

John Marshall: demonstrating the potential of proteins in helping to predict human disease.

Dario Ruberto

The power of proteins

New area of inquiry generates Ryerson's latest spinoff company

By Lindsay Borthwick

Now that the genome revolution has rewritten the book on human life, biomedical researchers are turning their attention back to proteins – those chains of amino acids critical to the structure and function of living cells.

In the past five years, proteins have undergone this renaissance as scientists look for new ways to probe the natural world and, in particular, human disease. These are heady days for an old science that is new again thanks, in fact, to the sequencing of the human genome and to several enabling technologies that have changed the way researchers detect and study proteins.

Mass spectrometry is an exquisitely sensitive technique that uses lasers and electric fields to convert a complex mixture of solids or liquids, such as blood, into a gas and then separate its component parts by mass. Since each molecule has distinct characteristics, mass spectrometry for many decades was the outstanding analytical technique for detecting crime scene residues or the use of illicit or performance-enhancing drugs. One of the most significant advances in mass spectrometry was the development of new, more sensitive ways of finding peptides and proteins in a sample. The innovation resulted in a shared Nobel Prize in chemistry, awarded in 2002.

These developments permitted John Marshall, an Assistant Professor in Ryerson's Department of Chemistry and Biology, to join a new field of inquiry. He used the mass spectrometer to demonstrate the potential of proteins

to help foreshadow disease. Mass spectrometry enabled Dr. Marshall to analyse blood samples and determine how proteins behave under different conditions, such as health versus disease. Several papers and 12 patents have been issued in the last three years based on his initial work.

By determining which biomarkers in the proteins could predict specific diseases, it might be possible to diagnose illness years before symptoms appear. "Currently, diseases are not diagnosed with mass spectrometers or with proteins originally detected by mass spectrometers, so this is a whole other area of inquiry," says Dr. Marshall. "The potential benefits are astounding." However, many groups worldwide are working in this area and the ethical, regulatory and technical challenges are considerable.

American labs in the Pacific Northwest, at the National Institutes of Health outside of Washington, D.C., and Michigan State University are involved in important work to discover proteins in blood. They are using expensive, fixed and re-usable sample preparation systems in their work and the results are spectacular.

For the same reason a doctor cannot use the same needle on two patients, it is anticipated that regulatory agencies will not permit the same sample preparation device to be re-used between patients. Consequently, there is a need for simple, reproducible and disposable sample preparation systems. Dr. Marshall continues to look for ways to optimize the performance of mass spectrometers, understanding that

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You are what you wear

Studying the politics of clothing among women with disabilities

By Jennifer Fong

Ask any married woman what she cherishes most in her wardrobe and she will likely say her wedding gown. Although worn only once, that dress above all others is the most special.

Clothes reveal a lot about who we are, whether it's a tailored suit for the office or a pair of sweatpants for a Sunday afternoon at home. Kathryn Church of Ryerson's School of Disability Studies knows this well: her mother has sewn wedding dresses for women in her small Alberta community for over four decades. Exploring her mother's work led Dr. Church to think about the role clothing plays in contemporary social relations. With funding from the Social Sciences and Humanities Research Council of Canada (SSHRC), she launched "Into and Out of the Closet: Discovering the Lifeworlds of Disabled Women through their Clothing."

"[The concept] hit me like a ton of bricks," says Dr. Church. "Why am I thinking that clothing has nothing to do with disability? Every person with a disability has to get dressed in the morning like everybody else. The idea was that I could bring those two together in a way that had never been done before."

To gather data for her project, Dr. Church will interview approximately 100 women with disabilities over the

next three years to learn what their clothing says about their place in society. By exploring the women's closets and listening to their stories, Dr. Church hopes to gain insight into how women with disabilities present themselves to a world that may not welcome their different bodies. "[The idea] is deeply attached to real materials, real textures and the real fabrics of people's lives," she explains.

When it comes to clothing, the medium is the message.

