

# McMaster Review

McMASTER UNIVERSITY'S MONTHLY NEWSMAGAZINE

VOLUME 2, NUMBER 3

10 March 2003



## inside

- Passionate spirit drives director
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- New approaches to discovery
- A biophysicist's groundbreaking technique

Ken Rosenthal, Amanda Jerome, and Ruth Toth view the new Centre for Learning & Discovery from the roof of the Life Sciences Building. Jerome, a student in McMaster's Bachelor of Health Sciences Program, and Rosenthal, a professor of pathology and molecular medicine, will have classes and labs in the new facility when it opens next year. Toth is involved in planning the ground floor classrooms and lecture halls.

## Opening doors to a brighter future



It will be a building for students and new ideas. Construction on McMaster's Centre for Learning and Discovery, the University's 300,000-sq.-ft, five-storey expansion to the north side of the McMaster Health Sciences Centre is now well under way, with the completion of the building scheduled for summer 2004.

The new facility will provide much needed space for teaching, learning and research, and will address a number of critical needs. Students and faculty will benefit from the state-of-the-art, enhanced learning environment and researchers and scientists will have new space to carry out their work and explore new approaches to discovery.

Six classrooms and five large lecture theatres for classes from all Faculties make up the primary elements of the first floor. One theatre, with 600 seats, will be the largest seating space on campus. Altogether, the first floor will seat more than 1,800 students and will help McMaster address the needs created by the double cohort.

The second floor will connect to the McMaster University Medical Centre and be used for patient care. Plans for this floor are still being finalized.

The third floor will be dedicated to the needs of the Faculty of Health Sciences with classrooms, tutorial and meeting rooms and offices for students and educators. A Rounds Room on this floor will have state-of-the-art teleconferencing facilities, allowing students at hospitals across the city or throughout the province to join in discussions as if they were sitting in the room.

The fourth floor, and most of the fifth, will showcase the Institute for Molecular Medicine and Health, which includes the Centre for Gene Therapeutics and is a prototype for the University's new revolution in health sciences education and research. The two floors will contain a variety of offices, wet laboratories and a biotechnology incubator.

*For the full story, see pages 4-6.*

## TA AGREEMENT RATIFIED

McMaster's teaching assistants (TAs) and the University ratified a new collective agreement in February.

The new 28-month collective agreement provides for wage increases to the graduate, undergraduate student rate. Other adjustments include equating the fifth and subsequent years doctoral rate to the graduate rate by next September, and increasing the rate for all others covered by the agreement such that it is level with the undergraduate rate by Sept. 1, 2004.

There were also increases to the dental benefit and to the benefit fund that is administered by the union.

## BONEY WINS MSU RACE

Neville Boney has been elected the 2003-04 president of the McMaster Students Union (MSU). He won a close race on the sixth ballot of preferential voting with a total of 1,607 votes. Boney, who has a degree in kinesiology and has finished year one of a second degree in French, is currently vice-president administration for the MSU.

## DANCE OF THE LION

McMaster's Chinese Students Association, one of the largest and oldest student organizations on campus, celebrated the Chinese Lunar New Year with a traditional Lion Dance on Feb. 5.

As part of this tradition, McMaster President Peter George, McMaster Students Union president Evan Mackintosh and Luke Chan, executive director of the Office of International Affairs, dotted the lions' eyes prior to the dance to awaken the lions' spirits. This was the first time in the 36-year-old association's history that it has celebrated the traditional Lion Dance on campus.

## PENSION SURPLUS DISTRIBUTED

The distribution of McMaster's pension surplus took place in February following a green light from the Financial Services Commission of Ontario (FSCO).

Discussions between the McMaster Employees' Surplus Sharing Committee and the University over the distribution lasted more than four years. During the negotiations, the University and the committee (representing approximately 4,500 pension plan members) agreed that each group would share the \$150-million surplus – \$75 million to be returned to plan members, including pensioners, and \$75 million to be returned to the University to fund other initiatives.

