



## CAN trainee studies MRI techniques in Germany

EMILY McWALTER BUBBLES over with enthusiasm when she talks about her three and a half month placement last fall in Dr. Felix Eckstein's laboratory at Ludwig-Maximilian University in Munich, Germany. Dr. Eckstein's research group, based at the Institute of Anatomy, does quantitative MRI analysis of cartilage morphology of the hip, knee and ankle, and mechanical testing of bones.

After obtaining a degree in mechanical engineering from Queen's University in 2002, Ms. McWalter was interested in biomedical engineering and began work on her Master's degree under the supervision of CAN member Dr. David Wilson at the University of British Columbia. He was doing research in the field of patellar kinematics and has developed an MRI-based method of tracking the patella *in vivo*, a technique that measures how the patella moves as an individual bends the knee. One chosen area of application for the technique is



Emily McWalter

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osteoarthritis (OA). Ms. McWalter's thesis project investigates the possible relationship between varus and valgus leg alignment, patellar position, and cartilage thinning in patellofemoral OA. They considered various imaging techniques such as radiography, MRI and CT and decided the MRI-based technique developed by Dr. Eckstein's group was most suitable.

Ms. McWalter contacted the Network after reading about its Canada-Germany exchange program and spoke to Network member Dr. Frank Beier of the University of Western Ontario, who is responsible for the program. She was interested in working with Dr. Eckstein because his technique is known and

accepted worldwide as one of the only methods of quantitative cartilage morphology assessment that has been validated for accuracy. Ms. McWalter's goal was to analyze cartilage data collected from 12 participants in her study.

In order to carry out the analysis, she learned how to identify features of cartilage and bone pathology associated with OA. This was accomplished through a second project, which studied the use of different tools for cartilage segmentation from MRI images in six healthy knees and six knees with OA. The tools chosen for the comparison were a traditional computer mouse, an interactive digitizing

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# ChondroGene Limited

*Network members now have access to ChondroGene's proprietary technology and tools for osteoarthritis research, such as the ChondroChip™, the first known human cartilage-specific cDNA microarray to be developed.*

THE TWO ORGANIZATIONS entered into a research collaboration in December that will also give ChondroGene access to the Network's research activities at academic institutions across the country.

Dr. Robin Poole, the Network's scientific co-director said, "ChondroGene is a leader in osteoarthritis R&D and has technologies and tools that can be applied as catalysts in the development of new diagnostic tools and treatments. Access to these tools and to their scientific expertise will help Network investigators accelerate existing programs and initiate novel studies."

ChondroGene is a functional genomics company focused on personalized medicine and pharmacogenomics, co-founded by Dr. Wayne Marshall, an orthopaedic surgeon, knee sub-specialist and research scientist at Toronto Western Hospital and by Dr. C.C. Liew, Director of the Cardiovascular Genome Center at

the Brigham and Women's Hospital, Harvard Medical School and Professor Emeritus at the University of Toronto. ChondroGene's genomics program is characterizing the gene expression of human cartilage cells across a broad



spectrum of disease stages and has developed databases containing more than 17,000 unique sequences representing individual genes. Analysis of the information in the databases led to the development of the ChondroChip™. The company is also utilizing a unique

technology in the development of a blood-based diagnostic for early osteoarthritis.

Dr. Marshall said, "We look forward to sharing our technology and expertise in partnership with the many talented CAN

researchers and clinicians across Canada. This collaboration provides a union of diverse but complementary scientific technology and clinical expertise that will hasten the realization of a world in which the pain and disability of arthritis is effectively alleviated." ■

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## MRI techniques

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tablet and an interactive touch-sensitive screen. She is planning to submit an article (technical note) for publication reporting the results of the tool comparison.

In addition to learning the process of quantitative cartilage morphology analysis, Ms. McWalter participated in the development of custom software with Dr. Eckstein's group. Dr. Eckstein is also an imaging specialist and provided her with a lot of insight into the technical changes occurring in MRI imaging. Most research using MRI is currently done with a 1.5 T magnet but there is a move now to a 3 T magnet. Currently it can take up to 15 minutes to complete a scan and the patient has to remain still

for that time. People with knee problems may also have stiffness in their hips and have difficulty staying in one position for long periods of time. The use of the larger magnet can shorten the scan time and has the potential to produce a clearer image.

