

## May | Brian Christie, Neuroscientist

### Who are you?

My job title says I am an Associate Professor and Michael Smith Senior Scholar in the Division of Medical Sciences and the Island Medical Program at the University of Victoria, but really I'm a dad to three very cool kids and enjoy coaching them in hockey, lacrosse, soccer, running, etc.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

My research focuses on how different neuropathologies affect the functional and structural capacity of the brain. We study a few developmental disorders, including: Fetal Alcohol Spectrum Disorders, Autism and Fragile-X Syndrome, as well as adult disorders like Huntington's Chorea and Alzheimer's disease. Our goal is to develop treatments that will improve the structural and functional capacity of these brains and improve the quality of life for individuals that are afflicted with these disorders.

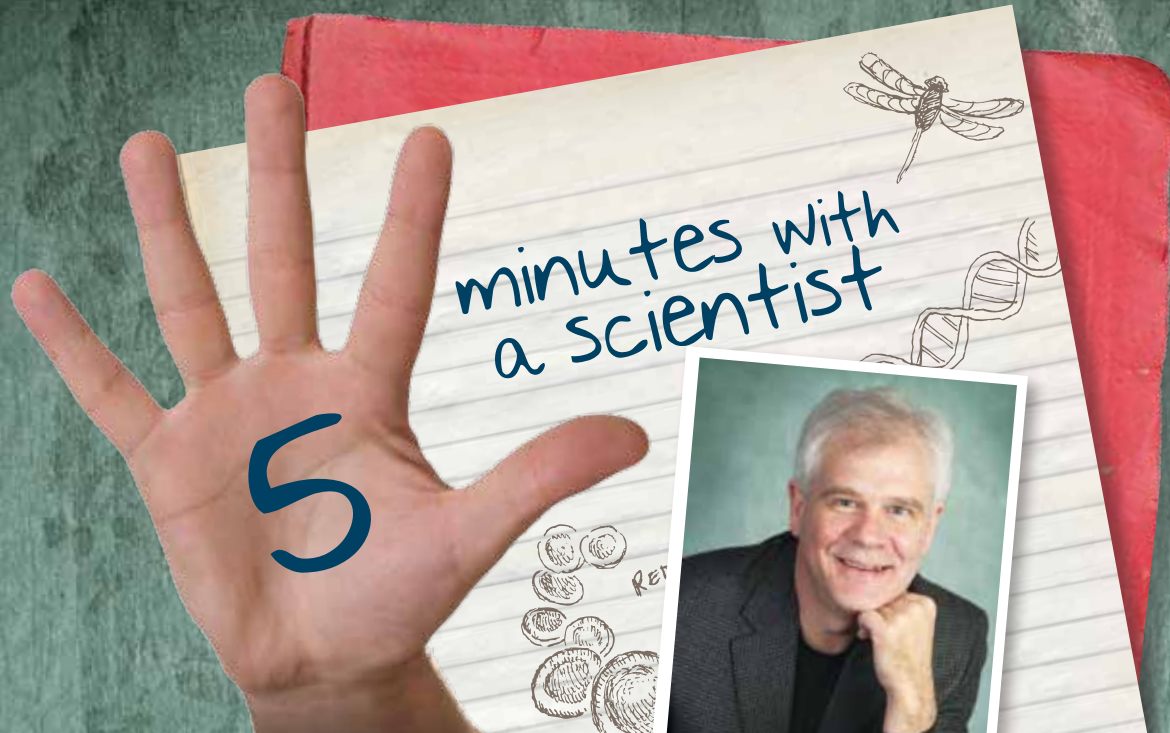
### What is the most important thing you have found out? And why is it important?

We have shown that exercise increases the production of new cells in the brain and that this also improves learning and memory performance. This work is important because it shows that the brain is much more dynamic than we previously thought, and that you can induce structural and functional improvements in certain regions with aerobic exercise. We are currently moving this work to trials in human children with Fetal Alcohol Spectrum Disorders.

### What advice do you have for a young person wanting to pursue a career in your field?

Don't be afraid to ask tough questions and make sure you try everything out so that you can make informed decisions when you decide what you want to do with your life.

To learn more about Brian Christie visit <http://web.uvic.ca/~cni2007/index.html>



## May | Michael Hayes, Public Health and Social Policy

### Who are you?

I am the Director of Health Research and Education at the University of Victoria, and I am a professor in the School of Public Health and Social Policy and in the Department of Geography and in the Division of Medical Sciences. My training is in epidemiology and geography. I am interested in understanding why health outcomes in populations follow a systematic pattern referred to as a social gradient.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

Understanding patterns of health outcomes in populations points to the significant role the circumstances of our daily lives have in shaping health experiences. The interplay of income, education, occupation, marital status and several other social characteristics systematically influence health outcomes across virtually all diseases. My work, and the work of the thousands of others around the globe studying population health outcomes, strongly suggests our provincial and federal social policies are not in line with the factors that shape health outcomes. This is particularly surprising because we spend so much money on health care in Canada.