## BATTLING PLAGIARISM

McMaster is battling plagiarism with Turnitin.com, a computer software package designed to reveal cheating. Turnitin.com is used by a number of Canadian universities, including the University of Western Ontario, the University of Toronto and York University.

With Turnitin.com, faculty members register onto its Web site and submit a course assignment. Students then submit their papers electronically and hand in a hard copy to their professor. The papers are compared to billions of pages of content located on the internet and in its own databases. Within 24 hours, professors receive an "originality report" containing the results of those comparisons.

*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>*

# BUILDING A MORE INCLUSIVE COMMUNITY

Issues of diversity, inclusion and equity will gain a higher profile at McMaster with the recent establishment of a presidential advisory committee.

University President Peter George created the President's Advisory Committee on Building an Inclusive Community as part of his and McMaster's commitment to a community that celebrates, fosters and respects diversity.

"The University fosters an environment of diversity and inclusivity. It is part of our culture and is something we should all celebrate," says George. "One of our principal purposes as a University is to make possible the expression of a wide range of views, cultures and lifestyles. It is my hope that this committee will help to strengthen our commitment to these issues and will assist us in building a stronger, more inclusive community for all."

The committee will act as an advisory body to the President on a variety of issues, including:

- recommending strategies to identify and eliminate practices which may have the effect of being discriminatory,
- providing a forum for the advancement of issues relevant to diversity, inclusion and equity; and

- facilitating communication and co-ordination on campus among those groups and bodies that are interested in advancing the principles of diversity.

The committee will be developing a statement embodying McMaster's commitment to diversity.

The committee is co-chaired by University Provost Ken Norrie and McMaster Students Union President Evan Mackintosh, and consists of representatives from numerous campus groups and organizations, including: the Senate Committee on Human Rights, the MSU Committee on Human Rights, the Ombuds Office, the Sexual Harassment and Anti-Discrimination Office, the faculty, staff, graduate students, and part-time students associations, Women's Studies, The Gay, Lesbian Bisexual and Transgendered Centre, the Anti-Violence Network, Peace Studies, and many others.

"This committee is very important to the University and I'm pleased to be co-chairing it with the MSU president. McMaster already has a number of initiatives in place which encourage and foster diversity. In bringing these groups together we have an opportunity collectively to build on these achievements," says Provost Ken Norrie.

### Our mistake

Our apologies to biology professor Ita O'Kelly, whose name we misspelled in our last issue. O'Kelly was one of a number of professors who were interviewed for our feature on faculty renewal. We regret any inconvenience or embarrassment the error may have caused.

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## She's a team player with a passionate spirit and a strong allegiance to community

Athletics & Recreation director Therese Quigley

BY ELAINE HUJER

**T**herese Quigley, McMaster's director of Athletics & Recreation, feels "very blessed" to have lived and worked in McMaster's supportive community for 18 years. And her best years, she vows, are still ahead of her.

Quigley's drive and enthusiasm, along with exceptional teaching, coaching and management skills have brought her a long way. Growing up in London, Ontario, in a family of seven children, she remembers sports as her earliest passion. From the age of six, she played competitively and by her twelfth year, tennis had become the major focus.

She says, "There were public courts about a block and a half from me and London had a very good junior development program. You didn't have to be wealthy to play and many of the players did not come from families who could afford to pay membership fees. A lot of them became tennis professionals. We played at a high level; it was very competitive. Clearly, my whole career grew from the sporting experiences I had at a young age."

Quigley notes, however, that in those days, there were few opportunities for girls to participate in any kind of team or structured sports. It wasn't until later, while she was attending high school and at the University of Western Ontario, that girls and women were provided more options to compete in a variety of sports. There, she switched her allegiance to volleyball (where she was named the school's Female Player of the Year in 1975) and played on the Canadian national volleyball team from 1972 to 1974. She sees this as a significant period of transition.

