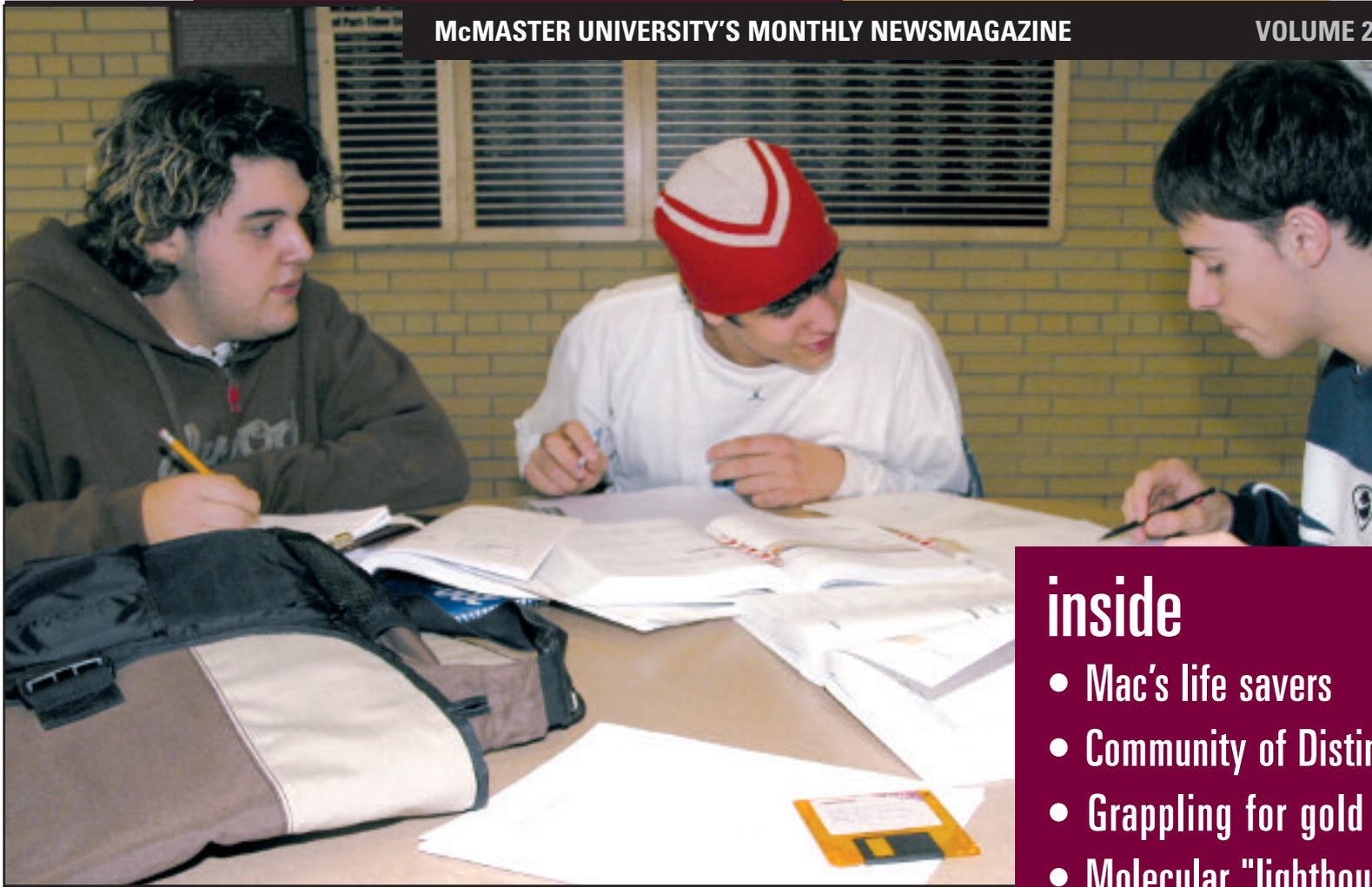


McMaster Review

McMASTER UNIVERSITY'S MONTHLY NEWSMAGAZINE

VOLUME 2, NUMBER 10



First-year students (left to right) Casey Siena, Jordan Fortino and Greg Mallia hunker down for their calculus exam.

1 December 2003

inside

- Mac's life savers
- Community of Distinction
- Grappling for gold
- Molecular "lighthouses"
- Learning the lingo

Surviving the exam crunch

BY JOHN BUGAILISKIS

McMaster
University



Like highly toned athletes on the eve of the big event, McMaster students are trading in their Nikes for notebooks as they prepare for final exams.

For some, the thought that months of classes and study may boil down to how they perform during three hours in an examination room can be a source of great stress.

The key to success on exam day will largely be determined by how well students have prepared themselves in the weeks leading up to the finals.

"University is not that much harder than high school, but there are higher expectations and a large increase in the volume of material and the speed at which it's covered," explains Peter Walsh, academic skills counsellor in the Centre for Student Development. "Once you get behind, it can be difficult to catch up."