In essence, when it comes to clothing, the medium is the message. Dr. Church first realized this when a Children's Aid Society worker told her that children with disabilities sometimes carry their clothes in garbage bags when moving between foster homes. "All of the clothing is hand-me-downs, second- or third-hand. They don't fit, they're not fashionable and they're not clothes that children would choose for themselves. [The situation] represents the social neglect that this particular group of kids experiences," she says.

In a similar vein, Dr. Church will analyse – through clothing – the lived experiences of the women she interviews. "What can this 'wardrobe moment' teach us about the social cir-

cumstances of women with disabilities, how their lives are organized [and] the social relations that shape their experience of being in the world?" she asks.

If funding permits, Dr. Church will reveal the results of her research in an "analytic fashion show."

"We want the data to be publicly accessible," she says. "Why should a study like this be written up in terms that are not understandable beyond

academia, and not accessible to people who are interested? We want [the research], in that sense, to be a piece of activism."

"Into and Out of the Closet" is not the first time Dr. Church has combined her interest in disability research with the arts. In 2003, she contributed to *Disability Arts and Culture: Review of the Literature*, a wide-ranging look at the print, film and performance work of artists, scholars and activists with disabilities. Sponsored by the Ontario Ministry of Citizenship and Immigration, the project led to her first research initiative at Ryerson, "Lights...Camera...Attitude! Introducing Disability Arts and Culture." This report and short DVD focused on different aspects of the

world of disability arts and provided a significant launch to Dr. Church's work at Ryerson. Before joining the University, her accomplishments included work on the National Film Board documentary, *Working Like Crazy*, and a national touring exhibit that honoured her mother's bridal dress creations and explored larger issues of gender and generations.

Today, Dr. Church is active in a number of research projects including "New Partnerships for New Times: Creating Learning Resources for Personal Support Workers in the Global Economy," sponsored by Human Resources and Social Development. This initiative aims to produce learning resources for students training to be personal support workers for people with disabilities. She also participates in the project "Doing Disability at the Bank: Discovering the Work of Informal Learning/Teaching Done by Disabled Bank Employees." Sponsored by SSHRC, the case study involves speaking with employees with disabilities in the financial sector about the kinds of informal learning they must do to be successful in a corporate environment.

"What I am attempting to do as a researcher is profile the expertise of people with disabilities from various walks of life about 'the way things

work' across a range of circumstances and environments in which they live and work," says Dr. Church. "Among other things, my goal is to contribute to a broader, more complex and less stereotypic view of disability."

Jennifer Fong is a student in Ryerson's School of Journalism.



Kathryn Church: delving into the closets and minds of women with disabilities.

Dario Ruberto



Forefront

by Dr. Judith Sandys

Associate Vice President, Academic
(Research and International Development)

Research enterprise has come of age

Reflecting on five years of success, and looking forward to the future of research at Ryerson

As my term as Associate Vice President, Academic approaches its end, I reflect on the developments over the past five years. These years have been exciting and fruitful. Our external research funding (nearing \$11 million in 2005) is twice as high as it was in 2000 and five times higher than a decade ago. But the size of the research enterprise is only part of the story. Our activities have grown in diversity as well as volume, with every Faculty at Ryerson now engaged in a research program. Increasingly, our researchers are involved in studies that ask important questions, often in innovative and unconventional ways.

This issue of *Impact* showcases the non-traditional, creative spirit of inquiry that characterizes Ryerson research: the exciting, new questions, perspectives, approaches, syntheses and collaborations that lead to new outcomes.

- John Marshall of the Department of Chemistry and Biology is using mass spectrometry as a tool to show the potential of proteins to predict diseases at the pre-emergent stage. His research has launched Ryerson's latest spinoff company.
- Kathryn Church of the School of Disability Studies is interviewing women with disabilities and studying their closets to gain insight into what their clothing says about their place in society.
- Marcello Papini of the Department of Mechanical and Industrial Engineering is exploring the use of directed particles to erode coatings, remove contaminants and mechanically etch materials. His research promises to have a broad range of application.
- Filiz Klassen of the School of Interior Design is exploring innovative fabrics that could be used in permanent or temporary architectural structures. She is contributing to the development of avant-garde building materials for spaces that will be more adaptable, environmentally friendly and responsive to our culture's needs.

