so wood that has been standing dead for extended periods cannot be processed into lumber, pulp or other advanced wood products. In the longer term, development of bioenergy applications may provide us with a cost-effective product that justifies harvesting and replanting activities. For example, if only 25 per cent of the MPB-killed wood was converted to ethanol, it could supply between five and 10 years’ worth of B.C.’s gasoline requirements.

For the global forest industry, moving away from fossil fuels is an economic necessity, as volatility associated with fossil fuels has resulted in high energy costs for the industry in recent years. There is a need to extract additional values from our forest resource, and a need to accept ecosystem realities in forest industry practices. Biofuels and bioenergy, which are inherently carbon-neutral and work within the carbon cycle, represent a new

co-products. In all cases, the use of wood for biofuel production should be linked to bioenergy and bioproduct generation, creating a ‘biorefinery’ with multiple outputs. The biorefinery concept provides maximum economic and environmental returns by efficiently utilizing all components of the wood.

Some of the major challenges will be political, rather than technical. In the short term it will be necessary to increase the financial incentive for using electricity or fuels derived from biomass. In Canada, the cost of electrical power is low enough that bioenergy generation facilities have difficulty in competing. Policies might also be applied to encourage the development of bioenergy production in existing forestry and agricultural processing facilities, such as an accelerated capital-cost write-off schedule. One recent development is the emergence of mandates for biofuel use as seen in Europe, where 5.75 per cent of fuels must be renewable by 2012, as well as in the United States (five per cent by 2012) and Canada (five per cent by 2010).

The size of the biofuel and bioenergy opportunity in Canada is huge and biorefinery technologies can and will bring about major changes to the sustainable energy future for our nation. These technologies have the potential to add long-term, sustainable jobs in rural, urban, and aboriginal communities.

What is needed now is continued collaboration to create technical platforms for effective and sustainable use of bioenergy, and a strong political will for putting these platforms to work.

For more information contact Warren Mabee (warren.mabee@ubc.ca) or Jack Saddler (jack.saddler@ubc.ca).



Europe, Asia, and Africa each brought their own unique perspectives to the table and helped define the technical and political challenges and significant opportunities that the current and future biofuels and bioenergy sectors will face. One clear outcome of the meeting was that there are significant opportunities that new biofuel and bioenergy technologies can provide in terms of social, economic, and environmental returns.

The ongoing Mountain pine beetle (MPB) outbreak, projected to cumulatively impact almost 1 billion cubic metres of lodgepole

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Viral Videos, or Global Mobilization?



PHOTO: MARTIN DEE

Pop culture theorist Gisèle Baxter asks whether all our instant communication will lead to greater splintering or more cohesion – or both?

By Gisèle M. Baxter,
Sessional Lecturer, Dept. of
English, Faculty of Arts

Growing up, my vision of future communications owed much to Star Trek, with its efficient communicators and cross-galaxy telescreens.

Communication technology has experienced a revolution over the last 20–30 years that science fiction scarcely dreamt, a seismic shift on the order of the invention of the telephone, or of movable type. Does the possibility of instantaneous global contact suggest a smoothly connected network, or a system of mostly disconnected pockets of communication?

YouTube is full of webcam-recorded confessions that before would have been consigned to a diary kept safely hidden.

In some ways the 21st century began with the development of the silicon chip, and accelerated with the advent of the Internet. Cultural phenomena (from fandom to online role-playing games) develop as people quickly locate others who share their passions. Grassroots political movements mobilize. Distant expertise is available to enthusiastic neophytes. Marginalized voices find or create forums.

Yet as one review of the movie *V for Vendetta* suggested, it would be interesting to know what happens the day after the revolution. We currently face two significant directions that communication technology could take (one need not preclude the other). One is a continued splintering of cultural interests and preoccupations, challenging and engaging with notions of mass culture and cultural hierarchies. (My own work in popular culture

suggests that trends increasingly resist definition and are often ephemeral, also that they tend to coexist with a variety of other trends rather than dominate the popular imagination.) The other direction is the possibility of genuine global mass movement towards widespread change.