Students who believe misery loves company may

want to check out the All Night Study Program (ANSP). The service, organized by the McMaster Students Union with some generous assistance from various departments on campus, allows for 24-hour access to the McMaster University Student Centre (MUSC).

During the exam period from December 1-16, all floors will be accessible to students, along with the meeting rooms and the banquet hall; the first and second floors are "discussion" floors and the third floor will be for "silent study." Four monitors will be on staff each night to ensure the space remains safe and quiet. There's room for as many as 2,000 students, and coffee, tea, hot chocolate and some snacks will be available during the wee hours of the morning.

You can find more details on ANSP at www.msu.mcmaster.ca/stulife

For more studying tips see page 4

Vital signs of McMaster's Emergency First Response team

— CHANTALL VAN RAAY



Emergency First Response Team members, from left, Sandy Glover, Morgan Hillier and Stephanie Lau, perform a mock call on EFRT team member Brenna Ammons in the McMaster University Student Centre atrium during EFRT's public relations week Nov. 10 to 14.

It's 4:30 a.m. and all is calm in the Emergency First Response Team (EFRT) office. With the occasional yawn, the on-call emergency responders rub their eyes in an effort to stay awake. They pass the time doing homework, playing cards or just talking about life. When they're tired, they steal to EFRT's bedroom for a nap.

Then, without warning, the dispatch sounds and the team is called to an emergency on campus. They have two minutes to get there.

The atmosphere undergoes a quick transformation. Immediately, the three-member team begins to prepare. They put on their fully-equipped backpacks and grab their bikes, switching into emergency medical mode they prepare for the unexpected. It could be as simple as a slip and fall; it could be as deadly as a cardiac arrest.

"It's really a nerve-racking experience to hear the tone go off in the middle of the night," admits Brenna Ammons, first-year EFRT member and bachelor of health sciences student. "You have to calm down, relax and listen to the dispatch carefully so you know where to go."

When they arrive on scene, they immediately assess the situation. They've learned every call is unique.

McMaster's EFRT responds to a variety of calls on campus, from musculoskeletal injuries, such as sprained ankles and twisted knees to seizures, heart attacks, cardiac arrests and diabetic emergencies. They also are called to alcohol and drug-related injuries and anxiety attacks, experienced occasionally by students during exams. Last year, members responded to 385 calls, with two-thirds occurring at night. They called the ambulance 60 times and administered oxygen 26 times.

Team member Krista Adlington feels the EFRT is vitally important. "Without the EFRT, there would be a 10 to 12-minute ambulance response time, which could mean life or death to people who are having anaphylactic shock," says the public relations coordinator and fourth-year biochemistry student. "It can mean life or death for someone going into cardiac arrest. It's four minutes before your brain starts to die from lack of oxygen and if the ambulance doesn't get there within 10 minutes, it's a pretty unfortunate situation that you're left in."

Not just anyone can become a first responder. The selection process is intense. Prerequisites to apply include standard first aid and CPR certification. Typically, about 80 people apply and are interviewed. Of these, 40 are chosen for two full weekends where applicants are tested on their ability to perform the skills required to be a first responder. From this, 10 to 15 people are selected to join the team.

These stories are excerpted from the McMaster Daily News web site.

For additional details or to read other McMaster news, visit <http://dailynews.mcmaster.ca>

New team members must then receive certification in oxygen administration. There are additional qualifications they can acquire, such as the automated external defibrillator administration and Epi Pen certification.

Each month, team members receive updated training, organized by EFRT's training co-ordinator Morgan Hillier. The group also is trained on how to administer first aid/CPR courses, which they hold regularly throughout the year.

Team members must also be quick and strong. "You have to be fast and you have to be strong to carry this pack around," says Adlington. Items in the pack include an oxygen tank, an automatic external defibrillator, a blood pressure cuff, stethoscope, Epi pens, for allergic reactions and glucose for diabetic emergencies.

While team members are trained to react to every type of call, it can sometimes be overwhelming. For Adlington that once meant responding to a suicide attempt. "That was one of the most emotional and distressing responses for me," she says. "Our medical response is our primary response but there are always going to be other factors. You have to make sure you are prepared for anything. Not only are team members skilled at what they do, they have their heads about them to remain calm and cool under pressure and think clearly enough to improvise and deal with the situation in whatever form it takes."

To help them do this, members debrief after each call. "It doesn't matter how severe it is, you go through debriefing," says Trevor North, program director and fourth-year nursing student. "Executives come in and help with the debriefing and depending on the severity of the call, sometimes an outside counselor will come in to assist. At the time it may not seem serious but it can have an impact later on."

North feels that by belonging to the EFRT team, students learn more than medical skills, they acquire effective communication skills, they learn how to deal with stressful situations and for some, they get a concrete understanding of what they've learned in the classroom. Typically, he says, team members are interested in getting into medical school, or a health-related field, or going to teacher's college or getting their master's or PhD.