• Aziz Guergachi of the School of Information Technology Management is studying complex systems found in business management, engineering and social science to help those who manage and use these systems make better decisions.

• Myer Siemiatycki of the Department of Politics and Public Administration aims to deepen understanding of how immigration shapes our national identity. He is co-editing the first national study on immigrant involvement in Canada's electoral process.

It has been extremely rewarding to oversee Ryerson's richly textured research endeavour and to witness its gathering momentum across all disciplines. In the past five years, I have seen the reputations of established researchers grow, new faculty members launch programs of outstanding promise and a groundswell of interest among faculty in disciplines that are not traditionally research-oriented.

While research at Ryerson is, of course, dependent on the creativity and hard work of individual researchers, it is also enhanced by the presence of a supportive environment. Many people across the University have contributed to creating such an environment. Of particular note is the staff of the Office of Research Services who, under the direction of Bob Dirstein, go to incredible lengths to provide support to Ryerson researchers. It has been a privilege to work with all of them.

This year the University will appoint its first Vice President, Research and Innovation, signalling that, while our research enterprise is still young, it has come of age. I know that the future will see our reputation for innovation growing ever stronger as we continue to pursue our unique paths of discovery.

Controlled chaos

Microscopic particles are making a big impact in engineering



Marcello Papini: new uses for particle erosion.

Dario Ruberto

By Gina Vaccaro

Particle by particle, something is eating away at Marcello Papini's research, and he wouldn't have it any other way. The Associate Professor in Ryerson's Department of Mechanical and Industrial Engineering is studying the use of directed particles to erode coatings, remove contaminants and mechanically etch materials. Although this field may seem clear-cut, a closer look reveals a fascinating realm of research with a broad range of application.

"Particle erosion can be used for anything from mechanically etching glass to blast cleaning industrial equipment and paint stripping aircraft and automobiles," explains Dr. Papini. The process is also particularly suited to Micro Electro Mechanical Systems (MEMS) applications, a new area of engineering in which mechanical elements, such as sensors and electronics, are integrated on a silicon or glass surface. Dr. Papini believes particle erosion may be the best way to create the microscopic channels and etchings required to imbed those mechanical elements.

To achieve solid particle erosion, a stream of particles is directed at an object with enough force to strip away, erode or clean a surface, similar to the process of sandblasting. In abrasive jet micromachining (AJM) — a form of solid particle erosion — a surface is covered with a non-erosive mask, leaving exposed areas for etching. The time in which the object is subjected to the jet determines the depth of etching. Although the principle behind this research is simple, developing the technology is exceedingly complex.

To the naked eye, AJM involves simply directing a jet of air at a target. But under a microscope, a tiny universe of controlled chaos can be seen. Particles of various sizes and shapes are emitted toward a target. The particles collide with the surface and tear away matter before rebounding in every direction and crashing into incoming particles. This is where the process gets complicated. The trajectory of every particle, whether spherical or angular, must be

computer-modelled and predicted to determine the shape and depth of the erosion-crater profile. This modelling process must consider jet stream and rebound collisions, the type of jet nozzle and its distance from the surface, and the type of particle and target materials being used.

Dr. Papini's research is funded by the Natural Sciences and Engineering Research Council of Canada (NSERC), and the Ontario Centres of Excellence — Centre for Materials and Manufacturing. His work is based on computer models and theories of fundamental erosion developed by his research group. This model was created over the past four years to generate 3-D simulations of erosive processes. Already, the model has been used to predict the initial erosion profile of a flat surface.

These simulations will help Dr. Papini and his research team identify and model the factors that contribute to the roughness of a machined surface and its uniformity over flat areas and inclined sidewalls. Among other things, Dr. Papini hopes his model can be used to achieve desired erosion shapes, accurate erosion rate predictions, precise AJM operations and more efficient blast cleaning.