"My personality really led me to be interested in team sports. There is nothing like accomplishing something in a team. Why it's so satisfying is hard to put into words, but it's a very different sense of accomplishment. Perhaps coming from a large family, you learn the value of co-operation, of working things out ... Certain personality types are very interactive and I just find the team concept very appealing."

After teaching high school in London for four years, Quigley completed her MA at the University of Alberta. She came to McMaster in 1984 as head coach of the women's varsity volleyball team and lecturer in the School of Physical Education & Athletics. In the early nineties, when the Department of Kinesiology separated from Athletics & Recreation, she had to make a choice.

"The two diplomas are very different," she says, "and I went where my heart was, where I felt I could make the greatest contribution. I've been very happy with my decision."

Something of a trailblazer, in 1990 Quigley became the first woman director of athletics and recreation in Ontario. She happily notes that, now, 40 per cent of the schools in Ontario have women as athletic directors. In 1993, The Sports Network (TSN) established an award in Quigley's name, recognizing the three-time Ontario Women's



THERESE QUIGLEY IS THE CONSUMMATE SPORTS FAN AND VOLUNTEER. THE SPORTS NETWORK (TSN) ESTABLISHED A STUDENT AWARD IN HER HONOUR IN THE EARLY 1990S.

Interuniversity Athletic Association Coach of the Year's leadership in and contribution to sport. The Therese Quigley/TSN Leadership Award is presented annually to a female student-athlete who has exhibited outstanding achievement in three areas: volleyball, academics and community involvement. In 1994, she was named Hamilton's Woman of the Year in Sport, Health and Fitness. Last November, Sheila Copps presented her with a Spirit Award for her contributions to sports in Hamilton.

She's grateful for the recognition, but one of her proudest achievements is the work of the Department of Athletics & Recreation in establishing The Pulse Fitness Centre.

"We had this old weight room in the sub-basement. The air quality was poor and the space wasn't meeting the needs of students. We converted it into The Pulse and it went from being archaic to a state-of-the-art facility. Participation levels have grown well beyond the capacity of our current facility

and we have been working on a facility expansion for several years. The growing numbers are reflective of the entire program, not just The Pulse."

That opportunity for expansion will come, Quigley believes, with her current pre-occupation, the 2010 Commonwealth Games bid. She is optimistic about Hamilton's chances of hosting the Games and speaks eloquently about the benefits that this will bring to McMaster and to Hamilton.

"The legacy left here in Hamilton and at McMaster will be tremendous and the Games will give us an opportunity to demonstrate to the Commonwealth what Hamilton and McMaster have to offer. We only have to look to Edmonton, Alberta to see the impact of hosting the Commonwealth Games. People still refer to the Games held in Edmonton in 1978 as being transformational – a renaissance in the community. The Commonwealth Games were a catalyst for growth and development; they gave the city an opportunity to position itself in a more international forum."

Quigley sits as a volunteer on the bid committee for the Games and expects that volunteerism will continue as a natural and necessary part of her life.

"When people ask me what I like best about my job, I always say, after five and weekends. Everyone laughs, but then I explain: that is when all the teams compete and everything comes alive. My regular job is like any other. It has its rewards. But involvement with sport is what I love to do. If it wasn't my career, I'd be there as a volunteer. No matter how old I am, I know I'm going to be involved."

# Building a better learning environment

BY KELLY CURWIN

Opportunities to build custom, state-of-the-art classrooms for students don't come along very often.

Planning for the ground floor of the new Centre has centred on the development of new lecture theatres and classrooms, and ensuring these new facilities are physically comfortable, aesthetically appealing and technologically superior. The goal is to create a better learning environment, a better classroom, for students. The facilities on this floor will be available to all students.

"Our students will find these new lecture halls very appealing," says Ruth Toth, assistant registrar scheduling and examinations, who has been involved in the planning. We know it's important to provide an attractive learning environment for students, especially in large classrooms. These new facilities will definitely do that."

In all, this floor will house five (or six) large lecture halls. The largest will seat 600 students and, with the push of a button, can be split into two smaller lecture theatres of 300 seats each.