When EFRT was established in 1982/83 it was the first program of its kind in Ontario. Eddie Wasser, medical director of EFRT, launched the program when he was a student at McMaster. Now the first response team phenomenon has spread across Ontario and is located at most universities. At McMaster, it is located in Rm. 103 of the MUSC, and includes a bedroom for people to sleep in if needed.

The McMaster Students Union service operates 24 hours a day, seven days a week. Currently, there are 30 students on the team, working five to six shifts a month. The shifts are divided into an eight-hour day shift and 16-hour night shift. Three responders are on-call for each shift, as well as an executive member who has a radio to listen in if there are any problems or if team members need equipment.

If someone has an emergency, they can dial 88, which goes immediately to security and they dispatch the EFRT to wherever the situation is occurring. For more information visit www.msu.mcmaster.ca/efrt/.

Campus Eye continues on page 6

Volume 2, Number 9 • December 1, 2003

Published by:
Office of Public Relations
Room 111, Chester New Hall
McMaster University
1280 Main St. W.
Hamilton, Ontario L8S 4L9

Fax: 905-521-1504
E-mail: review@mcmaster.ca

The **Review** is published monthly (except July) for faculty, staff and students at McMaster University.

The editor reserves the right to limit, select, edit and position submitted copy and advertisements. Views expressed in the **Review** do not necessarily reflect University policy.

Comments and letters should be sent to:
Editor, 905-525-9140, ext. 23662;
e-mail: bugaili@mcmaster.ca.
Letters to the editor must include name, department or address and phone number.

Vice-President, University Advancement:
Roger Trull
Acting Director, Public Relations:
Jayne Johnston
Editor: John Bugailiskis
Design and Production: Kristy Paone
Contributors: Chantall Van Raay, Lisa Caines, Danelle D'Alvise
Photography: Chantall Van Raay
Advertising: Pat Miladin

Deadlines: All art and ads are due on the first Friday of every month in the month preceding publication.

McMaster University and its employees and agents assume no responsibility for damage, errors or omissions related to this published material or for dissatisfaction with goods or services advertised herein.

Grappling for gold

Chancellor's Gold Medal honours dean's list athlete

BY LISA CAINES

Lulu Bursztyn – a dean's list chemical engineering student, playing varsity and intramural sports, and serving in student leadership positions – never backs down from a challenge.

Her decision to pursue chemical engineering was driven by a desire to integrate one of the most academically challenging programs on campus with becoming part of the dynamic social culture that's long been associated with engineering students at universities across the country.

"Usually when you hear about engineers at University it's because they're the ones who are 'doing things,'" she says. "It's a really fun experience and I wanted to be part of that."

Bursztyn's propensity for 'doing things' earned her the Chancellor's Gold Medal at November's convocation ceremony, which is awarded to an undergraduate student in his or her final year of study who ranks highest in scholarship, leadership, and influence. She's spent her four years at McMaster exhibiting those qualities, through her extensive involvement in academics and extra-curricular activities. And in her final and most demanding year of her undergraduate career, Bursztyn shows no sign of slowing down.

Scholarship, she admits, comes easily for her and her older sister. Born in Zimbabwe – Lulu means "pearl" in Swahili – and raised in England before settling in Barrie, her parents (who both have PhDs) have always instilled the importance of education.

"Growing up, my parents put a lot of focus on education, teaching me to read when I was two," says the 21-year-old Bursztyn. "I've always enjoyed school, and getting my PhD has never been a question, it's just something you do."

But Bursztyn's involvement in the faculty of engineering goes far beyond stellar academic performance. She's also a member of the McMaster Engineering Society, and the Chemical Engineering Club. She's helped to organize a 450-delegate five-day chemical engineering conference, coordinated the selling of McMaster Engineering merchandise, and worked on a one-year internship at Dofasco. For the past three years she's served as a "redsuit," one of several senior students



Lulu Bursztyn

who sport red jumpsuits during Welcome Week and act as a resource for first-year engineering students throughout the school year.

"Sometimes engineering students will ask me to explain things they don't understand from their text books," she says. "I think a lot of people know me because I'm more visible to them, being involved in so much. I really enjoy being involved in sports because I get to meet students from other faculties as well as engineers."

A member of McMaster's varsity women's wrestling team, Bursztyn attends tournaments at other universities every other weekend throughout the school year. Wrestling has the longest varsity seasons, running from September until after final exams in April. She admits some people are intimidated by her unique choice of sport, but she claims it's an excellent way to stay fit, and more interesting than going to the gym.

"Wrestlers are a very fun, unique breed of people," she says. "It's a vigorous, dynamic sport and no match is ever like another. That's important when you're wrestling six days a week – you don't want to get bored."

She also plays intramural soccer, water polo and basketball.

Being an athlete in a sport that's been popularized by the antics of television personalities, and a woman in a field that's traditionally been dominated by males could be intimidating for some, but it doesn't feel strange to Bursztyn at all.

"The male-female ratios are improving in engineering classes and they're especially balanced in chemical engineering. Classes are always a positive experience, and a really great dynamic," she says. "And most people think wrestling is cool – even though many don't quite realize it's not the same as what's on TV."