### What is the most important thing you have found out? And why is it important?

Investing in disease prevention focused on basic conditions of daily life – stimulating and licensed child care early in life, in education, housing, addressing poverty, and in other programs to support people to meet their full potential – will lead to far better health outcomes than investing in disease treatment and searches for cures. This is important for the longer-term sustainability of our culture.

### What advice do you have for a young person wanting to pursue a career in your field?

Be passionate about what you do and clear about why you are doing it.

To learn more about Michael Hayes visit <http://geography.uvic.ca/people/faculty/hayes.php>



## May | Stephanie Willerth, Biomedical Engineer

### Who are you?

I am an assistant professor of Biomedical Engineering at the University of Victoria. I work with both the Department of Mechanical Engineering and the Division of Medical Sciences and I use both biological and engineering knowledge to solve health related problems.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

My research focuses on using stem cells to produce tissues found in the body to serve as replacements for diseased and damaged tissue. Specifically, I am designing and developing replacements for the tissue found in the central nervous system. I hope that this work will eventually lead to an effective treatment for spinal cord injury.

### What is the most important thing you have found out? And why is it important?

I demonstrated that it was possible to culture embryonic stem cells and differentiate these cells into neural tissue inside of 3D scaffolds made of fibrin, a blood derived protein. Fibrin is the protein that clots blood (i.e. when you cut yourself and the wound forms a scab due to fibrin polymerization) and it is commonly used as surgical glue. Such a strategy could eventually be used to treat human patients suffering from spinal cord injuries.

### What advice do you have for a young person wanting to pursue a career in your field?

I would say that it is possible to study engineering, specifically biomedical engineering, and apply this knowledge to solving health related problems. In terms of what students would need to take in high school, I would recommend taking classes in mathematics, biology, chemistry and physics.

To learn more about Stephanie Willerth visit <http://www.engr.uvic.ca/~willerth/people.shtml>



## May | Francis Nano, Microbiologist

### Who are you?

I am Professor of Biochemistry and Microbiology. I am a microbiologist who uses microbial genetics to understand the properties of bacteria, especially bacteria that cause diseases.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

To understand the significance of my research one has to appreciate that most biological processes are generally applicable to a wide variety of organisms, and this is especially true in the area of microbiology. One area of my research focuses on a collection of proteins that secrete proteins from bacteria. In bacteria found in nature this "secretion" system is thought to play a role in microbe-microbe competition. In bacteria that cause diseases in humans this system disarms parts of the immune system.

I also use the evolutionary conservation of protein structure and function to help make vaccines. My research group has shuttled essential genes from Arctic bacteria into disease causing bacteria to make the latter temperature-sensitive, and thus act as a vaccine.

### What is the most important thing you have found out? And why is it important?

It is difficult to pick out the most important discovery. However, the most recent exciting finding of ours is demonstrating the usefulness of "Arctic genes" in constructing vaccines.

### What advice do you have for a young person wanting to pursue a career in your field?

For those individuals who truly love science, it is a passion that remains with you for life. There are always new challenges and new things to discover.

To learn more about Francis Nano visit <http://web.uvic.ca/~fnano/>



## May | Cecilia Benoit, Sociologist, and Centre for Addictions Research

### Who are you?

I am a Scientist at the Centre for Addictions Research of British Columbia and Professor in the Department of Sociology at the University of Victoria.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

Apart from ongoing research focused on the occupation of midwifery and the organization of maternity care in Canada and internationally, I am involved in a variety of CIHR (Canadian Institutes of Health Research) projects that employ mixed methodologies to investigate the health of different vulnerable populations, including Aboriginal girls and women in Vancouver's Downtown Eastside, female adolescents confronting health stigmas associated with obesity and asthma, homeless female and male youth, frontline service workers in female-dominated low-prestige and stigmatized occupations, women and men involved in the sex industry, and pregnant and early parenting women using addictive substances.

### What is the most important thing you have found out? And why is it important?

The most important thing I have found out is that social and cultural factors have an independent and persistent impact on inequalities in health between individuals and populations, and that "health inequities" or avoidable health inequalities have deepened in Canada and most other OECD countries in recent decades. These social and cultural factors (including social-economic status, gender, race & ethnicity, age, etc.) intersect and shape personal attitudes and behaviours to positively or negatively influence health status across the life course, resulting in unequal access to health care and other key resources.