The placement offered Ms. McWalter an opportunity to make contact and network with international scientists. She attended a conference with Dr. Eckstein held by the European Society for Engineering and Medicine in Halle, Germany and the World Congress on Osteoarthritis held by the Osteoarthritis Research Society International (OARSI) in Berlin.

Ms. McWalter said, "The experience was very positive. Everyone was friendly, welcoming and happy to have me from the first day. I worked with medical

students, computer scientists and other engineers – a very well-rounded interdisciplinary group. Not everyone does things in the same way. An exchange placement makes you think more about your own work. You come back to what you are doing and see things differently. It is very helpful." She is considering a PhD after she obtains her Master's degree this year, inspired by her exposure to Dr. Eckstein's work and enthusiasm for research and wants to continue her work with knee joints and possibly knee replacement surgery.

The skills Ms. McWalter acquired in Germany are being shared with colleagues in Dr. Wilson's laboratory. The method they use focuses on bone. She says, "The cartilage method brings an extra component we need into the mix."

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Dr. Wilson also commented on the positive outcome of the exchange, "Many research techniques can't be learned by reading an article- you have to be in the lab to learn the tricks of the trade that are essential to getting usable results. Emily has brought back important new skills, a much deeper knowledge of the field and a valuable new perspective on her project. She will train our other students and research assistants in the techniques that she learned in Munich so that we can establish these capabilities permanently in our lab."

Dr. Eckstein also spoke of the success of the exchange, "We very much enjoyed that Emily was able to join our musculoskeletal research lab in Munich. I hope that Emily also profited from seeing Germany a little, given the many hours she spent in the lab. Emily's stay was also very educational for us, as everyone in the lab learned a great deal on the research going on in her lab, about proper use of scientific English, and, most importantly, what wonderful people Canadian Master's students are."



Left to right: Emily McWalter, Michael Paice, Agnes d'Entremont, Derek Wilson, Dr. David Wilson

The exchange program is continuing and the Network hopes to expand it this year. Dr. Beier said, "We initiated the exchange program with the German arthritis community to foster interactions between Canadian and German arthritis researchers. Emily was our first exchange student and we are delighted that her time in Germany was so successful - this is proof that the exchange program delivers on its objectives. The call for applications for the summer and fall of 2004 should be distributed shortly by the Network." ■

## 21st century sleuths

*The fictional 19th century detective Sherlock Holmes used a magnifying glass and his intellect to track down culprits and solve crimes.*

SCIENTISTS OF THE 21<sup>ST</sup> CENTURY use a more advanced magnifying glass, modern laboratory instruments and their intellect to find the culprits that cause disease. At Université Laval a number of Network members working in the Immunology and Rheumatology group of the Centre hospitalier de l'Université Laval (CHUL) of the Centre hospitalier universitaire de Québec (CHUQ) are actively engaged in research on the causes of arthritis and how to stop it from destroying the joints and causing pain and disability. The stories of five of the researchers follow, showing diverse approaches to unravelling the mysteries of the disease.

### DR. WALID MOURAD

While working as a postdoctoral fellow at Harvard University in Boston, Dr. Walid Mourad began to follow the trail of MHC class II

molecules and their role in the pathology of autoimmune disease, particularly arthritis. In 1990 he returned to Canada and established his career in arthritis research at Université Laval, where he had obtained his Master's degree and PhD in microbiology and immunology.

Dr. Mourad is investigating the role of MHC class II molecules, to see whether their signalling is involved in the development of arthritis. If these molecules alone can induce arthritis, it may be possible to block the signal and stop the disease. People with arthritis have antibodies to these MHC class II molecules so he believes they are present at a certain stage of the disease. His work is also focused on defining a novel receptor involved in the development of inflammatory disease by interacting with the CD40 ligand molecule, which causes



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inflammatory cytokine production. The novel receptor has been characterized and Dr. Mourad is investigating how it interacts with ligands. Once this is known, it will be possible to generate peptides to block the interaction.