Bursztyn says being a varsity athlete and an engineering student isn't for everyone, but she highly recommends the experience to students who can handle the juggling.

"To make it work you have to get eight hours of sleep a night, go to every class, take good notes, and pay attention," she says. "Being so busy has forced me to develop great time management skills, and that's very a valuable skill at all stages of life."

"THE MALE-FEMALE RATIOS ARE IMPROVING IN ENGINEERING CLASSES AND THEY'RE ESPECIALLY BALANCED IN CHEMICAL ENGINEERING. CLASSES ARE ALWAYS A POSITIVE EXPERIENCE, AND A REALLY GREAT DYNAMIC," SHE SAYS. "AND MOST PEOPLE THINK WRESTLING IS COOL – EVEN THOUGH MANY DON'T QUITE REALIZE IT'S NOT THE SAME AS WHAT'S ON TV."

The 3 Rs of studying: remember, recite and rest

The immediate goal of studying is to help you remember. You are probably never more aware of this than when you're confronted with an examination. As is the case with most skills, your success on tests is greatly affected by your study technique. Consistent success in taking exams is possible once you understand that your ability to recall information is largely determined by the way you study the material in the first place.

Research clearly shows that learning takes place most effectively when information is processed in small chunks spread out overtime. So, if you want to remember what you study, review ideas a few at a time, many times. The way to get a head start on effective learning is to complete all assignments, including reading, before class. Then attend all classes and take thorough notes. This should be followed by reviewing and editing your notes as soon after class as possible. This process alone will ensure that a significant amount of learning takes place prior to becoming involved in what most students think as actual "study." If you have prepared yourself in this manner, studying for an examination should be largely a matter of systematic review. For most courses, this will involve some silent review, where you alternately read the information you want to learn and then quiz yourself until you can recall it without referring back to your notes.

Effective learning involves more than simple recall, however. It includes developing a sound understanding and the ability to use the ideas you are learning. One easy way to improve upon silent review is to increase the number of senses involved in the learning process. Recitation, or repeating information aloud, increases recall through stimulating the hearing sense as well as the visual sense. Transforming ideas into diagrams or maps is another way to increase sensory input. In addition to the extra thought involved in developing a diagram, recall of that information will often be increased simply because of the newly created visual structure.

Many students also find that the motor activity involved in the act of writing out information they wish to learn helps them to remember it better. A technique that often accompanies silent review or recitation is the use of cues. A cue is usually a word, phrase, or question selected because of its ability to trigger the recall of specific information you want to learn. Cues can be incorporated into your notes by placing them in the left-hand margin beside the ideas or information they summarize. You can then

study the material by covering your notes and using the cues to help you recall as much as you can.

A good variation of this technique is to write the summary word or phrase on one side of a 3x5 card and place the information you want to recall on the other side. Study cards offer two important advantages. First, the work involved in making the cards helps you begin to learn. Second, study cards allow you to physically separate and focus on one piece at a time, which can be important for some learners.

There are two techniques which can be of aid when you must learn long lists of information. The first is called chunking and refers to breaking the list up into related groups of information. To chunk effectively, make sure that each group contains only those items which have something in common. When you cannot chunk information or you need to recall a list in a specific order, you might want to use a word or sentence mnemonic. A memorable word can often be created by using first letters of the terms you have to know.

In courses where you can expect computations on the exam, it is important that you prepare through practice. You can do this by reworking any homework problems that you missed, by working additional problems that were not originally assigned, or by working problems on old exams. Tests involving computations usually adhere to a strict time limit, so you should emphasize speed as well as accuracy when you practice.

An often overlooked source of aid in preparing for exams are the clues provided by your instructors. Instructors are frequently more helpful in pointing out what will be emphasized than they are given credit for. If you are serious about your studies, you should always be willing to take the initiative to find out as much as possible about the exam. At worst, your instructor will only decline to answer some of your questions. Chances are, however, that you'll receive useful advice.

Finally, should you cram for an exam? You should do so only as a last resort, remembering that if you need to cram it is too late to learn everything! Instead, be selective. Cramming leaves little time to process ideas in depth so focus mainly on basic concepts, terminology, or lists that can be memorized. And, because time is very short, study first those ideas which you strongly expect to be covered on the exam. In addition, having a good night's sleep and proper food is an advantage in the recall of information. (Adapted from Penn State University)



Stress busting tips

Believe in yourself

Worrying excessively won't help. If you have taken the time prepare for the exams, you should do fine

Don't try to be perfect

Keep things in balance. Aim to do your best, but be reasonable about the demands you place upon yourself.

Take steps to overcome problems

If you don't understand some of your course material - take action. See your Prof, TA or get help from your classmates.

Don't keep things bottled up

Confiding in someone you trust and who will be supportive is a great way of alleviating stress and worry.

Keep things in perspective

In the grander scheme of your whole life, exams are only a small part.

Remember that you are not alone: almost everyone gets somewhat anxious at exam time.

