



Drugs and substance abuse

SFU solution: public health, not law enforcement

Cannabis is by far the most widely used illegal substance, accounting for more arrests than any other drug. Studies show that in many settings, more Canadian teenagers smoke pot than cigarettes, yet unlike tobacco, marijuana is completely absent from any public health campaigns. SFU health sciences professor Benedikt Fischer has coauthored a new book, *Cannabis Policy: Moving Beyond Stalemate*, that attempts to tackle this problem. As one of only 15 CIHR/PHAC funded Chairs in Applied Public Health across Canada, Fischer specializes in psychoactive substance use and public health.

“Forget about the criminalization of substance use. That’s an anachronism. The main thing I’m trying to do is think about substance abuse as a health issue,” says Fischer. He wants to take morality out of the question. “Forget about sin and losing control. Think of it like we think about nutrition or exercise,” he says. “We don’t fight diabetes with the police. We deal with it as a health problem, even though many diabetics got that way by making bad lifestyle choices, the same as most drug addicts.”

Working with BC provincial health officer Perry Kendall, the Canadian Public Health Association and many others, Fischer is developing a set of Lower Risk Cannabis Use Guidelines. Based on solid scientific evidence, they will be similar to existing guidelines for tobacco use. The focus will be on modifying behaviours to reduce health harms by suggesting changes in use patterns and practices, or by using safer implements.

While Fischer has focused primarily on illicit drugs such as cocaine, heroin and cannabis, increasingly he finds prescription drugs are also being misused. His most recent paper, published in the December 2009 *Journal of the Canadian Medical Association*, commented on a substantial increase in number of deaths involving prescription opioids such as oxycontin and Percocet

in Ontario. Those deaths correspond with increased prescribing of these drugs by doctors. “People are getting these drugs from people in white coats,” says Fischer. “It’s a totally new challenge. These are legal products with a legal supply and legitimate patients, but you still have abuse issues.” The solutions are even more complex than safe injection sites for heroin addicts. Pain care is an important and sensitive field. “You can’t just outlaw oxycontin,” says Fischer. “You would do more harm than good. The challenge is to find the right balance in the interest of public health.”

Yet for some reason Canada is a world leader in painkiller use, with five times the prescription rate per capita as the UK. Fischer thinks these high rates might have something to do with the entrepreneurial nature of Canadian doctors. “If a woman comes into your office in a lot of stress, with four kids, a husband who is out of work, and complains of pain, you can make that go away with a painkiller, but it’s a lifestyle problem. You can spend time with her discussing lifestyle change, but writing a ‘script is just easier,” he says. “Sometimes I wish there was a billing code for avoiding writing a prescription, which actually would make a lot of sense,” says Fischer.

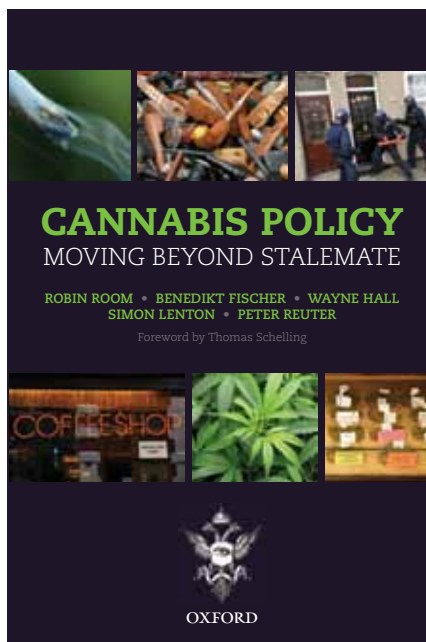
The push to prescribe drugs is caused by many factors. Heavy marketing efforts by drug manufacturers dovetail with patients who just want doctors to “cure” them quickly with a new pill. Time is another big issue. Our present health care system doesn’t reward doctors or patients for taking the time to conduct comprehensive assessments, and to plan and administer more complex interventions. “It’s a multidisciplinary, multi-faceted problem,” says Fischer, which is the main reason he enjoys his research. “I like bringing all these different strands of knowledge together,” he says, but most doctors simply do not have the time or expertise.

Born in Germany, Fischer was educated at the University of Konstanz before going to the University



Michael Berdan

Benedikt Fischer, SFU professor of applied public health, is co-author of a new book on cannabis policy published in March by Oxford University Press.