### What advice do you have for a young person wanting to pursue a career in your field?

Sociology offers students a unique historically-informed analysis of the relationships between society and health outcomes, as well as an opportunity to become versed in quantitative and qualitative methods to study health inequities across the life course. Students will be trained to analyse large-scale population data sets while at the same time learning how to gather and analyse narratives of people in their own social context as avenues for in-depth understanding of how broader social forces impact individual health, as well as people's day to day efforts to resist the inequities they face.

To learn more about Cecilia Benoit visit <http://www.carbc.ca/> and <http://web.uvic.ca/~cbenoit/>



## May | Nigel Livingston, Can Assist

### Who are you?

I am the director of a program called CanAssist that develops technologies and provides a range of support services for people with disabilities.

I have a background in physics but then worked for a number of years in an area related to climate change—basically looking at how trees take up carbon dioxide and release water to the atmosphere. I used to spend a lot of my time designing and building environmental instrumentation.

After the birth of my youngest daughter, who has special needs, I switched directions and started CanAssist.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

I am involved in developing a range of technologies that can be used by people with disabilities – the idea being that such technologies improve their quality of life and independence. The technologies range from the highly complex to the simple. Thus for example, we have developed communication systems for people who are unable to talk or even more. An example of a simple project (but still very important for the user) is a device for a little girl with cerebral palsy that allows her to brush her hair (rather than have an aide do it for her).

### What is the most important thing you have found out? And why is it important?

When you are designing something for someone, you have to take the time to really understand their needs. That is the secret to good design.

### What advice do you have for a young person wanting to pursue a career in your field?

I always tell people that you have to be passionate about what you do. If there is not that inner passion then perhaps you are pursuing the wrong field. So if you are interested in a particular field make sure you talk to as many people in that field as possible. Once you have discovered that field, the rest is relatively easy, you will work hard and will get the results (i.e. the grades) you need.

To learn more about Nigel Livingston visit

<http://www.canassist.ca/EN/main/about-us/our-team/departments/executive/dr-nigel-livingston.html>



## May | Andrew Jirasek, Medical Physicist

### Who are you?

I am a Medical Physicist in the Department of Physics and Astronomy at the University of Victoria. I work closely with the physicists at the BC Cancer Agency, Vancouver Island Centre.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

My research mainly focuses on the radiation therapy of cancer. We work on i) developing tissue equivalent, three dimensional detectors for accurate radiation measurements of complex radiation therapy treatments, and ii) understanding the effects of radiation on cells, tumors etc.

### What is the most important thing you have found out? And why is it important?

We have been quite successful in our development of 3D detectors. This is important as it will allow physicists to make accurate dose measurements of new and complex therapy treatments.

### What advice do you have for a young person wanting to pursue a career in your field?

Keep an open mind to the possibilities that arise along your journeys!

To learn more about Andrew Jirasek visit <http://communications.uvic.ca/edge/jirasek.html>



## May | Peter Keller, Geographer

### Who are you?

I am a geographer who studies how maps and mathematics can be combined to help planners and decision makers determine policy, and reach decisions.

### What research are you doing here at UVic that contributes to our understanding of human health and wellness?

My research team models the geographical distribution and human exposure to pollution, in relation to both individual and population health. This allows us better to understand the complex relationship between human health and sources of pollution in our environment. Another research program involves mapping social determinants of health and wellness (like family structure, gender, physical activity, nutrition, graduation rates, smoking) in order to visualize the geographical distribution of wellness. This allows us to compare and understand how wellness and health vary with place. To find out more about the British Columbia Atlas of Wellness go to: <http://www.geog.uvic.ca/wellness/>.

### What is the most important thing you have found out? And why is it important?

Traditional methods of measuring and modeling the geographical distribution of pollution and their relation to people's health are inadequate to properly understand the relationship between health and people's living environments. Being able to map and model pollution in more detail as well as capture the finer details of people's daily movements is allowing us to gain new insights that will hopefully lead to a healthier society.

My mapping of determinants of wellness in the Wellness Atlas of BC shows what we have known for a long time, namely that healthy eating, being active and having a positive outlook makes for healthier people.

### What advice do you have for a young person wanting to pursue a career in your field?

Follow your passion and your heart, and listen to and follow-up on your creativity and your ideas even when others tell you that you shouldn't.

To learn more about Peter Keller visit <http://geography.uvic.ca/people/faculty/keller.php>