To reduce your stress try to stay on a reasonably regular schedule of reviewing, eating, sleeping and relaxing. Don't try to study 24 hours a day; your efficiency and capacity to retain material will rapidly decrease. Allow time for fun and relaxation to avoid burning out. Exercise will boost your energy, clear your mind and reduce stress.

Adapted from the Harvard Law School Health Service Handout.

Gallery celebrates faculty's roots and founders

BY LISA CAINES

Radical ideas and a revolutionary approach are at the root of McMaster's Faculty of Medicine, but in 1965 when it was still taking shape, the idea of churning out doctors who were learning without a carefully-regulated curriculum was still a gamble.

Dr. John Evans, the Faculty of Health Sciences' founding dean, says he and his colleagues were too busy trying to make their concept of problem-based, self-directed learning work to consider how far it would go. Now, the learning style they pioneered has influenced health care education worldwide, and become the hallmark of McMaster's integrated Faculty of Health Sciences, benefiting the school of nursing, rehabilitation sciences, midwifery program, and the newest Bachelor of Health Sciences program all endorse the learning style.

"I'm sure we didn't realize at the time the significance of what we were doing," says Evans, now chairman of Torstar. "It was an enormous amount of trust that [former McMaster president] Harry Thode put in a young group of renegades, and I suppose we may have caused him some great difficulties. Now those people have all become towering figures in their areas of expertise."

Evans is among the nine Faculty of Health Sciences leaders from various programs being recognized for outstanding leadership and distinguished contributions through innovative scholarship and research with their inductions into the Faculty's Community of Distinction. Portraits and biographies of the nine inaugural members will be permanently displayed on a 120-foot second floor gallery in McMaster's Health Sciences Centre.

The election committee – consisting of the Faculty's dean and representatives of its staff and alumni – will select up to five individuals annually for induction. Those eligible include alumni, students and anyone who is, or has been, faculty or staff of the Faculty.

"We're a relatively young Faculty, but we have a remarkable history of excellence and innovation," said Dr. John Kelton, dean and vice-president of the Faculty. "It's important we recognize the individuals who have put us on the map."

McMaster's problem-based learning model was developed in response to a set of situations that was arising around the world. Doctors were quickly realizing that one year after their final exams, medical students were retaining only about 30 per cent of the information they had learned the year before.



(Left to right) McMaster's president Peter George, Dr. John Evans (inductee), and Dr. John Kelton celebrate the unveiling of the Health Sciences' Community of Distinction.

With problem-based learning, Evans and his colleagues introduced a new way to learn, ensuring the curriculum was based on actual cases, where small groups of students were introduced to a problem and then encouraged to work through it to find a suitable solution.

"Students were seeing clinical problems such as gangrene, and they worked through them and learned how to approach problems as they arose," he says.

But with innovation comes doubt, and Evans says in the early days the team was busy trying to recruit faculty who would endorse the idea. He says they were particularly indebted to the Hamilton-area, which brought forth some family physicians who knew that they were putting their reputations on the line, and taking time away from full-time practices. And even the first class of students were risk-takers, because being part of a new program meant their credentials might be called into question.

"We were very fortunate," says Evans. "Ideas are one thing, but the people make all the difference."

Dr. Evans also made significant contributions as an international health advisor and researcher, conducting a global study of public health and population-based medicine in 1979 and chairing the international Commission on Health Research for Development in 1988.

Community of Distinction Members

Harry Thode, president of McMaster from 1961 to 1972

Murray Enkin, an advocate for change, and faculty member in obstetrics and gynecology

David Sackett, founder of Canada's first Department of Clinical Epidemiology & Biostatistics

May Cohen, family physician and promoter of the equality of women in medicine

John Basmajian, professor of medicine and biomedical sciences, and a leader in the field of rehabilitation science

Alma Reid, director of the School of Nursing from 1949 to 1970.

Jerry Dolovich, pediatrician and founder of the Division of Allergy and Immunology at McMaster

Fraser Mustard, instrumental in the development of the new medical school curriculum and its research capability

John Evans, the founding Dean of McMaster's Faculty of Medicine.

continued from page 2



Taking a bath in the Rub a Dub Dub, Drop Your Stuff in the Tub bathtub, from left, are co-ordinators Alana Kayfetz, Jessica Wasserman and Hanieh Rahimi.

Rub-a-dub-dub, three girls in a crowded tub

The bathtub in the McMaster University Students Centre marketplace overflows with generosity. Toothbrushes, hotel-sized lotion bottles, bars of deodorant and little yellow ducks nearly spill over the side, as another person walks up and hands a bag of items to donate.

The immense goodwill of McMaster is amazing to the five co-ordinators of the first annual Rub a Dub Dub, Drop Your Stuff in the Tub project. The co-ordinators -- Jessica Wasserman, Hanieh Rahimi, Alana Kayfetz, Cole Bassarab and Stephanie Forrest -- as well as an army of volunteers are collecting toiletries and stocking stuffer toys for holiday gift baskets for battered women's and children's shelters of the Hamilton community.