Message from the Vice-President, Research From Discovery to Innovation



Greg Ehlers, LIDC

Dr. B. Mario Pinto
V.-P., Research

Innovation is driven by the discovery process. It is the prepared mind that recognizes the potential for innovation under the three scenarios of conception, misconception, or accident. There are many examples of curiosity-driven research that result in discoveries that advance knowledge and lead to innovation and commercialization. A case in point is Ted Maiman's discovery of the laser fifty years ago that has had profound scientific and societal impact.

Our significant investment in the provision of research personnel and state-of-the-art infrastructure is clearly having a positive effect on the ability of our faculty members and students to secure research grants and scholarships to further their research programs. In the latest NSERC Discovery Grants competition, SFU enjoyed a success rate of 67% compared to the national average of 58%—and we ranked fourth in the country in terms of the average grant size (about \$38,000). We did very well in the Research Tools and Instruments competition, with a success rate of 36% as compared to the national average of 29%. As in previous years, our

researchers also fared much better than their national counterparts (41% versus 34%) in securing SSHRC standard grants. However, we were less fortunate in this year's CIHR operating grants competition, obtaining fewer grants than the national average (15% versus 20%).

Administered by the Dean of Graduate Studies, we have created a new SFU/VP Research Undergraduate Student Research Award pilot program to increase opportunities for student research. It will provide 16 weeks of research training to undergraduate students in the sciences and applied sciences and in the social sciences and humanities. The trainees will receive awards of \$2,250 or \$4,500 depending on whether or not they are enrolled in coursework during the tenure of the award, to be supplemented by an additional ¼ support from supervisors' grant funds. This program complements those for graduate student research support and transfers the research experience to an earlier stage of development.

Our new Strategic Research Plan, which has now proceeded through all levels of university administration, is firmly rooted in fundamental, theme-based research that holds the key to discovery.

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of Toronto for a Ph.D. in criminology. He stayed in Toronto for 15 years working at the Centre for Addiction and Mental Health. A few years ago he moved to the University of Victoria, but was attracted to SFU's new Faculty of Health Sciences with its focus on public health.

Since September 2008, Fischer has been at SFU continuing his work to defuse the often volatile relationship between public health and substance abuse. Vancouver's controversial but wildly successful safe-injection site is a typical example. "Why do people generally assume that substance abuse is against public health?" asks Fischer. "They want abstinence and prohibition, but that is not realistic."

Of course public health would be well served if prohibition worked, but Fischer points out the realities: drug use exists and it's not going away. And our current system of control and enforcement just doesn't work. Yet he cautions against placing a too heavy expectation on safe injection sites. At a minimum, there are 5,000 drug injectors in Vancouver who give themselves doses about four times a day. That's 20,000 injections per day. The safe injection site can accommodate about 250 per day. "That's just over one percent. Even if all those people change their behaviours, that still doesn't do much," says Fischer. Also, the sites focus on harm reduction and disease prevention. "By limits of their design, they cannot eliminate the black

market for drugs at hugely inflated prices that makes addicts rob cars and turn tricks," says Fischer.

So is there no way out? According to Fischer it's all about facing up to facts. Bad public policies are often ignored with the burden always placed on users. But repressive laws that force helpless addicts into dark alleys where they are in danger are equally to blame. "The idea is to minimize the impacts of the bad behaviour of both addicts and policy makers," says Fischer, who recently testified before the Senate Committee on Legal and Constitutional Affairs regarding Bill C15 on minimum

mandatory sentencing. Fischer would like to

see Canada go the way of Portugal,

which in 2001 became the

first European country

to officially abolish all

criminal penalties for

personal possession of drugs,

including marijuana, cocaine,

heroin and methamphetamine.

"Portuguese drug users are now sent for assessment and treatment instead of punishment," says Fischer. Drug use in Portugal did not increase. On the contrary, deaths from overdoses fell by half and about 10,000 addicts entered treatment programs. Money saved from law enforcement is now spent on health care.

Most drug addicts have mental health issues and they are just self-medicating. Fischer believes that it is time society adopts a sensible perspective for substance use: public health, not law enforcement. ■

**Money
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Switching from academics

Developing products goes beyond curiosity driven research

Trying to run a spinoff company is a huge challenge,” says SFU chemistry professor Neil Branda of Switch Materials Inc. “The culture and the goals of a company and a university are completely different.”

The company’s technology is based on a class of new organic molecules that Branda discovered about ten years ago. Switch Materials develops new products based on proprietary molecules that “switch” optical properties on command. When exposed to ultra-violet (UV) light, they quickly change from colourless to dark blue, but when stimulated with a small electric current, they instantly turn clear again. Applications include automobile sunroofs, variable shade sunglasses, photochromic inks and paints, high-density optical storage systems, molecular sensors and even biomarkers for labeling and tracking living cells.