Several McMaster professors met with the architects to discuss the new facility and specific educational needs.

School of Geography & Geology instructor Carolyn Eyles was thrilled to have the opportunity to identify design features and elements that would enhance the student learning experience. "We talked to the designers and architect about the kinds of needs we foresaw for dealing with large classes. One concern we had is that a large room limits the instructor's ability to involve the students in the lecture and we also felt it was important that students be able to interact with one another and with their professor even in a large lecture setting." To address the latter concern, the seats in the lecture hall will have a 90-degree turnout, which will enable students to form groups within the classroom, with students both beside and behind them.

"It's very, very exciting to actually have instructors involved in this process," says Eyles, an award-winning professor. "The ability for students to do something in a lecture room where they are actually engaged in the learning, is very important." She says the new lecture theatres will make it easier for faculty to adopt and apply new and different teaching strategies for teaching to large classes (for example, doing small group work in a large lecture hall).

The lecture theatres will be equipped with

deluxe mobile multimedia cabinets that will make it easy for instructors to provide information in a multitude of formats for students – from very basic overhead projector displays to more complex digital images and video clips.

One noteworthy and interesting feature currently being explored is the installation of a special projector and video screen in one of the lecture theatres that would enable 3-D visual displays of images of the galaxy and the inner workings of the body. Students would wear 3-D glasses to gain a three-dimensional view of images projected both vertically and horizontally on the screen.

"The new Centre for Learning & Discovery will be arriving at a pretty good time when you consider the current growth in post-secondary enrolment, partially due to the double cohort group," says Amanda Jerome, a third-year Bachelor of Health Sciences Program student who will be among the first to use the new building.

"Right now the Bachelor of Health Sciences Program has nowhere to call its own. This (new building) will fill that gap. Many of us find that the library is our only option for meetings. The new classrooms and tutorial rooms will be better for these kind of group meetings and it will also be great to study in a building that has hospital and research labs available."

As administrator of academic services for the Faculty of Health Sciences, Roberta Shaw has helped to plan and develop the third floor of the new Centre. It's precisely students like Amanda that Shaw and fellow planners in the Faculty had in mind when it came to planning the facility.

"We are building eight meeting rooms to accommodate 22 to 25 people each and they're going to be used by our graduate students and students in the Bachelor of Health Sciences Program when they have their inquiry groups." Shaw says most facilities will be outfitted with state-of-the-art components, such as digital technology, multimedia podiums and internet access.

The education and research divisions in health sciences will share the third floor; one-half of the total 37,500-sq. ft. floor space will be devoted to educational needs: four new classrooms, 10 tutorial rooms and eight inquiry group rooms will be constructed. The space will also house the Program for Educational Research and Development, the Faculty Development Program and



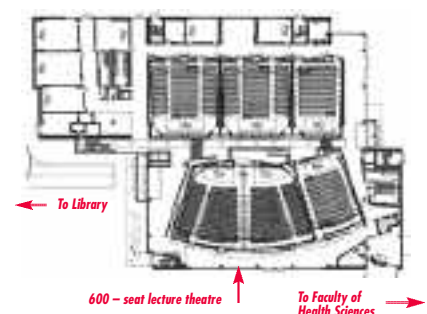
the Continuing Health Sciences Education program.

Given the incredible space crunch on campus, Susan Denburg, associate dean academic, Faculty of Health Sciences, says the value of having up to date, well-designed space cannot be underestimated. "It's a major advance. It's good for morale and it helps to create an environment of 'hassle-free' teaching and learning."

The centerpiece for the floor will be the Rounds Room, which will accommodate up to 140 students. "It is the most sophisticated element of the new floor," explains Shaw. The room will be used for clinical and grand rounds, the post-graduate program and by physicians and international speakers. "What's exciting about this room is that it will have an electronic white board and full video-conferencing capabilities, which will enable students who are in rural and northern settings to participate electronically in educational activities, as well as interact with fellow learners at McMaster." Many of the facilities and electronic enhancements are in response to what students say they want and need.