"We have received phenomenal contributions so far," says Kayfetz, a second-year communications and women's studies student. "We are overwhelmed by the response."

Immediately following the project's Nov. 10 launch, students came to the organizers with bags of toiletries and cash donations. They also received several corporate donations, including boxes of toothbrushes from Johnson and Johnson, body lotion from Aveeno and travel-sized toiletries from local hotels. By Dec. 6, they hope to raise \$1,000, which they will use to purchase additional toiletries most in need by the shelters.

Shelters that will benefit include Martha House, Mary's Place, Inasmuch Shelter, Interval House, Native Women's Center, Sexual Assault Center (Hamilton and Area) and the Women's Shelter of Hamilton.

The co-ordinators will donate the items to shelter representatives at McMaster's Dec. 6 memorial for the National Day of Remembrance and Action on Violence Against Women. Beginning at 7:30 p.m. in front of Gilmour Hall, McMaster will host a candlelight vigil and walk to remember victims of violence and the women killed on Dec. 6, 1989 at Ecole Polytechnique.

Not only does the project support battered women's shelters in the community, it has brought several campus groups together, including the Jewish Students Association (JSA), Muslim Students Association and Iranian Students groups."

Donations can be dropped off at the JSA office in the Commons Building, Rm. B103, the Chaplaincy Center, MUSC, Rm. 231 or they can be picked up upon

request. To have donations picked up contact Jessica.Wasserman@learnlink.mcmaster.ca or call the JSA office at 905-522-7215. Donations also can be made at the Phoenix Fitness Health Club at 1685 Main Street West and at the Westdale high school and Dalewood Elementary School.

— CHANTALL VAN RAAY

McMaster biophysicist wins award for research

McMaster's Cécile Fradin is among five budding Ontario researchers to receive the prestigious John Charles Polanyi Prize.

The biophysics professor, who is conducting research into cellular dynamics in a newly renovated research lab in the Arthur Bourns Building, will receive \$15,000 from the province.

Fradin's research involves using laser optics to study the dynamics of biological systems such as cells. Her research has the potential to aid the understanding of how defects in membrane composition and integrity are affected by disease, drugs and toxic substances.

"The Polanyi prize recognizes the promise and potential of our young researchers. Cécile Fradin is acknowledged as a world-class leader in her field of research and I am delighted she has received this honour," says Mamdouh Shoukri, vice-president, research & international affairs.

The prize was established in honour of the achievement of John Charles Polanyi, recipient of the 1986 Nobel Prize in Chemistry. The Province of Ontario established the prize to provide annually up to five awards to outstanding researchers in the early stages of their career who are continuing to post-doctoral studies at an Ontario university. The prizes have a value of \$15,000 each and are available in the areas broadly defined as physics, chemistry, physiology or medicine, literature and economic science.

Undergrad enrolment up nearly 14%

McMaster's preliminary enrolment figures for the 2003-2004 academic year (as of Nov. 1) show full-time undergraduate enrolment at 16,703 up 13.7 per cent from a year ago, with 5,574 students enrolled in level 1. This is slightly above McMaster's overall enrolment target for full-time undergraduate students, which was 15,361, with 5,130 in level 1. Full-time undergraduate enrolment in 2002-2003 was 14,692.

Graduate enrolment is also up from last year and is now at 2,269 full-time graduate students. Final enrolment numbers will be presented to Senate in December.

Globalization Studies

A new Master's program in Globalization Studies at McMaster will be the first of its kind in Canada. Administered by the Institute on Globalization and the Human Condition, the program will provide students with the opportunity to think creatively about and conduct interdisciplinary research related to a central process of the contemporary era: globalization. The program brings together social science and humanities perspectives on globalization.

Students of a new Professional Masters program in Engineering and Public Policy will acquire an enhanced understanding of public policy and its effects on technological, social and ecological systems.

Advanced engineering studies, innovation and entrepreneurial skills development and engineering enterprise, are the three components of a new Master's program in Engineering in Entrepreneurship and Innovation. Students will graduate with leading edge engineering skills through business stream activities.

Offered through the engineering departments of McMaster, Queen's University, University of Toronto, University of Waterloo and the University of Western Ontario, a new Master's Program in Nuclear Engineering was prompted by the University Network of Excellence in Nuclear Engineering. The self-funded, full-cost recovery program will comprise the application of nuclear science and technology.

Shining new light on genetic research

Necessity the mother of this invention

BY DANELLE D'ALVISE

It wasn't exactly a "Eureka!" moment, but while sitting on a plane bound for a Genome Canada meeting in Calgary, biochemist Yingfu Li realized that his lab might be closer to building a better mouse-trap.

Li, a Canada Research Chair in Directed Evolution of Nucleic Acids, was studying a revised design for a new kind of molecular beacon he had developed with Razvan Nutiu, one of his PhD graduate students.

Molecular beacons are hairpin-like fluorescent DNA probes – little lighthouses on a molecular scale – that actually light up when they detect a specific DNA sequence.

Molecular beacons can detect mutations in DNA, such as those mutations that cause disease and can also be used to find new drugs to target disease or to develop a gene therapy.