E-mail has become so common that I wonder what the collected correspondence of notables will resemble by the end of this century. Social networking systems such as LiveJournal or MySpace enable easy development of interactive multimedia sites to be shared with existing friends and promoted to attract new ones. A cellphone now

this contact include? Orwell's telescreens were visible. Now, Big Brother might be more apt to peer silently over our shoulder. A weblog rant about work or a cellphone conversation on the bus is hardly private, but if surfing habits invite tailored advertising, or if shared images end up in third-party hands, the early assumption that e-mail is about as private as a postcard echoes resonantly. Moreover, copyright controversies apply to more than old commercials captured to *YouTube*.

However, while many might fear they'll be caught downloading pirated movies onto their computers (and this is the sort of debate most

allows you to chat while text-messaging while checking email while taking a picture while listening to downloaded music. Especially but not only among young people this is changing the nature, even the syntax of communication, and challenging notions of privacy.

We may actually have come to fear privacy as too much like loneliness. *YouTube* is full of webcam-recorded confessions that before would have been consigned to a diary kept safely hidden. Do we dare to say something without at least the chance of an audience? With all the instantaneous communication at our disposal, have we come to dread not having a lengthy "friend list?" And what does this contact amount to: conversation in the traditional sense, or snippets of information and links to homemade videos and reports of celebrity transgressions?

And what others might

often foregrounded by the media), others face more serious restrictions. Where dissent is especially discouraged, governments tend to clamp down on Internet access. This suggests that the possibility of political mass movements being formed and promoted online is real. Surely there is a critical mass of people worldwide with big concerns: war, starvation, epidemic, environmental crisis, for example. Could the technology of mass communication enable the sort of connection that might actually mobilize genuine global activity towards significant change?

Further advances in communication technology are inevitable: however, the way that question is addressed in this century will say much about the actual impact of these advances, and about the way we view the relationship between risk and benefit. **R**

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Assistant Dean, Postgraduate Medical Education

The Faculty of Medicine, University of British Columbia invites applications and nominations for the position of Assistant Dean, Postgraduate Medical Education. This position will be filled by an internal candidate and has an expected start date of March 1, 2007.

The applicant must have a demonstrated interest and experience in residency education and in the operations of residency training. An MD with either CCFP or RCPSC certification, and a UBC faculty appointment are required. Preferably, the applicant should have significant experience running a residency training program at the level of a program director, and will have demonstrated leadership skills and educational innovation. Demonstrated skills in working collaboratively are also required.

The individual will work closely with and report to the Co-Associate Deans, Postgraduate Medical Education.

Faculty of Medicine | Deans Office

www.med.ubc.ca

Applications, accompanied by a letter indicating interest and suitability for this position as well as a detailed curriculum vitae and names of three references, should be directed to:

Dr. K. Sivertz and Dr. K. Rungta
Co-Associate Deans, PGME
c/o Darcie Prosser
Faculty of Medicine
University of British Columbia
Room 317, Instructional
Resources Centre
2194 Health Sciences Mall
Vancouver, BC V6T 1Z3
(searches@medd.med.ubc.ca with subject line: Assistant Dean-Postgrad)

Closing date: February 1, 2007

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Associate Dean, Research

The Faculty of Medicine, University of British Columbia invites applications and nominations for the position of Associate Dean, Research. This is a part-time position to be filled by an internal candidate with an expected start date of July 1, 2007.

Faculty-wide responsibilities are: (a) to provide leadership in working with government and community partners to enhance health research at UBC; (b) in partnership with the Senior Associate Dean and Assistant Deans Research, to lead the integration of the research effort at all sites, in other faculties at UBC, and with other research universities; (c) to maintain the Faculty grants approval process and central monitoring of grant applications; and (d) to approve on behalf of the Faculty (with delegation to appropriate Assistant Dean) all research grants submitted to granting agencies.

Point Grey Campus (excluding UBC Hospital) responsibilities are: (a) to maximize, with other research leaders, the research effectiveness of the Life Sciences Institute and Centre for Disease Modelling; (b) to work with the Basic Science Department Heads and Research Centre Directors to maximize the research effectiveness of the campus; and (c) to represent the views of researchers on the Point Grey campus in all appropriate forums.