Denburg says the room is "critical for our students who are involved in a distributed model of learning. Students in such places as Thunder Bay or St. Catharines will be able to 'beam back' to the academic centre and attend educational activities as if they were on campus. That's essential as we send more students to outlying areas to complete their studies."

Ground Floor Plan





**The campus skyline will change with the construction of the new building.**

# New approaches to discovery

**K**aren Mossman, Mary Hitt and Ken Rosenthal are keeping a watchful eye on the development of the new Centre for Learning & Discovery. They are among those researchers who will relocate to the fourth and fifth floors of the new building as part of the Institute for Molecular Medicine and Health. They can hardly wait!

The new space will encompass several mega laboratories in an open concept design, providing new bench space, and creating separate rooms for equipment and specialized facilities such as tissue culture rooms, a unique vector production facility and a biotechnology incubator.

“Build faster, that’s what we say,” remarks assistant professor of pathology and molecular medicine Karen Mossman who, like many others, is working in tight research quarters now. “The thing we’re most excited about is the gain in lab space. Our tissue culture facilities will be sequestered from our actual bench areas so that will be phenomenal. The tissue culture will be in its own area, which is important because we have Level II agents such as viruses and cells. It’s going to be great.” A molecular virologist, tissue culture is an important part of Mossman’s work: she studies viral infections in living cells to determine cellular responses to viruses and foreign particles entering cells.

Like other buildings on campus, space is at a premium in the Health Sciences Centre, one reason the new building is so desperately needed. All three re-

searchers say the lab set-up in the new facility will also help to create a new synergy and interaction among researchers that will bring new approaches to discovery.

That there are no walls in these laboratories to separate them from one another says much about these researchers and their approach and perspective when it comes to finding ways to solve today’s

medical problems. They are used to sharing everything from space to people to equipment and they do it very well.

“If people can link together in groups or networks attacking biological problems, those problems can be solved more readily,” remarks pathology professor Rosenthal, whose labs will be located on the fourth floor, next to fellow scientists Jack Gaudie and Mary Hitt. “It also reflects in part that solving medical science problems today involves coming at a problem from different angles with different technologies and skills. So, we’ve become much more specialized today and by working with others you really start to see the synergies when you attack these problems.”

Rosenthal’s work is aimed at understanding how immunity works at the mucosal membranes and using this knowledge to develop vaccines that trigger the body’s immune system to protect it against infections that enter the body via the lungs, gut or genital tract. “Our work links with Mary Hitt’s because

*cont’d on page 6*



**Researcher Karen Mossman**

## New approaches to discovery

continued from page 5

she is working on the recombinant adenovirus vectors. So she's essentially producing vectors or ways of delivering a vaccine using adenovirus. She's able to help us make or design vaccine delivery systems. Jonathan (Bramson) is also very interested in vaccines and immunity to viruses... We are all trying to determine how we can generate the strongest, longest-lasting immune responses."

Finding answers to these and other immune response questions will go a long way in developing new ways to treat cancer as well as respiratory, gut and genital tract diseases. McMaster enjoys research strengths in each of these areas. The Centre for Gene Therapeutics, begun in 1996, already has an impressive track record for investigating, creating and implementing ways to use genes as medicines in infectious diseases, cancer and lung diseases.

McMaster may be unique in bringing studies of cancer, respiratory illness and gastrointestinal disorders together – a distinction that will be further strengthened by this new integration of researchers. While Hitt and Rosenthal's areas are focused on cancer therapies and immune system responses to infections, another area of the fourth floor will focus on respiratory diseases such as asthma, allergies and chronic obstructive pulmonary disease. Also joining the group, on the fifth floor, will be John Hassell, a molecular biologist who studies genomics and proteomics.

A professor of pathology and molecular medicine and a member of the Centre for Gene Therapeutics, Mary Hitt is working on the development of gene

therapy vectors that minimize the side effects of anti-cancer agents without comprising their activity (that is their ability to destroy cancer cells). What excites her about the new Centre is the opportunity it provides to bring together researchers like herself, who conduct basic research on mouse models, with the clinicians who deliver the treatments to patients in clinical trials.