Network membership has changed Dr. Mourad's view of research. He said, "It took me a year to adopt the Network's culture of value-driven research and a collaborative, transdisciplinary approach. The involvement of consumers puts a human face on the disease and reminds me that I am working on something that will help people. It is not just an abstract puzzle I am solving. I am convinced it is the best way to work." He is organizing a conference on B cells and autoimmune disease hosted at Université Laval July 15-18, 2004. It will bring together 300 international scientists to discuss their recent discoveries in autoimmune disease. For more information, please visit the Web site at [www.scba2004.org](http://www.scba2004.org)

### DR. MARIA FERNANDES

Dr. Maria Fernandes is looking for proteins that are culprits in the pathogenesis of rheumatoid arthritis (RA) and for therapeutic targets for the disease.

Dr. Fernandes obtained a PhD from McGill University in inherited disorders. An interest in cancer led her to a postdoctoral fellowship at Thomas Jefferson University in Philadelphia where she worked on chronic myelogenous leukemia and identified novel proteins that have a potential role in the development of this cancer. These proteins are involved in the immune system so she pursued her work in a second postdoctoral fellowship with Network member Dr. Paul Naccache of the Immunology



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and Rheumatology group at Université Laval. Exposure to research in inflammation led to her interest in angiogenesis and RA.

Currently, Dr. Fernandes is working on the motin family of proteins, trying to discover whether they cause angiogenesis in RA and, if they do, how to target them. As a CAN scholar, she has collaborated with other Network members, which has furthered her research. For example, she obtained synovial cells and control samples from Network member Dr. John Di Battista of the McGill University Health Centre. Dr. Fernandes also collaborates with other CAN investigators in the group. She says, “We have a very interactive environment here. We are the largest research group in Canada working together in the same place on inflammation. Each one has their expertise and being able to speak so easily to people with different expertise helps.”

Dr. Fernandes values the CAN scholarship “which is facilitating the beginning of my career by supporting me as a young investigator. The experience of working with a network is very enriching, especially in terms of collaborations and the ability to talk science with Canadian scientists in small meetings.”

Another benefit of Network membership for Dr. Fernandes has been assistance with knowledge exchange. Dr. Fernandes said, “If I find something interesting, CAN ensures this finding goes beyond the borders of my laboratory environment so it can benefit others in academia and consumers. As young investigators, we are not always aware of all the steps to be taken.”

#### **DR. PIERRE BORGEAT**

An exciting discovery in Sweden changed the direction of Dr. Pierre Borgeat's career. As a post-doctoral fellow at the Karolinska Institute, working with Nobel laureate (1982) Dr. Bengt Samuelsson, he discovered a new family of mediators



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of inflammation in 1976 and he has conducted inflammation research in this area since then. A Network member, he is now the director of the Immunology and Rheumatology group.

Dr. Borgeat returned to Université Laval, where he had received his PhD under the supervision of Dr. Fernand Labrie, to investigate the mechanism of leukotriene biosynthesis, the role of lipid mediators in inflammation and inflammatory diseases and to look at the mechanism of action of anti-inflammatory drugs. He has built a strong group by recruiting young investigators, a number of whom are Network members. There are now 94 people in the group and they are quickly outgrowing their lab space.

A lot of research has been done on finding the mechanism that triggers inflammation but Dr. Borgeat believes it is also important to know what dampens the process as it can lead to the design of a new approach to treatment. One of his projects is addressing the mechanism of regulation of leukotrienes and platelet-activating factor, to understand the natural mechanism of down regulation of lipid mediators of inflammation and how important they are in the suppression of inflammation.

Another aspect of Dr. Borgeat's work is the project that is investigating how leukotrienes are produced in the body. Enzymes that produce leukotrienes have been characterized and cloned in several laboratories but the regulatory interaction of these proteins implicated in leukotriene biosynthesis is unknown. Of particular interest is the mechanism that controls the association at the same site of three different proteins involved in the production of leukotrienes.

Methotrexate is a drug frequently prescribed for adult rheumatoid arthritis. It is effective but its mechanism of action is unknown and controversial. Dr. Borgeat is investigating how this drug works, searching for clues that would lead to the development of better drugs for arthritis.

