The *IDEA*logue

SCHOLARLY ACTIVITY NEWSLETTER • WINTER 2016

Langara.
THE COLLEGE OF HIGHER LEARNING.

Envisioning research in a whole new way at Langara's spring 2016 Scholarship Café

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SAVE THE DATE:
2017 SCHOLARSHIP CAFÉ

Thursday, March 30
11:30 am – 3:00 pm
T Building Gallery

Langara's Scholarship Café is an annual, open house-style event that showcases some of the most exciting scholarly research taking place at the College. The event is free and everyone is invited to attend.

www.langara.ca/scholarship-café

GET THE RECOGNITION AND SUPPORT YOU DESERVE

Have a great idea? Working on a community project or presenting a paper at a conference? Interested in partnering with someone from the Langara community to conduct research? We want to know. Contact us at 604.323.5690 or scholarlyactivity@langara.ca.

Picnic from hell: the invasive nature of European fire ants

Biology instructor Ken Naumann's first encounter with the subject of his Langara research project has all the elements of a 1950s sci-fi thriller – with a little Stephen King and Alfred Hitchcock thrown in for good measure.

"It was about 15 years ago," Naumann recalls. "A classmate of my daughter was having a birthday party, and they wanted to celebrate in a park next to the Fraser River. It's a beautiful spot with lots of room to run and play and have a birthday picnic.

"We all drove there. Van doors slid open, squealing girls jumped out and headed for the tall grass, while parents were left to set up the food."

Cue ominous music...

Suddenly, there were screams coming from a section of tall grass. Parents dropped half-filled bowls of potato salad and ran for the source of the commotion.

Girls were screaming, running in every direction, patting their pants, and hitting their legs. Within seconds, parents were doing the same thing. Everyone was being stung by tiny red ants.

Not just any ants. These were European fire ants (*Myrmica rubra*). They are aggressive and will defend their nest vigorously if disturbed. The girls had obviously disturbed a nearby colony.

Naumann was fascinated. With the help of a $3,000 Langara RSAF grant, he began studying these ants three years ago.

"These guys are packing," says Naumann. "Their sting hurts. It's like getting a face full of vinegar. The injury site will usually swell up, which can be a serious problem for anyone who is allergic. And unlike bees, fire ants don't die after they sting."

Fire ants were introduced to the east coast of North America in the 1900s, and became newsworthy in BC in 2010. How they crossed the continent is one of the questions Naumann and co-researcher Mario Moniz de Sa, chair of Langara's Biology department, hopes to answer.

> ***The European fire ant is considered the "big box retailer" of the insect world.***

Ants can be easily transported through infested soil, mulch, garden materials, and even potted plants. Naumann considers the European fire ant to be the "big box retailer" of the insect world. Once they move into a neighbourhood, they displace all other ants by virtue of sheer numbers.

Naumann and Rob Higgins, a co-researcher from Thompson Rivers University, have established that biodiversity in an area drops dramatically with the presence of fire ants. They simply overwhelm all other ant species.

"Fire ants are also comfortable with very high population densities," Naumann says. "Each colony can have several queens, not just one. These queens often establish their own colony less than a metre away from the original. It's called 'colony budding'."

Recent developments in gene sequencing have revealed more fire ant secrets. Using behavioural assays and DNA extracted from various colonies, Naumann, Moniz de Sa, and several students have found genetic links between colonies that are geographically miles apart yet somehow linked. The research team is looking forward to further study of these "super colonies."

Say hello to the European fire ant

Close-up of fire ant stinger

ABOUT LANGARA'S RESEARCH & SCHOLARLY ACTIVITY FUND (RSAF)

In November 2015, Langara's Scholarly Activity Steering Committee established a new funding opportunity to support faculty-led research projects. The RSAF inspired several diverse projects in its inaugural year, the outcomes of which are featured in this edition of *IDEA*logue.

For more information about the RSAF, including deadlines for proposals and the submission process, visit http://iweb.langara.bc.ca/rsaf.

Photos: California Academy of Sciences, www.AntWeb.org

Tofino: At the end of Esowista Peninsula

Langara instructor looks to Long Beach past to divine its future

Long Beach. Chesterman. Cox Bay. Wickanninish.

For many of us, these names evoke idyllic images of sun, sand, and surf. These beaches near Tofino on Canada's west coast are a playground for thousands and, for a few lucky Langara students, an amazing littoral laboratory.

Mark Smith is a geologist and instructor at Langara College. For years, he has brought a small group of students to the west coast as part of the Environmental Studies Field School at Langara, and to continue an ongoing project that examines the coastal geology of the Esowista Peninsula.