Ronan Foley is one clinician her group expects to work with more. Foley, an associate professor of pathology and molecular medicine working at Henderson Hospital, conducts clinical trials on cancer patients. "One of the big advantages of having him in the group is that there will be immediate feedback from the trials he does. Blood samples or tissue biopsies from patients can be brought back to the lab and we can analyze them and then fine tune the cancer treatment, possibly while the trial is still going on," says Hitt. "A basic researcher can look at the samples and go back to the mouse model if he/she needs to change something, say a dosage, and see what happens."

She thinks this relatively new bench to bedside approach, which will provide basic researchers with more access to patient samples, has huge advantages. Discoveries and treatments for diseases such as cancer will move more quickly from the lab to the patient. It will also help to distinguish McMaster. "It's really going to be bench to bedside and bedside to bench and back and forth... Having access to patient samples is going to change the way we think about things a lot. Instead of thinking of everything in terms of mice (and mouse models), we'll be thinking of tissues from patients and how we can tell if a treatment is really working on a patient. And if it's

not working then where is the block, where did it stop working?"

Hitt believes the new facility will also foster greater communication. Rosenthal agrees. "They have a large open concept lab at Université Laval in Quebec and it really works well. You can see there's a large esprit du corps among the faculty, students and staff and it generates a lot of excitement. People can see what others are doing."

The Good Manufacturing Practices Vector Facility that will be established on the fourth floor is generating excitement here. This highly specialized laboratory will enable McMaster to grow its own adenoviruses vectors of a quality suitable for injecting into patients, something neither McMaster – nor any other facility in Canada – can do now. Currently, if a researcher develops a vector for treating cancer he/she must head to the U.S. to have it developed. It's costly and can take up to three years, much too long for cancer patients participating in a gene therapy trial.

"The plan would be for the vectors to come straight out of this lab and be used in local clinical trials," says Hitt. The facility will also be available for use by other Ontario researchers.

The new Centre for Learning & Discovery will help ensure McMaster continues to grow as a leading centre in gene therapy, says Jack Gaudie, John Bienenstock Chair in Molecular Medicine, head of IMM and chair of pathology.

Funding sources for the building include the Canadian Foundation for Innovation, Hamilton Health Sciences, McMaster University, and private donors. The University has submitted an application to Ontario's SuperBuild fund.

## Review Advertising

### Advertise in the Review

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### How Are We Doing? The Review

Wants to Hear From You!

The *McMaster Review* is approaching the first anniversary of its publication. We would like to hear from you. We invite you to send your comments, suggestions and ideas about the stories and photographs that have appeared to date. **Please e-mail us at: [review@mcmaster.ca](mailto:review@mcmaster.ca)**

We will also be conducting a survey shortly to gauge reader feedback on this new publication. Feedback will be incorporated into future publication developments. A focus of this new publication has been on providing more information on emerging issues at McMaster. Over the past year we have featured stories on the following topics: faculty renewal, double cohort, parking, student volunteerism and commitment to community, campus construction and expansion, improving the workplace, research and innovation, the new student centre, and our campus plan.

Your views are important to us. We look forward to hearing from you!

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# Biophysicist uses laser optics to study the dynamics of cells

Cecile Fradin's groundbreaking technique

BY SHELLY EASTON

The Swiss and French Alps are what physics professor Cecile Fradin misses the most since coming to McMaster 16 months ago.

Hamilton's infamous mountain just isn't the kind of rugged terrain Fradin, a native of France, considers a challenge.

Instead, Fradin's new challenges are found in a newly renovated research lab in the Arthur Bourns Building where she is conducting research into cellular dynamics.

Her field of study, biophysics, is an amalgamation of biology and physics.

Fradin, who holds a Canada Research Chair in Molecular Biophysics, was always drawn to the area of optics in her studies that have taken her from the heart of Paris, to Pisa, Italy, New York and Israel.