Currently, most companies rely on chemicals to remove coatings and etch microscopic features onto glass and silicon plates. "Material removal and etching using chemicals can be messy. Many of the products are harmful to the environment and disposing of them is costly," says Dr. Papini. Additionally, it is difficult to chemically etch micro-features to different depths. "We hope this research will offer a cheaper, faster and more environmentally friendly alternative."

Dr. Papini is also supported by the NSERC/Canadian Institutes of Health Research (CIHR) - Collaborative Health Research Projects (CHRP) program.

Gina Vaccaro is an alumna of Ryerson's School of Journalism.

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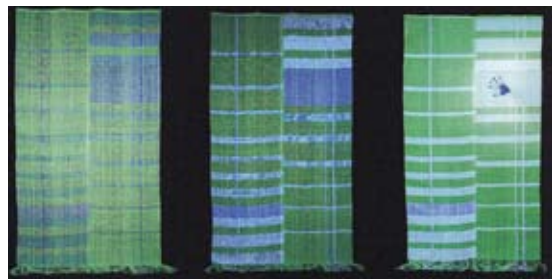
Mobile homes

Futuristic fabrics could change how – and where – we see housing

By Jennifer Fong

Imagine a room that changes colour with the temperature. When it's warm, the walls glow vibrant red and when it's cool, crimson fades to icy blue. The walls also maintain an imprint of those who occupy the room.

Although it sounds like the work of a science fiction writer, this idea is actually being explored by Filiz Klassen of Ryerson's School of Interior Design. By investigating innovative and lightweight fabrics,



Light-sensitive screens provide privacy in transportable dwellings. Photo credit: Kennedy & Violich Architecture.

she aims to prove these materials can provide the world with new ways of inhabiting space. These alternative fabrics could be used in permanent or temporary architectural structures, and would meet the needs of our on-

the-go culture, which demands that spaces be more adaptable, environmentally friendly and responsive to our needs.

Prof. Klassen hopes to realize those possibilities through her research project, "Malleable Matter: Material Innovations in Architecture," a three-year initiative sponsored by the Social Sciences and Humanities Research Council of Canada's Creation Grant in Fine Arts.

Prof. Klassen is producing a life-sized architectural structure made of fabrics blended with glass, metal, carbon and ceramics. When the project is complete, the material prototypes and resulting spaces will be showcased in a catalogue and exhibition.

Flexibility is a key element in Prof. Klassen's experiments with new materials. At the moment, she explains, our built environment is fixed. But if we found building and material options that made the assembly of habitable structures quick, easy and adaptable,

Prof. Klassen believes our lives would no longer be defined by hard, permanent spaces.

To find that kind of adaptability, she is investigating how innovative fabrics could become the building materials of the future. "I think as human beings we absolutely deserve the best spaces we can inhabit."

While other researchers have developed new materials for fashion and jewelry, Prof. Klassen is unique in her focus on transformable and portable architecture that responds to people's needs. As an extension of that expertise, she co-edited, with architect Robert Kronenburg of the University of Liverpool, a collection of papers from the 2004 International Conference of Portable Architecture. The event, which Prof. Klassen co-chaired with Prof. Kronenburg, was held at Ryerson and was the third in a series of conferences on portable architecture, buildings, landscape and design. The book, *Transportable Environments 3*, explores the wide range of uses for transportable structures, their various forms and future development issues.

Jennifer Fong is a student in Ryerson's School of Journalism.

Filiz Klassen: pushing the possibilities of portable architecture.



Dario Ruberto

'As human beings we deserve the best spaces we can inhabit.'

A life less complicated

Improving decision-making in complex systems

By Andy Lee

Aziz Guergachi wants to make the world a simpler place.

The Professor at Ryerson's School of Information Technology Management (ITM) is studying complex systems to help those who manage and use them make better decisions.

"Given a [complex] system, we can look at the uncertainty that underlies its behaviour and try to characterize it to help operators make the right decisions," says Dr. Guergachi.