There is, however, one significant drawback to using molecular beacons in research.

"They are beautiful gene detection tools," acknowledges Nutiu, "but they are very, very expensive."

Li remembers that when he first came to McMaster, he was appalled at the cost of molecular beacons. "At \$400 US per unit, there was no way I could afford to use a great number of them in my research," he says.

So what do you do when your research involves using expensive, cost-prohibitive technologies? If you're Yingfu Li, you start developing a better and cheaper alternative.

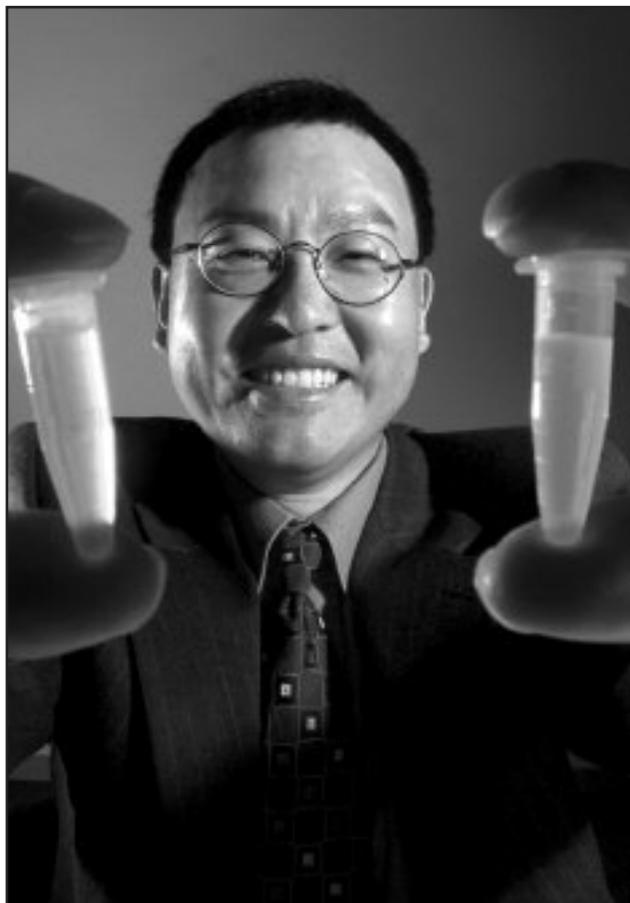
The very first task Razvan Nutiu was given in Li's lab was to begin work on a new design for a molecular beacon. He spent his first month studying the literature, drawing and designing.

Molecular beacons are a relatively new technology, first developed in 1996. A standard molecular beacon is a DNA probe doubly labeled with a fluorophore and quencher. These labels as well as the purification process, contributes to the high cost. The use of molecular beacons is hardly practical in situations where hundreds, or even thousands, of different DNA sequences need to be detected simultaneously or separately.

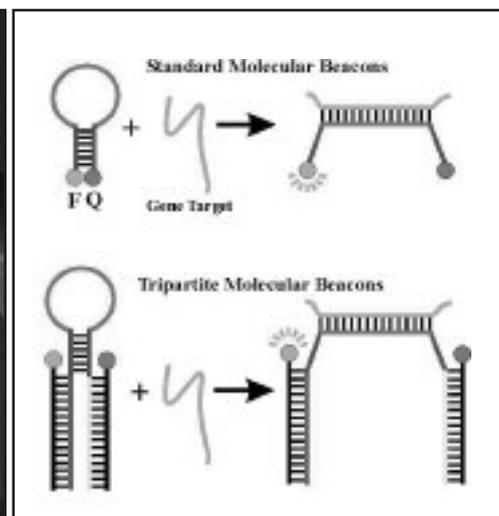
To overcome the problems associated with standard molecular beacons, Li and Nutiu developed a new format of molecular beacon, a creation that took more than a few lab trials to perfect.

"Sometimes with research, what happens in the lab results in more bad news than good news. You're not always successful, but it's important to analyze why things went wrong and make the right changes. Whether you'll have a success or a failure, it's important to have a dream and work on it," says Li.

It was on that plane to Calgary that Li looked at Nutiu's latest construct: a new type



Biochemist Yingfu Li holds test tubes containing a high concentration of fluorescent DNA probes.



"WHETHER YOU'LL HAVE A SUCCESS OR A FAILURE, IT'S IMPORTANT TO HAVE A DREAM AND WORK ON IT," - LI

of molecular beacon they termed "tripartite molecular beacon" (TMB) in which the labels are on different DNA strands. While on the plane, Li tweaked the design and called Nutiu to try his revised design in the lab. It worked.

They tested some more and finally published their results in the *Nucleic Acids Research* journal in the summer of 2002.

Their new design, the TMB, will cost only \$40 - \$50 Canadian per unit – a ten-fold savings that will impact the way genetic research using molecular beacons is conducted.

"Our TMB arose from a particular problem: we conducted practical, basic research and developed a generic technology from which others can benefit," says Li.