The individual will work closely with the Senior Associate Dean, Research to develop new strategic research initiatives for the Faculty of Medicine. The incumbent will report to the Senior Associate Dean, Research and through the Senior Associate Dean, is accountable to the Dean.

Faculty of Medicine | Deans Office

www.med.ubc.ca

Applications, accompanied by a detailed curriculum vitae and names of three references, should be directed to:

Dr. Alison Buchan
Senior Associate Dean, Research
c/o Darcie Prosser
Faculty of Medicine
University of British Columbia
Room 317, Instructional
Resources Centre
2194 Health Sciences Mall
Vancouver, BC V6T 1Z3
(searches@medd.med.ubc.ca with subject line: Associate Dean-Research)

Closing date: February 15, 2007

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Assessing Animal Emotions

By Assoc. Prof. Dan Weary,
UBC Animal Welfare Program,
Faculty of Land and
Food Systems

Concerns about the welfare of animals

are nothing new, but the best way to care for animals is not always clear. Now the developing field of animal welfare science is helping people make better decisions regarding animal care.

Cat owners, pig farmers, laboratory scientists and many others need knowledge-based recommendations on how to house and manage the animals under their care, as the requirements for good care are not always clear and some practices thought to help animals may also cause harm. For example, the cat owner may feel that his cat needs to explore, roam and hunt, but allowing the animal outside increases its risk of disease and injury. The pig farmer may wish to provide a nutritionally complete diet and prevent obesity in her sows, but feeding limited quantities of a concentrated diet can leave the animals in a chronic state of hunger. The laboratory scientist may wish to provide housing that prevents the spread of disease by using caging that is easy to wash, but the barren housing conditions that result can lead to mice spending much of their day engaged in stereotypical behaviours that are repetitive and non-functional.