For research purposes, he defines a complex system as:

- *Stochastic* – the variables within the system behave in a random manner.
- *Non-linear* – changes in causal variables do not result in proportional changes in effect variables.
- *Dynamic* – the system evolves over time.

The stock market is an example of a complex system. Stock prices are influenced by a multitude of factors, including company profits, dividends, business investment, speculation, and supply and demand. Due to the

market's stochastic, non-linear and dynamic nature, it is difficult to accurately predict its value.

Currently, the behaviour of complex systems is not completely understood. Although many modeling technologies exist – neural networks, fuzzy logic, chaos analysis and catastrophe theory, among others – they all have limitations. Dr. Guergachi hopes to integrate these technologies into a universal model that can explain the behaviour of all complex systems.

With a PhD in engineering and bachelor's degrees in systems engi-

neering and pure mathematics, Dr. Guergachi's interdisciplinary research focuses on three diverse systems found in business management, engineering and social science.

The first system involves the \$30-billion US trade promotion industry in the manufacturing and retail sectors. This includes direct mail advertising campaigns, which are often characterized by capricious decisions and inefficient processes. A better understanding of trade promotion systems would improve return on investment and competitiveness for organizations that use them.

The second system focuses on the biological treatment of wastewater. While wastewater treatment plants are cost-effective, they lack accurate control measures. Studies have found that up to 87 per cent of plants regularly violate government treatment standards. An accurate model would enable plant managers to meet operating standards, improve their bottom

"Being able to model human emotions will have applications in many different areas," says Dr. Guergachi. "Emotions definitely play a role in the decision-making process." Business decisions, for example, are often influenced by human emotions.

Nonetheless, Dr. Guergachi considers humans to be an essential element in the operation of complex systems. "The machine can only help you to a certain extent," he says. "You need to use both machine-based algorithms and human judgment." The latter provides valuable insight that mechanized processes cannot.

Furthermore, Dr. Guergachi maintains that computers will never perform human functions, such as innovation and creative design. "There is no way to discard the human dimension in managing complex systems," he says. "There will always be a need for human interaction."

By analysing the three diverse systems outlined above, Dr. Guergachi

Computers will never perform human functions, such as innovation and creative design. "There will always be a need for human interaction," says Dr. Guergachi.

line, protect the environment and preserve the health of the community.

The third and final system concerns developing models to express human emotions. One application, developed by Dr. Guergachi and fellow Ryerson ITM researchers, involves translating the emotional content of movies into signals that can be interpreted by people with visual or hearing impairments.

Emotion modeling would not only benefit people with disabilities, but also decision makers in general.

hopes to discover their hidden commonalities and, ultimately, a universal model for all complex systems. While his goal is ambitious, Dr. Guergachi remains realistic. "I'm not happy with the status quo," he says. "If I can make a substantial contribution by the time I retire, I will be happy."

External funding for Dr. Guergachi's research is provided by the Natural Sciences and Engineering Research Council of Canada, the Canada Foundation for Innovation, the Ontario Innovation Trust and NPD Group.

Aziz Guergachi: simplifying complex systems.



Dario Ruberto

The power of proteins *continued from page 1*

perfecting this methodology is an essential part of every discovery in the biomarker field.

After three years at Ryerson, Dr. Marshall is grateful to be working in this important field: he is practising a new and promising kind of science and his expertise has attracted leading industry partners such as Bruker Daltonics Inc., MDS Sciex and Agilent. In turn, these partners have loaned rare and valuable equipment to Ryerson's state-of-the-art analytical chemistry lab. "[Ryerson] is blessed with some of the best industrial partners and equipment you can get, and we're collaborating with some of the best engineers, scientists and clinicians in town," says Dr. Marshall.

As well, further investment by the Badeau and Wolfond families of Toronto enabled Dr. Marshall to launch YYZ Pharmatech Inc. — one of Ryerson's first spinoff companies and a milestone in the development of the University's research profile.