Dr. Borgeat is also investigating the hypothesis that several lipid mediators regulate neutrophil trafficking to inflammatory sites, which is a key process in the development of inflammation. The results of his work could lead to a new

therapeutic approach to managing inflammation.

All of these avenues are tantalizing, offering the promise of new treatments for a painful, debilitating disease. A dedicated scientist, Dr. Borgeat works like a detective, discovering clues, following leads, tracking down the microscopic culprits that cause arthritis.

#### **DR. MARC POULIOT**

Is it possible that taking medication over a long period of time to ease the pain of arthritis could make the arthritis worse?

Network member

Dr. Marc Pouliot believes some medications used for pain relief hasten joint destruction because they fail to inhibit cells of the immune system responsible for tissue destruction in arthritis. Dr. Pouliot has observed that cyclic AMP (cAMP) has an anti-inflammatory effect on in these cells so he is searching for new ways to increase cAMP levels, in an attempt to slow down the process of joint destruction.

Dr. Pouliot has been working on neutrophils –white blood cells, which migrate to the arthritic joint and may cause extensive tissue damage – since graduation. He received his PhD in Cellular & Molecular Biology from Laval Université in 1994, then did his postdoctoral training at the Royal Adelaide Hospital in Australia and the Brigham & Women's Hospital in Boston where he pursued his research on the implication of white blood cells in auto-immune diseases such as arthritis. He is currently a principal investigator in the Immunology and Rheumatology group. He and his research group are focusing on identifying and activating endogenous pathways, which contribute to resolve inflammation, the increase of cAMP being a promising approach.

Dr. Pouliot credits the Network with advancing his work by funding him as a Network scholar and by making it possible for him to meet the leading Canadian arthritis researchers in such an efficient way. He was also exposed



to pharmaceutical and biotechnology companies at Network events, which made him aware of the needs of industry. Most important is the involvement of consumers in the Network. He says, "I want my research to be relevant to people's health. Through CAN I receive a lot of suggestions, comments and feedback from consumers and that provides a reality check for us."

#### DR. FAWZI AOUDJIT

Inflammation in an arthritic joint causes bone loss and pain and Dr. Fawzi Aoudjit is trying to find out how to stop it.

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Dr. Aoudjit was attracted to Université Laval because of his interest in inflammatory mechanisms and because he believes one of the best groups of researchers he could collaborate with is working in the Immunology and Rheumatology group. A Network scholarship enabled him to obtain a position at the university and launch his career as an investigator. He teaches a course on autoimmunity and apoptosis and although he is a young researcher, he is already providing training to two graduate students and one postdoctoral fellow on his team, encouraging them to make their careers in arthritis research.

After obtaining a Master's degree at the Université de Sherbrooke in immunology, Dr. Aoudjit studied the regulation of ICAM-1; an adhesion molecule expressed on endothelial cells and involved in leukocyte recruitment to inflammatory sites, for his PhD in physiology and endocrinology from Université Laval. During his postdoctoral work at the Armand Frappier Institute with Network member Dr. Yves St-Pierre, he investigated the role of LFA-1/ICAM-1 interaction and metalloproteinases in lymphoma dissemination and invasion. At the Burnham Institute in San Diego, with Dr. Kristiina Vuori, he studied the regulation of apoptosis by extracellular-matrix proteins, which under certain conditions protect normal cells from apoptosis.

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## Dr. Ken Pritzker

*Laboratory medicine and pathology are critically valuable disciplines in the search for disease mechanisms that are microscopic in size, complex and reluctant to yield their secrets.*

NETWORK MEMBER, DR. KEN Pritzker, who is the Pathologist-in-Chief and Director of the Department of Pathology and Laboratory Medicine at Mount Sinai Hospital and Professor of Laboratory Medicine and Pathobiology at the University of Toronto, has devoted his research career to finding the biologic processes that cause arthritis.