Smith looks at beaches differently than you or I, and he operates on a much larger time scale. For instance, those waves curling up and dropping, swirling sand at his feet – those could be the remnants of a wave that originated in Japan or Indonesia. It may have travelled hundreds of miles before it felt the sandy rippled bottom of Cox Bay, curled in upon itself, and broke, spreading sand and foam across the bay, then pulling it out again.

The rocky headlands that break up and separate this coast into its various beaches are mostly made of a volcanic rock called basalt. They are the remnants of the last ice age. When the ice receded some 10,000 years ago, these headlands were left intact.

Now clinging to their flanks are the remains of generations of marine creatures — barnacles, urchins, kelps, mussels. They grow, mature, and die in the inter-tidal zone, all the time pounded by wind and waves. Their remains are eroded and contribute sediment to the beaches.

The primary source of sediment for Tofino area beaches are the deposits of glacial sediment found along the coast and nearby rivers and streams. Streams as well as wind and wave action move these sediments onto the beach where they become part of the coast. It's these glacial deposits that Smith is most interested in because many are no longer available. Ocean waves can no longer reach them, and the sustainability of the beach may be in question.

> ***By looking at the distant past and gathering data about the present, Smith and his students hope to shed some light on the future of Canada's west coast.***

Smith realized that very little work had been done in this area, and that this was an opportunity to gather information and better understand the immense forces at work. A $1,200 Langara RSAF grant helped Smith and his students gather data to answer the most basic questions. Smith continues the research mostly on his own, with help from students back at the College.

By looking at the distant past and gathering data about the present, Smith and his students hope to shed some light on the future of Canada's west coast.

Langara seizes “hopportunity” to help BC’s craft beer industry

By the end of 2016, the number of craft breweries in BC is expected to reach at least 130. In a word, the craft brewing industry is booming, and so are the industries that support craft beer production.

Hops are now an economically important crop in the province. Hops are primarily used to give beer its characteristic aroma and bitterness. There are about 125 different varieties of hops. Each imparts a unique flavour to the beer being brewed.

Correctly identifying varieties of hops based on morphological characters alone can be difficult. An efficient and reliable DNA marker-based method is needed. This is essential if the craft beer industry is to continue offering a consistent, high-quality product.

Langara Biology instructor (and beer lover) Ji Yang is proposing a bioinformatics solution to the problem.

“With help from a student from Langara’s Student Work Assistance Program (SWAP), we are going to sequence the entire chloroplast genome of 10 popular varieties of hops,” Yang says.

“DNA samples will be run through a high-output, gene-sequencing machine. The goal is to use the results of that sequencing to find DNA markers that could distinguish the different varieties of hops.”

Another piece of the puzzle: the Monte Palazzi excavation

Pulled from the ground in 2007 at Monte Palazzi — a remote archaeological site high up in the hills of southern Italy — these are much more than just broken pieces of pottery.

With Jennifer Knapp’s skilled hands and sharp eyes, each shard becomes a piece of a giant puzzle, a window into a way of life 2,500 years ago when Italian, Greek, and Roman city states vied for control of this strategic peninsula in the Mediterranean.

“Ceramics are often used as material for dating an archaeological site,” says Knapp, a Classical Studies instructor at Langara College and an active participant in the Monte Palazzi dig. “But if we look closely at those pieces, and the vessels they were part of, we often find they tell a story. They can reveal what food the people ate and how they made it. The implements used to prepare food have certainly changed over the years, but food expresses identity now as much as it did 2,500 years ago.”

“Sometimes we find vessels used for storage,” Knapp adds. “These can help reconstruct trade routes. Pieces of more decorative vessels might indicate the house of a person of rank, or the presence of a temple.”

Knapp and a student started going to the Monte Palazzi site in 2005. Knapp believes it is important for students to be involved in archaeological training as early as possible because it gives them a chance to get first-hand training in archaeological digs and learn what it is like to be on excavation.

“It’s tough work,” she says. “But it can be very rewarding as well.”

With the help of an RSAF grant and a student, Knapp spent the summer of 2016 at home digging through her notes and digitizing everything. These databases will become vital information for future archaeologists, as they continue to find more pieces of the puzzle that is gradually being unearthed in southern Italy.

Cooking lid

Cup base

Pottery pieces

Photos: Jennifer Knapp. Published by permission of the Foundation for Calabrian Archaeology.

Langara instructor and project lead Kim Lam tests Wi-Fi signals with project aide Edmond Wong.

$25,000 NSERC Engage Award enables wearable Wi-Fi project

Kim Lam is working with Vancouver software developer Vandrico on a project that, when completed, could make the workplace safer for thousands of employees.