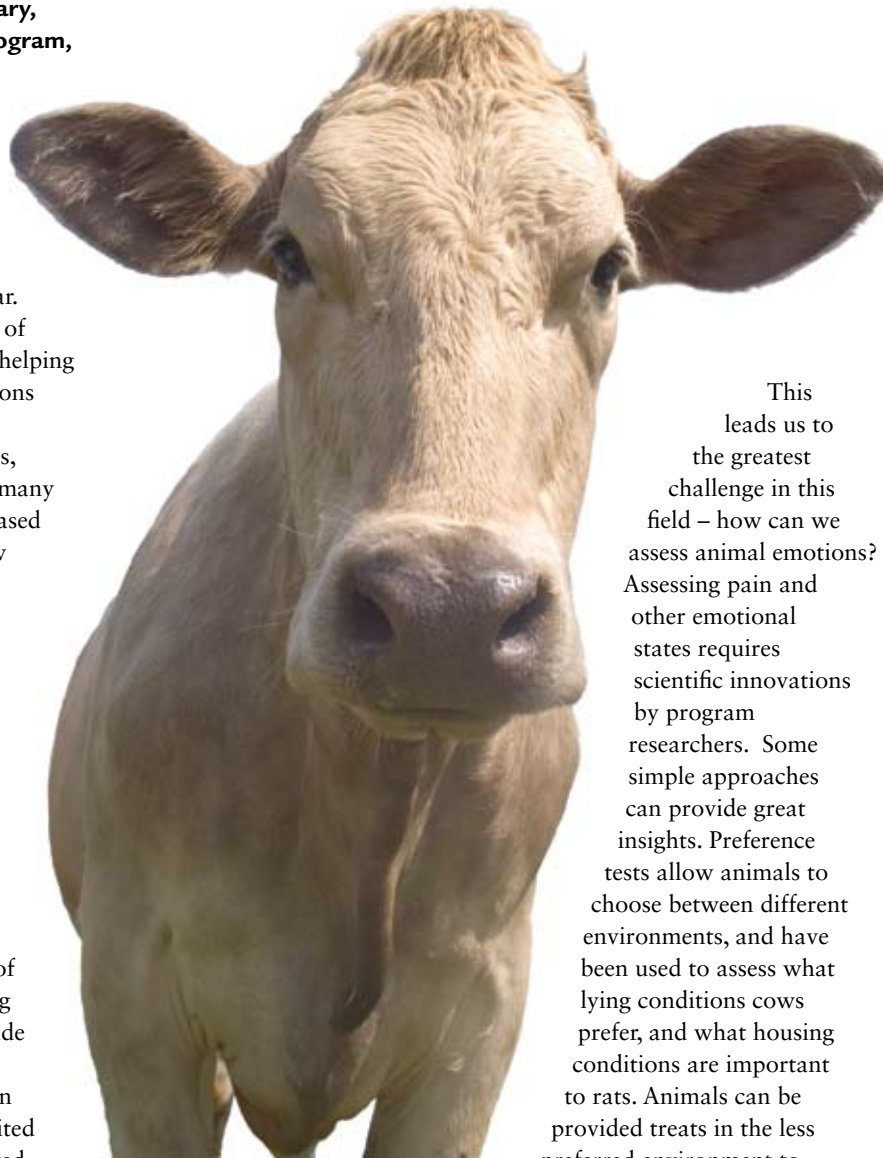


PHOTO: ©iStockphoto/texasmary

This leads us to the greatest challenge in this field – how can we assess animal emotions? Assessing pain and other emotional states requires scientific innovations by program researchers. Some simple approaches can provide great insights. Preference tests allow animals to choose between different environments, and have been used to assess what lying conditions cows prefer, and what housing conditions are important to rats. Animals can be provided treats in the less preferred environment to assess, for example, how much rats are willing to tolerate noxious conditions. Measures of pain are validated using proven analgesics, and some work has shown that animals with painful injuries will select feed that has been dosed with analgesics. Now new work is suggesting that how animals think can be used to assess how they feel. For example, when dairy

welfare. In the past, scientists working in this area tried to define welfare in terms of their own biases or what they were able to measure. For example, animal scientists focusing on food animal production used measures of animal growth or productivity, and physiologists used measures of heart rate or

...conditions we provide animals should address concerns about animal health, the expression of natural behaviours, and animal emotions including pain, hunger and boredom.

UBC's Animal Welfare Program provides research-based recommendations for animal care but faces three challenges in achieving this goal. First, good ideas that improve the lives of animals must also be practical. For example, horns on adult dairy cattle are dangerous for farm workers and injure herd mates, so the horn buds are typically removed from the calves using a hot iron. This is an unpleasant chore for the farmers, and painful for the calves. Research within the program has now developed a simple and inexpensive method of de-horning that includes sedating calves and preventing the pain, and this method also makes the chore of de-horning much easier to perform.

The second challenge is developing methods of assessing

blood cortisol.

Program researchers have led the field to the current consensus: conditions we provide animals should address concerns about animal health, the expression of natural behaviours, and animal emotions including pain, hunger and boredom.

calves are provided a gambling task using a computerized milk feeder, calves 'play' less frequently when they become ill. This result indicates that clinically ill calves also feel 'sick', and could also lead to improved methods of early diagnoses and treatment on dairy farms. **R**



Dan Weary is an animal welfare expert at UBC.

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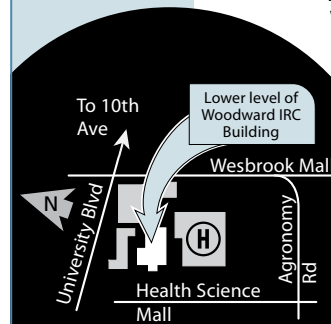
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Instructor | MD Undergraduate Program

The University of British Columbia is undergoing a major expansion of its MD Undergraduate program - dramatically increasing enrolment and recruiting outstanding new teaching and research faculty. New teaching and research facilities are under construction on the Point Grey Campus of UBC and its affiliated hospitals.

Applications are invited for faculty appointments as Instructors, either full-time (tenure track) or part-time in the disciplines of: Anatomy, Cell Biology, Biochemistry, Medical Genetics, Epidemiology, Pathology, Pharmacology, and Physiology.

These positions will be in the UBC Faculty of Medicine with primary appointments in the Vancouver and Fraser Medical Program (Vancouver). Involvement in delivery of the Island Medical Program (Victoria) and Northern Medical Program (Prince George) is also possible. Each position will be appointed in an appropriate UBC department and will also report to the MD Undergraduate Program regarding teaching and curriculum activities.