It all began in the 1990s when Branda was searching for a way to make electronic circuit components that could conduct electricity at the molecular level, millions of times smaller than today’s microchips. He needed to find organic (carbon-based) molecules that could carry a charge. Working with graduate students, Branda found a material that accepted a charge when activated by UV light. It also turned dark blue. However when he tried running current through the conducting molecules they immediately lost their ability to conduct and turned clear again. While he failed to meet the goals of that line of research, Branda recognized the potential of this new phenomenon and has been studying it ever since.

Commercial photochromic organic molecules are responsible for transition eyewear, but they take time to adapt to changing lighting conditions. Electrochromic materials also exist in products such as e-book readers. Branda’s invention is unique because it behaves both photochromically and electrochromically. This means that transition eyewear could be made clear, even in bright sunlight, with the touch of a hidden button on the eyeglass frame.

Branda began publishing his discoveries around the year 2000 after applying for patent protection. “In academics every result is interesting, and that’s a good thing, because students should be encouraged to pursue every discovery,” says Branda. By 2004, SFU’s University/Industry Liaison Office (UILO) had filed for international patents. According to Ziba Afshar, UILO technology manager, “We were particularly encouraged by the number of enquiries we received about this technology, so in 2006 we recommended Switch Materials be incorporated to conduct product development.”

But a company doesn’t have the luxury to pursue every fascinating research result. “Our scientists have to work toward marketable products,” says Branda. A student can publish a thesis based on switching a molecule back and forth 10 times from clear to coloured. But a company has

to show the product will be stable after 50,000 cycles. “In my lab, company chemists and engineers find themselves surrounded by students whose projects are more curiosity driven than product or application driven,” says Branda. “That’s good for the student, but it’s not good for the company.”

UILO Director Mike Volker says, “We made a small investment through WUTIF,” referring to the Western Universities Technology Innovation Fund. “Mike was amazingly helpful and instrumental in getting the first round of financing,” says Branda.

CEO Doug Wiggin took charge of Switch Materials in May 2007 when new investors brought him in. He found it difficult running the company at first because all of the workers were graduate students. “I was a CEO with no real employees,” says Wiggin. “The problem with students is their primary focus is completing their degree. We were appreciative of their contribution in the early stages, but ultimately we needed workers whose objectives were totally aligned with the company.” The situation has since improved and Switch now has 10 full-time employees. The lab was moved from SFU to a new facility in Burnaby, and the company is currently working on a second round of financing. “More than one Fortune 500 company has expressed interest in our molecules,” says Wiggin.

Branda wants to do whatever is best for the company, which will also be best for the university. He says, “Even basic research can be driven by the desire to create new products.”

“Even basic research can be driven by the desire to create new products.”

pointing out that Canadian granting agencies now require scientists to forge collaborations with industrial partners. Yet nowhere in the granting process are academics required to submit true business plans. “Nor do they get credit for the number of hours they devote to spinoff companies or technology development,” notes Branda.

Switch Materials’ researchers have improved their proprietary molecules. “We started at 20 switching cycles and we’re now over 10,000,” says Wiggin. “We have to get it higher and we can.” Branda says it involves tweaking the compound mix embedding the photochromic molecules in a supporting matrix of plasticizers, polymers, electrolyte, charge carriers, adhesives and more.



Simon Gauthier demonstrates a photo-electrochromic window. Gauthier received a BSc in Chemistry from SFU in 2004 and now works as a research scientist at Switch Materials Inc. in Burnaby, BC.

French means diversity at SFU

The only place in the West to offer a doctorate totally in French



Greg Ehlers, LIDC

De gauche à droite: Ghizlane Laghzaoui, étudiant; Pierre Senay, étudiant; Betty Chin, Assistante aux programmes en éducation au BAFF (OFFA); Paule Desgroseilliers, étudiante.

It's Friday night and the 13 students in the first cohort of SFU's French Doctorate of Education program are tired and they say so, in French. For the last two years, they have spent most of their Friday evenings and Saturdays at the Vancouver campus taking classes such as "Ethics, Law & Professional Leadership" totally in French. As all of them are working professionals, and many have to commute into Vancouver by ferry or plane, they are usually exhausted by the time they arrive. "The first thing we do is eat. This always helps," says Diane Dagenais, one of the four professors from the Faculty of Education who teach in the program.

This is how it is if you live in places such as Washington State, Kamloops, Victoria or Vancouver and you want to do your doctoral degree totally in French, because it's the only program of its kind in Western Canada. The program is modeled after the Doctorate in Educational Leadership in the Faculty of Education, but all courses, assignments, lectures and theses are done completely in French. Two years of courses are followed by a few years of thesis work. All graduates receive an Ed. D. degree.