"I've always liked experiments that involved optics," she says. "I like to be able to see things with my own eyes instead of reconstructing them."

Fradin's research involves using laser optics to study the dynamics of biological systems such as cells.

"We're trying to look at how fast proteins are moving inside cells, how fast they can be transported across membranes and how fast they can change conformation," she says. "There are many processes where we know what proteins are performing but we don't know how it is occurring. Another important question is where is the energy coming from to make this happen."

To picture a cell, imagine you have a box full of little Lego bricks (the proteins), she suggests. The bricks have different shapes and different colours that can assemble to form large organized structures and these bricks and larger structures are moving. In her experiments, Fradin uses light or fluorescent microscopy to observe the fluorescent emission coming from one specific type of brick.

To make the desired bricks fluorescent, a possible method is to insert modified DNA into the cell, which then directly produces fluorescent proteins. "The cell is doing the work for us," she notes.

The goal of Fradin's research is to better understand some of the precise cell processes that are at work. For example, she is keenly interested in nuclear transport or the transport of macromolecules in and out of the nucleus to other areas of the cell. One of her current research projects is examining how quickly a protein crosses the nuclear membrane. Another experiment will provide

information on the fluctuation of molecules – how fast can a protein change its shape.

"A long-term goal is to look at how we can use biological bricks to construct our own bricks to do what we want instead of what the cell wants," she explains. "Proteins self-assemble. If we can figure out how to use them to do what we want there is lots of potential."

Understanding these processes will eventually aid in the development of gene therapies that could contribute to healthier humans or contribute more knowledge about conditions such as viral infections. As well, the new experimental tech-

niques she is working with may eventually be transferred to the high-tech industry.

She is already integrating two state-of-the-art technologies – fluorescence correlation spectroscopy with fluorescence resonance energy transfer – to measure protein movements. The technique is groundbreaking and will contribute to the development of highly skilled researchers in the evolving fields of biophysics and laser optics.

Fradin acknowledges her love of science comes from "being born in a scientific family." Her mother, a math teacher, played an integral role in her pursuit of the sciences.

She says her early scientific interests also evolved from delving into the many scientific journals her parents subscribed to and which she eagerly read.

Journals that offered mathematical puzzles and *Science et Vie*, the French equivalent of *Scientific American*, were influential as was *La Hulotte*, a small periodical that she still reads. Each issue is devoted to a comprehensive description of a small animal.

During her undergraduate and PhD studies, Fradin focused on a combination of mathematics, physics and chemistry because she didn't feel biology was an "exact science." It wasn't until her post-doctoral studies that she considered the combination of biology and physics to be something she

wanted to pursue.

"It seemed that biology, when studied with a physicist's approach, could be an exact science after all. So I decided to start a biophysics project, studying the transport of proteins inside cells with fluorescence microscopy, in the group of Michael Elbaum at the Weizmann Institute of Sciences in Israel."

Her post-doctoral studies required her to study biochemistry, a challenging but necessary frustration that convinced her she had found the right research area.

Now, in addition to her research, she is working with colleague Paul Higgs, the Canada Research Chair in Bioinformatics, to develop a new biophysics stream for McMaster undergraduates.

Fradin says developing the new study stream is both rewarding and an opportunity to step back and take a look at the big picture.

"It's exciting to develop a new course; there are no textbooks that cover the whole topic and it is interesting to do the synthesis and collaboration," she says. "It will be good for my research too."



CECILE FRADIN USES LIGHT OR FLUORESCENT MICROSCOPY TO STUDY THE MOVEMENTS OF PROTEINS AND CELLULAR DYNAMICS. HER FIELD OF STUDY, BIOPHYSICS, IS AN AMALGAMATION OF BIOLOGY AND PHYSICS. FRADIN'S LOVE FOR SCIENCE GREW OUT OF BEING BORN INTO A SCIENTIFIC FAMILY AND A CHILDHOOD THAT INCLUDED READING HER PARENT'S SCIENTIFIC JOURNALS.