While he was a resident, Dr. Pritzker was encouraged by Dr. David Kahn at McGill University to explore the pathology of arthritis and connective tissue, an area where little was known at the time. He began to work as a pathologist at Mount Sinai Hospital, University of Toronto and started his research with an investigation of inter-vertebral disc degeneration. Dr. Allan Gross, an orthopaedic surgeon, joined the hospital staff and began to do joint transplants and Dr. Pritzker started to assess graft survival including transplanted cartilage cells survival. At the time, most investigators worked alone and multidisciplinary research groups were few. With the assistance of funding from The Arthritis Society and with the encouragement of rheumatologist, Dr. Joseph Houpt, Dr. Pritzker and Dr. Stan Nyberg, Professor of Chemistry at the University of Toronto, formed the Connective Tissue Research Group to pursue research on degenerative arthritis. Dr. Petros Cheng, a chemist specializing in biomineralization, was recruited as the first full-time scientist as well as Dr. Mark Adams as a fellow.

The Connective Tissue Research Group was successful in its work and attracted others such as Network members, Drs. Marc Grynbas, Graeme Hunter, Rita Kandel and Howard Tenenbaum, now Associate Dean, Biological and Diagnostic Sciences, Dentistry, University of Toronto. The group was multi-disciplinary and included Dr. Pritzker's first graduate student, Richard Renlund, a veterinarian. Dr.



Dr. Ken Pritzker and Pauline So

Tony Cruz, a young scientist joined the group in 1987 and having learned the value of doing research with a multi-disciplinary group, went on to become one of the founders of the Network.

Dr. Pritzker's current research on osteoarthritis involves working with the Osteoarthritis Research Society International to develop a better way to assess the disease. He has also created a strategic laboratory resource in arthritis histology that will make the expertise he has developed for pre-clinical and clinical trials available to Network members and to the arthritis research community as a strategic resource in histology.

Together with Prof. Ernst Hunziker and Dr. Pierre Mainil-Varlet of Berne, Switzerland, Dr. Pritzker founded a company, Allevia, based in Canada and Switzerland, that provides pre-clinical services to pharmaceutical and biotechnology companies for research on bone and joint, arthritis and orthopaedic biomaterials. The company can perform surgeries to induce experimental models, assess pathologies and add other assessments as required.

Dr. Pritzker's two careers have progressed in parallel. In addition to conducting research in osteoarthritis, biomineralized tissue and calcium pyrophosphate crystal arthritis (pseudogout), he is in his fourth term as chief pathologist and has developed an academic department with over 25 faculty members, conducting research in arthritis, cancer, genetics and other areas. ■

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# When that eureka moment strikes — call us

*To all CAN members: When that wonderful moment arrives and you realize that you have made a scientific discovery related to arthritis that has commercial potential, what do you do after shouting “eureka”?*



Dr. Tineke Meijers

ARCHIMEDES RAN NAKED through the streets of Syracuse more than 2000 years ago, shouting “eureka” after making his scientific discovery, which we now know as the Archimedes Principle. Whether or not they wish to run naked through the streets, Network members should seek advice on knowledge exploitation from Dr. Tineke Meijers, CAN’s executive director, research and development.

The Network has processes in place to manage and facilitate the identification and commercialization of arthritis-related technologies. Some members disclose the invention to the Network and sometimes Network staff identify potential opportunity, for example, while reviewing a draft manuscript for publication. Disclosure is made simultaneously to the member’s institution and the Network works with the industry liaison office of the member’s institution to move the technology forward in a timely fashion.

CAN conducts a patent search to determine whether there is any prior art (patents, applications for patents open to public inspections, publications that have a bearing on the patentability of any claim in a patent application), or if the technology has been disclosed. Intellectual property ranges from copyright, e.g., for a quality of life questionnaire, to potential new targets for therapeutic intervention, diagnostics and devices. The Network retains external consultants to provide advice on whether an opportunity exists, whether the invention can be patented, and the

commercial potential.

The Network supports proof of principle research and assists members in identifying other sources of funding, such as a proof of principle grant from the Canadian Institutes of Health Research.