Ryerson is exploring new ways to encourage and promote commercially relevant and collaborative research at the University. "This is an arrangement that we hope will increase opportunities for Dr. Marshall," says Heather Gallant, Ryerson's Industry Liaison Manager. The unusual model provides funding flexibility for the lab, and allows Dr. Marshall to be responsive to needs and trends from industry. "Now that the framework is in place, Dr. Marshall and his team can do the real work and innovate."

"The physicists, mathematicians and chemists who invented and worked toward perfecting mass spectrometers have done their part extremely well. Now protein biochemists must do their part to tailor samples to the new instruments," explains Dr. Marshall. "How the machine works — whether it works well or works poorly — really depends on the quality of the

sample you introduce." He compares the preparation of protein samples to cooking: "Essentially, you've got a lot of ingredients in your pantry and you need to find the best way to mix them together and stir it up for each job. We make recipes for preparing proteins for mass spectrometry."

Given the number and variety of proteins in the human body, the recipes are practically endless. It is this diversity and complexity that attracted Dr. Marshall to the protein world at a time when the Holy Grail in biomedical science was identifying the thousands of genes in human DNA.

"I find DNA is more predictable to work with. There's only one basic set of recipes required," says Dr. Marshall, whose PhD at the University of Waterloo and post-doctoral work at the University of Toronto, Toronto General Hospital and the Hospital for Sick Children were in protein biochemistry. On the other hand, "it seems like each protein sample needs its own cookbook. It's a much more puzzling thing."

It is this willingness to literally write the recipes for success with biomarkers, along with his skills in modern instrumentation that attracted Dr. Marshall's collaborators. "Dr. Marshall understands the analytical subtleties in biological context, which makes him a worthwhile partner," says Ryerson alumnus Mike McDonell, a Technology Specialist at Bruker Daltonics Inc. "Many talented protein biochemists are unfamiliar with the ion physics of mass spectrometers. There are very few who understand what it really takes to do trace level analysis in complex biological fluids. That is a rare combination of skills."

Indeed, researchers in this developing field have often over-promised and under-delivered as they grappled with the tenets of advanced analytical techniques. After all, it has been just

a few years since these new protein tools have evolved "from being in a few small laboratories with sort of an academic, capricious interest to verging on becoming a mainstream workhorse," says Dr. Marshall. Toronto is an epicentre for those studying genetic science as well as protein research, with internationally recognized researchers working at many institutions in the city.

The realization that two prominent cancer biomarkers — PSA for prostate cancer and CA-125 for ovarian and other types of cancer — have not com-



'[Ryerson] is blessed with some of the best industrial partners and equipment, and we're collaborating with some of the best engineers, scientists and clinicians.'

pletely lived up to their initial promise underlies the need for groups of more effective biomarkers. Dr. Marshall and his collaborators are proceeding cautiously to safeguard the quality of their research and realize the commercial potential of their expertise for their industrial partners. "We hope that by partnering with Dr. Marshall we will be able to make available some of the methodology he has painstakingly developed. This will allow its widespread use by scientists who are new to this field of analysis," says Chris Lock, a Senior Scientist at MDS Sciex who collaborates with scientists at the forefront of analytical chemistry, both in Canada and internationally.

Dr. Marshall believes that disposable aids for protein preparation are ready to be applied to the diagnosis of disease. His patent for protein biomarkers of heart attacks has been accepted, and he expects to help study blood samples for cancer biomarkers in the coming years.

Dr. Marshall gratefully acknowledges Ryerson's significant support for biomedical research. The University has built new laboratories, renovated a tissue culture facility and provided the infrastructure for mass spectrometry and laser confocal microscopy, which

knowledge, expertise and methodology that Dr. Marshall has developed and try to apply it," says Mr. McDonell.

As he turns this corner in his research career, Dr. Marshall attributes much of his success to the supportive network of scientific colleagues and administrators at Ryerson, as well as the exceptional facilities on campus. "It's the perfect time for young investigators to come to Ryerson because the University is just starting down this road. If you come here, you are not going to have a big lineup of people to stand behind, waiting until they have their vision realized before you get a shot at yours."