There will be a broad spectrum of teaching responsibilities. Successful applicants will provide tutor instruction for Problem Based Learning tutorials; lab instruction where appropriate; curriculum management and development, student evaluation and exam development; remediation; and will participate in faculty educational development. Primary responsibility will be within the first two years of the MD Undergraduate Program; however some involvement is possible in the clinical years. Opportunities for administrative responsibility and leadership will also be available from July 1, 2007. Salary will be commensurate with qualifications and experience. These positions are subject to final budgetary approval.

Applicants are expected to have an MD or PhD in one of the listed disciplines, plus experience and demonstrated interest in teaching and education. In specialized cases (e.g. anatomy), other qualifications will be considered. Experience in a medical school program is an asset.

Faculty of Medicine | Deans Office

www.med.ubc.ca

Applications, accompanied by a letter indicating interest and suitability for this position as well as a detailed curriculum vitae and names of three references, should be directed to:

Dr Angela Towle
Faculty of Medicine
c/o Darcie Prosser
#317 - 2194 Health Sciences
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(searches@medd.med.ubc.ca with subject line: **Instructor MD Undergrad**)

Closing date: Feb 15, 2007

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POLICY #82 CALL FOR COMMENTS

Policy #82 Relocation of Faculty Members and Senior Management Staff was approved in February of 1980 and has not been amended since then, apart from periodic updates to the rate schedule. Beginning over 2 years ago consultations with stakeholders began to update the policy. Development has been carried across 2 successive committees and the resulting proposal for a new policy has been presented for information to the Board of Governors. The next stage is public consultation on the policy proposal before it is submitted to the Board of Governors for final approval.

The purpose of the proposed new policy is to facilitate the hiring or internal transfer of outstanding faculty members and designated senior staff with travel and relocation assistance to move their families, homes, offices, and tools of the trade in order to establish them at UBC. This is a scope change from the current policy, which does not include internal transfers of faculty members and which does not deal with staff at all. The policy proposal is also intended to be more family-friendly.

The methods to achieving success in these stated goals are to:

- Establish a flexible relocation plan with the ability for unit administrators to make exceptions to the caps if the relevant unit will meet the extra costs.
- Identify and inform the Designated Professionals intended to be covered.
- List the range of allowable expenses within expenditure ceilings by category and an overall expenditure ceiling.
- Maintain a central account to fund a common level of contribution toward relocation expenses. This provides a partial contribution based upon 2 simple factors (number in move, location of move) without the need for the Office of Financial Services to review the transaction details and receipts that have already been processed by the departments. (The Office of Financial Services may still conduct audits, however.)
- Allow UBC to use or specify the use of relocation companies.
- Only pay moving expenses not payable from grants or other sources.

Clear lists of eligible moving expenses and ineligible moving expenses are provided that now also include most immigration expenses. The cost of moving tools of the trade (such as, for example, laboratory equipment) is eligible for reimbursement where appropriately authorized.

The Associate Vice-President, Human Resources is responsible for the proposed policy but the Vice-President, Administration and Finance is responsible for operation of the central account fund that compensates departments for moves according to a schedule. The style of the policy puts the definitions at the end and all numeric text that will likely need to be updated periodically has been moved into a table in order to simplify the process of making updates. The President has the ability to authorize the Responsible Executive to update this numeric text, provided that the update is followed by an informational notice to the Board of Governors.

We are now seeking advice and comments from the University community.

For the full text of the proposed Policy #82 follow the link at

<http://www.universitycounsel.ubc.ca/news/index.html>.

Please submit feedback to the Office of the University Counsel at university.counsel@ubc.ca.

All feedback should be submitted by 4:30 pm on Friday, January 26, 2007.

It is expected that, subject to feedback from this public consultation process, the proposed new policy will be submitted to the Board of Governors with a request for final approval at its regularly scheduled meeting in March of 2007.