Once an invention has been disclosed to the Network, a non-confidential description of the discovery is written for use in discussions with potential partners in industry. CAN has a broad network of contacts in industry and has insights into what intellectual property pharmaceutical and biotechnology companies are interested in. If a company expresses an interest after reading the description, CAN arranges a meeting with the inventor and the company. After the company signs a confidentiality agreement, a presentation is made by the inventor. The company at that point may decide to fund further research to strengthen the technology and may sign an option agreement to license the technology.

Dr. Tineke Meijers can be reached at 416-586-4685 or at [tmeijers@arthritisnetwork.ca](mailto:tmeijers@arthritisnetwork.ca) ■

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## National Clinical Registry in the works

THE CREATION OF THE Canadian Rheumatology Research Consortium (CRRC) in 2003, facilitated by the Canadian Arthritis Network, offers pharmaceutical companies, who want to do clinical trials in new therapies for rheumatoid arthritis, access to a network of experienced academic and community rheumatologists.

CRRC members offer expertise in

designing, evaluating and conducting clinical trials. One of the tools they will offer trial sponsors is a Clinical Trial Patient Registry. IBM has been selected to assist the CRRC in developing the technical specifications that will be used in building the Registry, which is a national, Web-enabled database containing key clinical information relevant to clinical trial recruitment. A vendor will

be selected to build and launch the database.

A prototype of the Registry will be discussed at the CRRC’s Annual General Meeting, during the Canadian Rheumatology Association’s Annual Meeting. For further information about the Registry, please contact John Riley, at 416-586-3167 or [jriley@arthritisnetwork.ca](mailto:jriley@arthritisnetwork.ca) ■

# \$4.5 million awarded for osteoarthritis research

*Three grants totalling \$4.5 million, co-funded by the Canadian Arthritis Network (CAN) and the Institute of Musculoskeletal Health and Arthritis (IMHA), were awarded for osteoarthritis (OA) research through the Canadian Institutes of Health Research's New Emerging Team (NET) Grants program.*

THE NET GRANTS, ALLOCATED through a peer-review process, were designed to support the creation and development of new health research teams that will lay the foundation for future successes in Canadian research.



Dr. John Esdaile

Dr. John Esdaile of the Arthritis Research Centre of Canada in Vancouver will receive \$1.5 million to develop tools to detect OA at an earlier stage than it is currently diagnosed. This will make early intervention possible, which limits the consequences of the disease. The research team includes experts in diagnostic blood tests for OA, state-of-the-art X-ray scanners, treatment of OA and measurement of important aspects of the disease such as limitations on activities, costs, and psychological consequences.

Dr. Gillian Hawker of Sunnybrook and Women's College Health Sciences Centre in Toronto will receive \$1.5 million to look at the determinants and consequences of pain and fatigue in OA using a biopsychosocial approach. A multidisciplinary team of health researchers will explore the relationship

of pain, fatigue, sleep and mental health in OA in relation to factors such as coping strategies, family support and the use of established treatments. The results will enable the development of new treatments, targeted to individuals in the context of their families and the community as a whole.

Dr. James Henry of the University of Western Ontario in London will receive \$1.5 million to look at the molecular mechanisms of pain and fatigue in OA in the nervous system and joints. The research will identify the chemicals that are altered in and around the joint at different stages of OA, which may generate the pain. The project will also determine the effects of chemicals released by peripheral nerve terminals

**"CONSUMERS IDENTIFIED research on the causes of pain and fatigue as their first priority. We are pleased to see that substantial progress will be made in this area with the NET grants."**



Dr. Gillian Hawker



Dr. James Henry

on joint tissues. This work will help identify new targets to alleviate pain and prevent tissue destruction in OA.

In 2002, stakeholders in OA, including CAN, IMHA, The Arthritis Society, arthritis researchers, trainees, allied health professionals, national and international pharmaceutical and biotechnology companies, and consumers, held a consensus conference, which defined future directions for OA research. In response to the outcome of the conference, CAN and IMHA agreed to fund the NET grants. On November 15, Dr. Cy Frank, scientific director of IMHA, announced the award of the grants at CAN's 2003 Annual Scientific Conference.