Lam is the coordinator of Langara's Computing Science & Information Systems (CSIS) program. Working with project aides Calvin Heu and Edmond Wong, Lam is designing a smartphone and app that an employee can wear. The device would track the employee's movement in an industrial Wi-Fi network – a mine, mill, or complex construction site, for example.

Says Kenny MacKenzie, President of Vandrico, "We are very excited to be working with Langara to advance the capabilities of indoor and underground location tracking using wearable technology."

Their project has attracted some major interest. In May 2016, the team received a grant of $3,000 from Langara's RSAF. Earlier this year, with help from Kelly Sveinson and Langara's Community & Industry Research Centre (CIRC), Lam's project secured an Engage Award of $25,000 from the Natural Sciences & Engineering Research Council of Canada (NSERC).

Lam is working on the algorithm, while Heu and Wong are scrambling to finish the application.

"We wanted something off the shelf, something with no special hardware, something for the real world," says Lam. "After all, we have a real client and real deadlines."

"We want to start trials of a test unit by mid-December 2016. No pressure," he adds, grinning and turning back to his screen.

> *"We are very excited to be working with Langara to advance the capabilities of indoor and underground location tracking using wearable technology."*
>
> *– Kenny MacKenzie, President Vandrico Solutions Inc.*

Update from the Langara Cannabis Research Group

There is no shortage of opinion in North America when it comes to cannabis. Opinions vary widely on the subject of its use and abuse. Emotions run high on both sides of the debate, as well as both sides of the border.

Some jurisdictions — like Colorado, Oregon, and Washington — are pushing ahead to legalize and monetize marijuana as fast as possible. Some estimate the US market alone is worth $71 billion. Politicians, on both sides of the border, are attracted by visions of cash pouring into state coffers.

While opinions are plentiful on both sides, there is a dearth of basic research and factual information on the effects of cannabis use and misuse.

For the last two years, an interdisciplinary team of scientists at Langara College —the Langara Cannabis Research Group — has been attempting to fill this knowledge gap.

Langara's Cannabis Research Group comprises:

- Kevin Craib, Mathematics
- Janet Douglas, Social Service Worker
- Mario Moniz de Sa, Biology
- Margo Nelson, Social Service Worker
- Daryl Smith, Biology
- Paul Sunga, Health Sciences (principal investigator)
- Kelly Sveinson, Chemistry

Members of the group have spent two years working on the first two-of- five projects, and they are about to release the findings of the first project:

- Social and fitness surveys of college students (Nelson, Smith, Douglas, Moniz de Sa, and Sunga)

Meanwhile, work is nearing an endpoint on a second project:

- Social and health surveys of BC baby boomers born 1946-1964 (Douglas, Nelson, Smith, and Sunga)

The third project, currently at the midpoint, is:

- Chemical analysis of cannabis strains and perceptions of effects (Nelson, Sveinson, Smith, Douglas, and Sunga)

A fourth project underway in the fall of 2016 is:

- Analysis of chemical profiles of samples of cannabis over two years (Sveinson, Craib, and Sunga)

This project includes external partners, and involves analysis of data from several years of measurements of active compounds in dispensary cannabis by a commercial laboratory.

> ***"Our intent is to make sure that the people who make decisions around this issue have the facts at their fingertips, and that they are making decisions based on facts, not on newspaper headlines."***
>
> ***– Paul Sunga, Principal Investigator, Langara Cannabis Research Group***

The group is currently designing a fifth project in conjunction with UBC:

- Clinical cardiovascular correlates of consumption of distinctly analyzed strains of cannabis (Sunga with external partner Dr. Simon Rabkin, UBC Department of Medicine)

Says principal investigator Paul Sunga, "It's particularly appropriate for a community college to be researching this subject. Drug use and drug effects are serious community health issues.

"As scientists, we are expressing our personal views on cannabis and its use. We are interested in challenging accepted wisdom through experimental means, while at the same time, contributing to extending knowledge about cannabis and BC society.

"Our intent is to make sure that the people who make decisions around this issue have the facts at their fingertips, and that they are making decisions based on facts, not on newspaper headlines."

Feed the good wolf: creating a smoking cessation iPhone app

RSAF

Feed the good wolf. This is the intriguing name of an app being created as an interdisciplinary project by Langara's Computing Sciences & Information Systems (CSIS) instructor Bryan Green and four students.