## Inquiry and small-group learning are hallmarks of health sciences program

Popular program continues to attract high-calibre students

BY JULIA THOMSON

McMaster enjoys a tradition of innovation across the University. In the Faculty of Health Sciences, they're demonstrating some of their innovative approaches to education through the Bachelor of Health Sciences (BHSc) Program.

Currently one of McMaster's most popular and premier programs, the honours program has grown to 300 students since it was first offered in September 2000. The program continues to enjoy much success, with more than 3,000 prospective students applying this year.

The growth in this program is one reason McMaster needs additional space. The University is building a new Centre for Learning & Discovery (see cover story inside) which will provide these and other health sciences students with specialized space to conduct classes in inquiry and small-group learning, hallmarks of this new program.

Students who are admitted to the program hold high averages in studies such as English, biology, chemistry and calculus, are involved in extracurricular activities and are interested in health issues. They are also well-rounded in their studies because the BHSc Program uses a unique interdisciplinary approach to the study of health. Students gain an understanding of health from biological, behavioural, and population-based perspectives.

McMaster's internationally known expertise in problem-based, self-directed learning is a big feature of the program. This approach provides students with skills that will facilitate learning now and later in their careers.

The program's assistant dean, professor of pathology and molecular medicine Del Harnish, states that the heavy emphasis on inquiry classes is the most unique and valuable aspect of the program. "Inquiry will be very valuable to these students in the long term. It will enable them to develop critical thinking skills and to take an active role in their own educations."

The interdisciplinary dimension is another valuable aspect of the program, and one that Harnish would like to see developed further. Currently, students have the opportunity to select electives in any area of study.

Susan Denburg, associate dean academic,

Faculty of Health Sciences, explains that "having the combined challenge of the Nursing Consortium and the new Bachelor of Health Sciences Program has encouraged us to think of new ways of developing and delivering undergraduate programs. This has resulted in creative interdisciplinary and cross-Faculty collaboration."

Class sizes are small, allowing for more direct contact between professors and students. Third-year student Sean Park cites the small community of learners as crucial to the program experience. "My

experience in the program or at McMaster would not be the same without my fellow students... Whenever I'm working on projects or extra-curricular activities with any of them, I quickly recognize the skills, experience, knowledge, and insight they bring to the table."

What students will go on to in life is a big part of the Bachelor of Health Sciences Program. Pat Harris, associate registrar liaison, Office of the Registrar, says the BHSc Program garners a lot of interest from high school students, many of whom are interested in medicine and believe this program will be the best for them and/or "give them an edge" when applying to medical schools.

Although the curriculum and teaching philosophy are consistent with the requirements of many health care professional programs, including medicine, it is not a pre-med program.

"Ninety-eight per cent of our students in first year are interested in being physicians," explains Harnish. "By third year, it's down to about sixty per cent." Part of the goal of the program is to make students aware of other career opportunities in the health field. Some of these opportunities, beyond medicine, include dentistry, occupational therapy and physiotherapy, rehabilitation sciences, health administration, the pharmaceutical & insurance industry, and hospital and community agencies.

The program has made Park aware that other opportunities exist. "There are more directions possible than I thought. I still have no idea what I would like to do, but I am very interested in learning and education, alternative transportation and cycling and some aspects of health and politics."

McMaster's Bachelor of Health Sciences Program is the only program in Ontario that draws on the full range of departments within health sciences, including medicine, pathology and molecular medicine, psychiatry & behavioural neurosciences, and clinical epidemiology & biostatistics.

Other universities in Ontario offer similar programs but McMaster's is unique in that it is formally part of the Faculty of Health Sciences. Other academic institutions in Canada have used McMaster's program as a model to build their own BHSc programs.



Del Harnish, professor and assistant dean of the Bachelor of Health Sciences Program (back left), and students, (l-r) Andreanne Benidir, Stacy Deniz, Sean Park, Anusha Rayar and Rich Sztramko, study a plastic model of the human body.

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