The idea for this program was first raised at a meeting in 2005. "We were approached by a group of

Francophone school district representatives who told us there was a critical need for such a program," says Claire Trepanier, Interim Director of the Office of Francophone and Francophile Affairs. Many French-speaking community leaders in Western Canada are working professionals such as school principals, superintendents or school-board administrators. They have high-powered jobs and are well established in their communities, with families and social ties. It's unrealistic for most of them to go to Eastern Canada to study toward a doctorate all in French. "When we opened it up for admissions, there were applicants from many places, even some from Washington State," says Dagenais. The first cohort started in 2007 and students are now completing their theses. The next group begins in January 2011.

The program is unique in the way it examines a broad variety of topics related to diversity in educational contexts. Doctorates in French typically focus on language and literature, but the Ed.D. cohort en français students go beyond this to research immigration, multiculturalism, bilingualism, and any number of educational issues involved in managing diversity.

According to Marianne Jacquet, another professor who teaches in the program, classes are fascinating because the students are so eager to share their real-life problems managing change in organizations with a lot of cultural diversity. They discuss controversial issues such as how to accommodate different religious needs in school contexts. "We used case studies to explore this issue in multiethnic school settings, and to learn more about the legal, policy and educational frameworks.

"These are senior administrators who are very committed to the people they serve as well as to each other, and to improving the conditions for Francophones in BC."

What could we do to make links between theory and practice?" says Jacquet. "These are senior administrators who are very committed to the people they serve as well as to each other, and to improving the conditions for Francophones living in BC," says Dagenais. For example they want to ensure that French learning materials are readily available in their communities.

"We've had a lot of enthusiasm in the Faculty and lots of support from the administration," says Dagenais. She loves the way the program is built upon SFU's expertise in cultural, linguistic and religious diversity. Learn more at the website: www.sfu.ca/educfr/en/Doctoral-Degree. ■

Fair use of cultural IP

SFU leads a global initiative to improve cultural heritage research

Gone are the days of Indiana Jones when an archaeologist could trek into some undiscovered jungle paradise, seize some priceless relics and leave a trail of destruction in his wake. Increasingly, today's researchers are more aware of the ethical and legal issues surrounding the recovery of cultural artefacts. Some researchers even take a community-based participatory approach by involving the locals. "We need to let go of control," says George Nicholas, SFU professor of archaeology who keeps a classic old photo of pith-helmeted explorers on his bookshelf as a reminder. "It used to be archaeologists would show up at a site and say, 'We'll be doing this.' Now it's more like, 'You tell us what we can do,'" he says.



Nicholas leads a project called IPinCH (Intellectual Property Issues in Cultural Heritage), an international research initiative based at SFU, which includes more than 50 scholars and 26 partner organizations all over the world. Nicholas developed the idea with colleagues Julie Hollowell (Indiana U.) and Kelly Bannister (U. Vic) and funded it with a seven-year \$2.5M Major Collaborative Research Initiative grant from Canada's Social Sciences and Humanities Research Council. IPinCH partner organizations range from the Inuvialuit of the Northwest Territories and the Moriori people of Rekohu (Chatham Islands, New Zealand) to Parks Canada and the World Intellectual Property Organization (Geneva) to dozens of others with an interest in cultural intellectual property (IP) issues.

Nicholas stresses that cultural IP is not like traditional IP such as copyrights and patents. It's more sensitive, and no formal mechanisms protect it. A couple of years ago at an archaeology conference in Dublin he was chairing a session on IP issues in cultural heritage. An Australian researcher working with local community groups showed photos of pictographs (images painted on rock) in her presentation. At the end of her talk an Aboriginal man stood up at the back and said, "How dare you show these images. Do you realize I could be killed now?" For this man, the projected images were no different from seeing the real pictographs. Such cultural IP often represents important intangible values; spiritual and religious connotations with consequences that are often not fully appreciated by Westerners. In this case, the images were meant to be seen only by people within that culture who had attained certain rites of passage. The traditional penalty for premature viewing was death.

"My colleague was dumbfounded. She felt she was working with the community and she thought she was doing the

right thing," says Nicholas. IPinCH is meant to prevent such misunderstandings and to promote good practices by developing protocols for researchers working with Aboriginal groups. "For many indigenous peoples, ancestral beings are still here right now. Even if the rock art was carved 5000 years ago. They don't have the same distinction with past, present and future as we do," says Nicholas. IPinCH will contribute knowledge, document issues and explore best practices so that indigenous communities and others understand how to protect cultural heritage.