Dr. Robin Poole, CAN's scientific co-director said, "The Canadian Arthritis Network is unique in involving consumers in making decisions about the future directions of arthritis research. At the consensus conference on OA last year, consumers identified research on the causes of pain and fatigue as their first priority. We are pleased to see that substantial progress will be made in this area with the NET grants." ■

# Appointments to CAN's board of directors

**BOARD MEMBER DR. ROBIN Armstrong** was appointed Chair of the Network's Board of Directors at a meeting held in November. Dr. Armstrong is currently a Professor Emeritus at the University of Toronto. He is a past President of the University of New Brunswick and is a former Dean of the Faculty of Arts and Science at the University of Toronto. He was a member of the Natural Science and Engineering Research Council of Canada and a founding Director of the Canadian Institute for Advanced Research. He was appointed to CAN's Board of Directors in August 2003.

Dr. Ivan Otterness was appointed to CAN's Board of Directors in November. Dr. Otterness, currently a consultant, was a research scientist with Pfizer Inc., where he conducted studies on inflammation to develop drugs for arthritis. He was successively a Project Leader, Principal Research Investigator and Research Advisor. Upon retirement



Dr. Robin Armstrong Dr. Ivan Otterness

from a 29-year career with Pfizer, Dr. Otterness was appointed Visiting Professor in the Department of Pharmacology, University of Erlangen, Germany, where he lectured on the pharmacology of pain. He was subsequently appointed Visiting Scientist in the Arthritis Division, TNO Prevention and Health, Leiden, The Netherlands, where he lectured on collagen metabolism in osteoarthritis. He received the Distinguished Scientific Mentor Prize from the International Association of Inflammation Societies (IAIS) in 2003. ■

## 21st Century Sleuths

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Growing evidence indicates that resistance to cell death (apoptosis) contributes to inflammatory diseases and cancer. The body normally gets rid of harmful cells by activating apoptosis, but in arthritis, this does not happen so the cells accumulate in the joint and the result is inflammation.

Dr. Aoudjit is now searching for the mechanism that makes cells resistant to apoptosis. His work at the Burnham Institute showed that interaction of integrin  $\alpha 2\beta 1$ , which binds to collagen

type I, protects T lymphocytes from apoptosis. Interestingly, T lymphocytes that accumulate in arthritic joints of patients with rheumatoid arthritis have an increased expression of  $\alpha 2\beta 1$ . He received a Network scholarship to work on the mechanisms by which this integrin modulates T cell apoptosis and its implication in the development of inflammation.

Dr. Aoudjit recently published his finding that the MAPK/ERK pathway is one of the main pathways activated by integrin  $\alpha 2\beta 1$  responsible for the resistance of T lymphocytes towards apoptosis. He is now investigating how the pathway is activated by  $\alpha 2\beta 1$  integrin.

Dr. Aoudjit collaborates with a number of CAN members, both at his institution and across Canada. He says, "I learn a lot at each Network meeting. Arthritis is a complicated disease and the Network, with excellent scientists at all levels, both in basic and clinical research, helps young scientists learn and advance knowledge." ■



CANADIAN ARTHRITIS NETWORK | LE RÉSEAU CANADIEN DE L'ARTHRITE

The Canadian Arthritis Network is the gateway to arthritis R&D in Canada, a single point of contact linking researchers, clinicians, academia, The Arthritis Society, the Institute of Musculoskeletal Health and Arthritis of the Canadian Institutes of Health Research, pharmaceutical and biotechnology companies, and government. In addition to funding research, the Network helps scientists bring their discoveries to market by facilitating technology transfer and commercialization of new arthritis products. The Network is a not-for-profit organization funded by the Government of Canada's Networks of Centres of Excellence.

Chris Nelson  
President

Jane Aubin, PhD  
Scientific Co-Director

Robin Poole, PhD, D.Sc.  
Scientific Co-Director

Canadian Arthritis Network  
250 Dundas Street West  
Suite 402

Toronto, Ontario

Canada M5T 2Z5

Tel: 416-586-4770

Fax: 416-586-8395

E-mail: [can@arthritisnetwork.ca](mailto:can@arthritisnetwork.ca)

[www.arthritisnetwork.ca](http://www.arthritisnetwork.ca)



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