He welcomes the challenges of working at a university that is still building its research team and infrastructure. The challenges and rewards, he says, extend beyond conducting experiments and making discoveries. "In this case, the goal is even more exciting, because the challenge is to build your institution. We are humbly honoured to be permitted to do our small part to work with the established biomedical research institutes in Toronto. These are serious, life or death issues. At Ryerson, we understand our duty and obligation in return for this privilege, and we aim to show that our institution can also make a fundamental contribution for the benefit of all Canadians."

Additional funding for Dr. Marshall's research is provided by the Canada Foundation for Innovation, the Heart and Stroke Foundation of Ontario, the Ontario Ministry of Research and Innovation, the Natural Sciences and Engineering Research Council of Canada, and YYZ Pharmatech Inc.

Lindsay Borthwick is an alumna of Ryerson's School of Journalism.

Immigration nation | The changing face of Canada



Myer Siemiatycki: exploring how immigration shapes national identity.

Dario Ruberto

By Andy Lee with files from Melissa Whetstone

Who are we? For Canadians, national identity is an elusive concept at best. While other nationalities have a clear understanding of how the world views them, Canadians often find it difficult to define what makes us distinct.

Myer Siemiatycki of Ryerson's Politics and Public Administration Department believes he has the answer: immigration. It's the experience — past or present — that's common to all Canadians.

"It's hard to find an aspect of Canadian life that doesn't reflect immigration," says Dr. Siemiatycki. "It's seen in our literature, our school systems and our government policies. Our political, cultural and social lives are significantly defined by immigration."

Dr. Siemiatycki is the Director of Ryerson's Immigration and Settlement Studies graduate program, the first of its kind in Canada devoted to the study of immigration policy, services and experiences. Launched in 2004, the program explores Canadian immigration trends, policies and programs

from a multi-disciplinary perspective and reinforces the growing importance of immigration to this country.

Currently, Dr. Siemiatycki is co-editing the first national study on immigrant involvement in Canada's electoral process. The project examines the accessibility of Canadian

'Everyone is connected through an immigration experience.'

institutions and the representation of minority groups at all three levels of government. Dr. Siemiatycki believes understanding immigration is central to the study of Canadian politics and our national identity. "Whether you, your parent, grandparent or earlier ancestors made the move to this country, everyone is connected through an immigration experience," says Dr. Siemiatycki.

He is conducting most of his research in Toronto — one of the world's largest immigrant destination cities — with funding from the Social Sciences and Humanities Research Council of Canada, the Geomatics for Informed Decisions Networks of Centres of Excellence and the Joint Centre of Excellence for Research on Immigration and Settlement. "Toronto is a rich setting to study the full palette of issues related to immigration."

Dr. Siemiatycki is particularly interested in the evolving relationship between immigrants and their new home, and what it means to be an immigrant today. "It does not mean closing ties to the homeland, but rather an interconnectedness between

the new world and the old," he says. "[Immigrants] are reshaping and redefining our country and our world."

This influence dates back to the 1960s, when Canada "opened its doors to the world." During that time, Canada saw a sharp increase in its Asian, African and Middle Eastern

populations. "The transformative impact on Canada was extraordinary — it became a global population."

Dr. Siemiatycki is not suggesting Canada is perfect. He does, however, believe that the country's progressive immigration policy has made the nation more dynamic, and a role model for cultural integration.

Dr. Siemiatycki's work has explored the struggles of minority religions to gain acceptance in the Canadian urban landscape, and the "contours of transnationalism" — the ties recent immigrants from Hong Kong have with their birthplace and Canada.

His current projects include co-editing a book on minority representation among elected politicians in Canada's largest cities, and a study with colleagues at Ryerson and York University on the location of immigrant services and where newcomers choose to live.

Through his research, Dr. Siemiatycki is exploring the making of a more inclusive Canada.

Melissa Whetstone is an alumna of Ryerson's School of Journalism.

impact

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