"We can't always come to an understanding by looking from the outside in," says Nicholas, who has spent a lifetime studying Aboriginal cultures. (Currently he is developing an IPinCH project with the Ainu people of northern Japan.) "It's a way for me to take all my knowledge and help improve

"We can't always come to an understanding by looking from the outside in."

people's lives today by developing more equitable models." He points to the controversial use of genetic techniques for cultural archaeological studies. Indigenous people can be threatened by DNA analysis that might contradict aspects of their heritage beliefs. Other issues involve the explosion of virtual museums, which make digitally reproduced materials available to a global audience, or modern techniques of 3D copying and printing that can allow the sale of perfect copies of rare cultural artefacts. "We've got to catch up," says Nicholas, "and we have to do it by putting descendant communities in the drivers seat." IPinCH research is also examining cultural tourism, bioarchaeology and much more. "We are even studying how to identify and resolve conflicts between researchers themselves," says Nicholas. ■

Professor George Nicholas shows the old fashioned tools of his trade that have been augmented by more modern methods, including DNA analysis and community-based negotiations to establish equitable terms for archaeological research and cultural intellectual property issues.

Australia's Griffith U. signs MOU

Two similar universities agree on research collaboration



Greg Ehlers, LIDC

From the left: Griffith University President Ian O'Connor, Queensland Premier Anna Bligh, and SFU V-P, Research Mario Pinto.

On May 1, SFU Vice-President, Research Mario Pinto and Griffith University President Ian O'Connor signed a memorandum of understanding for research and scholarly collaborations between the two institutions. Dignitaries including the premier of Queensland Anna Bligh attended the formal signing ceremony at the Burnaby campus.

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The Office of Research Services regularly publicizes research funding opportunities for SFU faculty members. Please visit: www.sfu.ca/ors/funding_opp.html

Librarian hat-trick

University Librarian and Dean of Library Services Lynn Copeland will be stepping down from her position in just a few months. She recently won three awards including the Canadian Library Association's Outstanding Service to Librarianship Award for 2010. "This is the highest award of Canada's national library association," says Gwen Bird, SFU Library's head of Collections.



Copeland

Copeland also won the Helen Gordon Stewart Award from the BC Library Association, recognizing "an outstanding career in librarianship involving visible or readily identifiable achievements that bring honour to the entire profession." It includes Honorary Life Membership in the association.

Finally, from the Canadian Association of Research Libraries, Copeland received the award for Distinguished Service to Research Librarianship. "I'm thrilled to be honoured in this way, but it's not me winning this award, it's all the wonderful people that work in the library," says Copeland. ■

The two universities have many similarities. They are both medium-sized institutions with multiple campuses. Griffith has five campuses in the Brisbane area on Australia's Gold Coast. The main campus of Griffith U. is even located on top of a mountain.

According to Pinto, the Queensland government wanted to intensify research collaboration with British Columbia. "Griffith approached us and we found we had so much in common, even including our matching red university logos," says Pinto. Griffith had done a careful scientific analysis of all Canadian universities. "They selected SFU because they wanted to learn from and emulate some of our qualities," says Norbert Haunerland, Associate VP Research.

Complementary areas of research strength were identified, including drug discovery, environmental studies, Asian studies, forest management, forensic science, and the behavioural and cognitive sciences.

At this time, faculty exchanges are not planned. Instead, the focus will be on sharing knowledge, graduate students and technologies. ■

Award Winners

Congratulations to our recent research award winners:

- Andy Hoffer, Biomedical Physiology and Kinesiology - Lifesciences BC's Innovation & Achievement Award.
- Rob Holt, Marco Marra and Steven Jones, Molecular Biology and Biochemistry (Michael Smith Genome Sciences Centre) - Lifesciences BC's Genome BC Award for Science.
- Mark Wexler, Business Administration - CUFA BC's Paz Buttedahl Career Achievement Award.

Congratulations also to three *best paper* award winners from the Faculty of Business Administration:

- Gervase Bushe, 2009 Douglas McGregor Award for a co-authored 2009 *Journal of Applied Behavior Science* article.
- Rekha Krishnan, 2009 Verity International Award for Overall Outstanding Paper in Management for a co-authored 2009 *Canadian Journal of Administrative Sciences* article.
- Tom Lawrence, 2010 Greif Research Impact Award for a 2004 *Academy of Management Journal* article.

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Switch Materials now develops products in their own laboratory located off campus, but they still make use of the state-of-the-art analytical and clean room facilities at 4D LABS, SFU's new \$40 million materials science research centre, where Branda is Executive Director. ■