Or, as one of the members from the lab joked, "You turned a Mercedes into a Volkswagen."

The icing on the cake came in November of 2002 when Li was awarded a \$100,000 Proof of Principle (POP) award from the Canadian Institutes of Health Research (CIHR). The success was a joint effort between his group and the Office of Research Contracts and Intellectual Property (ORCIP). Li wrote a scientific proposal and ORCIP put together a business case. This special grant has allowed Li to recruit a postdoctoral fellow, Naveen

Kumar, and to conduct more in-depth studies of TMBs.

The Proof of Principle Initiative Competition was designed to advance discoveries or inventions to a stage where they can be commercialized or licensed. Li's proposal was one of 50 received from across Canada and one of only 19 that were funded.

Li's lab continues to research the TMB system and halfway through the POP project he has three goals he would like to achieve. First, he wants to improve the performance of the TMB and be in a situation where companies using his technology could actually offer quality guarantees to their customers.

He would also like to demonstrate the usefulness of TMBs and their ability to detect many different targets of interest in a single test. Finally, he'd like to construct a new DNA chip to explore molecular beacons as a high throughput screening tool.

"It's important to do non-traditional, creative research and constantly challenge yourself to find new and different solutions. Programs like the Proof of Principle award allow researchers to bring those solutions to the research community and industry," says Li.

"And," Nutiu adds, "to have \$100,000 to work on one project has been amazing."

Learning the lingo

Students who are new to English learn colloquialisms abound

BY LISA CAINES



A shrug of the shoulders, a sarcastic remark, or a common phrase that makes reference to an historic parable can communicate different messages in English, Arabic and French. But for a student whose first language isn't English, those subtle innuendos can make a big difference in how well they process and understand what others are saying.

For the hundreds of international students attending McMaster each year, tackling the pace, material and workload of university-level courses is coupled with the pressure of adapting to a new culture, climate, and language. Now, McMaster's commitment to meeting those students' needs has seen the recently-expanded English as a Second Language (ESL) courses reach new levels of popularity.

Rosette Adera and Claire Rivlin, the Centre for Student Development's English as a Second Language (ESL) instructors and coordinators, say many students who are new to English and Canada have no idea how well or poorly they'll do in real-life foreign language situations until they arrive.

"A lot of students can read and write well, but often their listening and speaking skills need work," says Rivlin. "Sometimes the English-language education they received in their home country doesn't coincide with their needs to understand lectures, ask questions, and express opinions in an academic environment."

But the students aren't arriving unprepared. Many spend months or years taking intensive language courses. Before their applications to study abroad are accepted, they must pass a test of written English and TOEFL (test of English as a foreign language). Many McMaster departments have additional standards that students must meet before they embark on studies in their non-native language.

McMaster's new ESL courses are a compliment to long-standing support programs including Speak Easy and Conversation Circle, offering one-on-one or group conversation training. A career-focused language program, Opening Doors, helps students prepare for employment in English, providing help with resume writing, job search skills, and practice interviews.

"ESL students face a variety of emotions," say Adera and Rivlin. "A suc-

cessful interaction – when a message is conveyed and understood – can be the highlight of the day, but only an hour later they may find themselves in a more difficult interaction and that becomes incredibly frustrating."

This year marks the first year students can attend ESL courses on campus during the daytime. Previously they were encouraged to attend evening courses open to the public through the Hamilton-Wentworth District School Board. Adera says the new daytime courses are an excellent resource because they allow McMaster students who are new to Canada to form stronger relationships within their campus community.

Students who study abroad in any country often encounter what Rivlin calls a "honeymoon period", when they're fascinated with the differences in fashion, food, and social customs in their new country. She says that stage varies in duration for different people, but the best way to succeed as a student in a new country is a careful balance of enjoying the culture and staying on top of obligations.

"During the honeymoon period everything is new and exciting, but it's also important to keep pace with class requirements," says Rivlin. "It's easier to function in a new culture, and to speak a second or third language if you're not overwhelmed by how far behind you are on homework."

Before students are admitted to the free listening/speaking and reading/writing courses they must take an assessment test. Tests are offered free of charge, and they include listening, multiple choice, reading-comprehension and short essay components. They help Adera and Rivlin determine which classes a student would benefit from.

"International students travel a long way to attend McMaster, and usually they're coming because we have a good reputation for being student-centred, and a leader in innovation and quality," says Adera. "We should provide them with the resources that help them succeed here."

Classes are not for credit and they are intended to improve a student's academic excellence. Currently five daytime classes of 20 students are running, in addition to the Monday-Wednesday evening classes. More are set to begin in January.

English language assessment tests for January's classes will begin in early December. For more information about exact times and locations, visit csd.mcmaster.ca or contact Rosette Adera, ext 26229 or Claire Rivlin, ext. 26002.

"A LOT OF STUDENTS CAN READ AND WRITE WELL, BUT OFTEN THEIR LISTENING AND SPEAKING SKILLS NEED WORK."

– CLAIRE RIVLIN