THE UNIVERSITY OF  BRITISH COLUMBIA



Senior Associate Dean, MD Undergraduate Education, Faculty of Medicine

Applications and nominations are invited for the administrative position of Senior Associate Dean, MD Undergraduate Education at The University of British Columbia (UBC). This is an exceptional opportunity to play a leadership role in medical education and research in a dynamic and innovative Faculty of Medicine.

UBC's Faculty of Medicine is experiencing unparalleled growth in both research and education. An international leader in distributed medical education, together with the University of Victoria and the University of Northern British Columbia, the Faculty is moving rapidly to double its enrolment in Medicine.

The Senior Associate Dean, MD Undergraduate Education will report to the Senior Associate Dean, Education, and through the Dean will be accountable to the Faculty Executive Committee, the Committee of Department Heads and School Directors, and Faculty. The Associate Deans for Curriculum and the Vancouver Fraser Medical Program, Student Affairs, and Admissions are accountable to the Senior Associate Dean, MD Undergraduate Education, as are the Associate Deans of the Island Medical Program and the Northern Medical Program, on matters relating to the delivery of the undergraduate medical program.

This individual will provide leadership to and promote continued innovation in the undergraduate program, and will develop strong and productive relationships with the universities of Victoria and Northern British Columbia. Areas of responsibility will include: the planning and communication of the evolving expanded MD undergraduate program; developing modified and new program components and giving guidance on implementation; ensuring coordination of the undergraduate program with postgraduate education; maintaining the

accreditation of the MD undergraduate program; and developing and fostering relationships with accrediting bodies, medical associations, educational institutions, teaching hospitals, and other stakeholders.

The successful candidate will have an MD and a documented record of success in providing leadership in academic health education. S/he will have a solid teaching record, a demonstrated ability to work with colleagues in Medicine and other health-related disciplines, and outstanding communications skills.

UBC hires on the basis of merit, and is committed to employment equity. All qualified persons are encouraged to apply; however, Canadians and permanent residents of Canada will be given priority. In addition to this administrative position, a corresponding appointment with the Faculty of Medicine will be required.

The anticipated start date for the position is July 2007, or upon a mutually agreeable date. The deadline for applications is February 15, 2007, at which time the Search Committee will begin consideration of candidates. Please direct applications or nominations to the address below:

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Segways for Disabled People

By Asst. Prof. Bonita Sawatzky, Orthopaedics UBC, Division of Pediatric Orthopaedics

Two physical therapists at GF Strong Rehabilitation Centre, Kelly Hiller and Ian Denison, came to me two years ago wondering how they could study whether the Segway Human Transporter could be used by people with mobility impairments. There was no research to indicate what physical requirements a person needs to operate a Segway, yet we thought it might offer significant opportunities for disabled persons. We received funding from the *In it for Life* fund through Vancouver Coastal Health to determine physical and functional predictors towards successful operation of a Segway.

We invited participation from anyone (aged 19-65) with a mobility impairment who could walk six metres either independently or with assistance. We involved people with multiple sclerosis, Parkinson's, amputations, arthritis, incomplete spinal cord injuries, etc. The surprising finding was that all these people



Asst. Prof. Bonita Sawatzky shows how a Segway allows a disabled person to stand tall while getting around.

PHOTO: COURTESY BONITA SAWATZKY

were successful using the Segway. People who had significant difficulties walking were now whizzing around on the Segway.

Our attention turned to possibilities for more involved disabilities. After much debate among the researchers, one of our subjects with no muscle function or sensation below the chest managed to get on a Segway and operate it safely. This individual has since bought his own Segway and this is the first year he has gone "hiking" and camping with his family. It's changed his life – people don't even know he's disabled when he's riding by on the Segway. He stands high and tall and can look people straight in the eye instead of constantly scanning the ground, hoping he won't trip over a small pebble.

Our challenge now is with gaining access for these individuals to use the Segway just like a power wheelchair in public. Currently, there are restrictions to using a Segway on sidewalks and indoor shopping centres for able-bodied individuals. We are focusing our attention on ways to gain access for Segways used by disabled people. **R**

...people don't even know he's disabled when he's riding by on the Segway. He stands high and tall and can look people straight in the eye instead of constantly scanning the ground, hoping he won't trip over a small pebble.

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