The app is being designed to help people quit smoking. Ironically, the inspiration for this high-tech project is an old Cherokee legend:

> An elder is teaching his grandson about life.
>
> "A fight is going on inside me," he says to the boy.
>
> "It is a terrible fight and it is between two wolves. One is evil. He is anger, envy, sorrow, regret, greed, arrogance, self-pity, guilt, resentment, inferiority, lies, false pride, superiority, and ego."
>
> "The other," the old man continued, "is good. He is joy, peace, love, hope, serenity, humility, kindness, benevolence, empathy, generosity, truth, compassion, and faith.
>
> The same fight is going on inside you – and inside every other person, too."
>
> The grandson thought about it for a minute and then asked his grandfather, "Which wolf will win?"
>
> The old man simply replied, "The one you feed."

According to Stats Can's 2014 report on smoking, a battle goes on everyday in the hearts and minds and neural pathways of 5.4 million Canadians — the 18% of our population who smoke.

The outlook is not encouraging — 75% of smokers want to quit; 50% tried to quit in the past year; 11% were successful.[1]

Green thinks most smokers underestimate the power of their addiction.

"If you are going to do something as dramatic and difficult as quitting smoking, you should marshal as many resources as possible, and you should "feed the good wolf."

With a $2,160 Langara RSAF grant in May 2016, the "Green Team" is applying First Nations wisdom, a little cognitive behavioural therapy, and smartphone technology to create an iPhone application that will increase people's chances of success in quitting smoking.

Some researchers claim that quitting smoking is more difficult than kicking a cocaine or heroin habit. However, "feeding the good wolf" has immense potential savings for the individual and the community at large.

5,700 people die every year from smoking-related causes. Smoking costs our province an estimated $525 million (2002) annually in medical care; an estimated $904 million (2002) in productivity losses due to the premature deaths and excess disability of smokers; and millions more in costs are borne directly by BC employers.[2]

The app will encourage the user to catalogue their behaviour and recognize patterns. It will help to "feed the good wolf" by creating an inventory of people and places that decrease tension and avoid situations that encourage smoking.

Case studies require Langara Research Ethics Board review

L/R/E/B

The Scholarly Activity Steering Committee and Langara Research Ethics Board have created a guideline for ethics review of case studies involving living humans. This is now available under the Policy and Guidelines tab on the LREB website.

Case studies are often described as "n of 1" studies because they involve a research investigation of a single living individual or sometimes a small series of individuals. The guideline clarifies that Langara researchers who conduct such case studies for scholarly purposes must submit an Ethics Review Application Form to the LREB for review and approval before recruiting case study participants. Langara instructors who have students design and conduct case studies in ways that are meant to replicate case study research on a living individual are required to have their courses reviewed by completing the Application for Course-Based Research.

Case studies are common elements of scholarly research programs. While they often do not answer specific research questions, they can be hypothesis-generating or be used to pilot-test theoretical models or experimental interventions. As such, they raise all the ethical issues of larger research studies, including issues around obtaining informed consent, protection of confidentiality, and minimization of risk to participants. Often these are raised in acute form since participants typically interact directly with researchers, sensitive information can be collected non-anonymously, and the research can be more than minimal risk.

Exception: LREB review is not required for student interviews with living persons that do not require students to design and attempt to replicate a case study investigation for research purposes. For example, LREB review would not be required for course work that requires students to gain experience of interviewing skills or to interview individuals to find evidence of current social or psychological theories.

Langara researchers or instructors who have any questions about this guideline can contact John Russell, LREB Chair, at jrussell@langara.ca or 604.323.5453.

1: http://www.tobaccoreport.ca/2015/TobaccoUseinCanada_2015.pdf 2. http://www.gpiatlantic.org/publications/summaries/costoftobacco-bc-summ.pdf

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Learn more.
www.langara.ca/scholarly-activity

Spring 2016 Scholarship Cafe

ABOUT SCHOLARLY ACTIVITY AT LANGARA

In a 1990 publication, *Scholarship Reconsidered*, Ernest Boyer introduced an academic model advocating expansion of the traditional definition of scholarship and research into four types:

1. **Discovery** includes original research that advances knowledge
2. **Integration** involves the synthesis of information across disciplines
3. **Application** of the discipline, including applied research and social innovation that goes beyond the campus
4. Systematic study and public sharing of **teaching and learning**

Guided by Boyer's model of scholarship and the four pillars of discovery, integration, application, and teaching and learning, Langara actively explores and pursues opportunities for scholarly activity and collaborative research.

ABOUT *IDEA*logue

The IDEAlogue shares and promotes news about scholarly projects and applied research happening in our Langara community. We aim to shine a spotlight on faculty, staff, and administrators here at the College who are reaching out and applying their knowledge and learning to the world beyond the classroom – whether it's through community partnerships, educational leave, or experimental research.

We also aim to connect Langara scholars with information about the potential funding available to them. If you're working on a project, please let us know by getting in touch at scholarlyactivity@langara.ca.

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