



## Helping bad knees get a break: Implantable polymer that helps cartilage regenerate

*Regenerating damaged parts of our bodies may seem like the stuff of science fiction. Nevertheless, an implantable gel — created by bio-engineer and Canadian Arthritis Network (CAN) Investigator, **Mike Buschmann**, and his team of researchers — may do just that.*

HE WAS THE STAR OF HIS football team 30 years ago. Today, a knee that took one too many hits is making it difficult for this otherwise healthy and athletic 50-year-old to be as active as he would like.

The culprit in this case is damaged cartilage. Joint disorders resulting from damaged cartilage, including worn out knees and hips, will account for a significant portion of the one in five Canadians who will be diagnosed with arthritis in the next 20 years. This is in addition to the four million Canadians who currently suffer from the disease.

Joint replacement surgery is one option. However, many sufferers, like the football player, are considered too young to undergo the procedure and wait times can be long.

Fortunately, there may soon be a new option. **Dr. Mike Buschmann**, of École



Drs. Caroline Hoemann and Michael Buschmann

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Polytechnique de Montréal, is an expert in cell and biomaterials-based cartilage repair and the assessment of cartilage functional (mechanical) properties *in vitro* and *in vivo*. He leads a team of researchers, which includes CAN Investigators **Drs. Caroline Hoemann**, also of École Polytechnique, **Mark Hurtig** of Guelph University and **Marc McKee** from McGill University, and corporate partner, BioSyntech Canada, that has developed a unique polymer formulation. When this is combined

with the patient's own blood, it can be implanted into an area of cartilage damage to stimulate growth and repair of cartilage. The polymer/blood mixture — BST-CarGel® — has unique properties: it sticks to bone and cartilage and solidifies as a stable clot; there it works like a scaffold to help the cartilage rebuild.

A prospective randomized clinical trial, approved in the fall of 2005 by Health Canada, is being carried out by BST-CarGel® manufacturer BioSyntech,

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## Helping bad knees

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a biomedical company located in Laval, Quebec. This medical device shows tremendous promise for completely repairing damaged cartilage.

Currently, many surgeons are carrying out “microfracture” (or bone marrow stimulation) procedures that can stimulate a wound–repair response. While this procedure has had some success, results are inconsistent. The concern is about the quality of the tissue generated.

Tests on large animals showed that when BST-CarGel® was added to the microfracture procedure, the quantity and quality of generated tissue improved. The researchers expect that this higher-quality tissue will result in reduced pain and increased mobility for the patient.

The trial, which consists of 80 patients, is currently underway in multiple clinical centres across Canada including Halifax, Quebec City, Montreal, Toronto, Hamilton, London, Winnipeg, Calgary and Vancouver, as well as one European site in Madrid, Spain. All sites are actively recruiting subjects.

One half of the participants are undergoing the microfracture procedure only, while the other half will undergo the same procedure plus the implantation of BST-CarGel® using minimally invasive surgery. A state-of-the-art MRI technique will analyze the amount of regenerated tissue and the quality of that tissue as endpoints. Other endpoints will include clinical outcomes such as knee-related pain and function.

Following the surgery, each subject will be monitored closely and will adhere to a standardized physiotherapy regimen. Tissue regeneration is an inherently slow process, so it is expected to continue in each patient for 12 months or more. In fact, Dr. Buschmann says, “The expected course is that there should be continued improvement for several years.” For the purposes of the trial, outcomes will be measured at 12 months post-procedure for each subject.

BioSyntech, which specializes in designing and manufacturing biomaterials for regenerative medicine and therapeutic delivery, will apply for market approval for BST-CarGel® once

## Networking discoveries



Cartilage repair in adult sheep 6 months after treatment with BST-CarGel®. A Safranin-O/Alizarin Red stained section revealed relatively mature articular cartilage containing superficial (SZ) transitional (TZ) and radial (RZ) zones with a re-established tidemark (TM) above an actively remodeling bone bed (Hoemann *et al.*, *Journal of Bone and Joint Surgery*, 87:2671-2686, 2005)

THE INITIAL DISCOVERY of this particular formulation of the polymer was in 1997, one year prior to CAN’s creation in 1998. “The timing was perfect,” explains **Dr. Mike Buschmann**. “We had finished *in vitro* studies by the time the Network was created. Through CAN and **Dr. Robin Poole**, who was then Associate Scientific Director, we developed the connections needed to take the project further. We worked very closely with **Dr. Mark Hurtig**, at the University of Guelph, in order to complete our preclinical animal studies, while **Dr. Marc McKee** at McGill University helped us to interpret the effects of our gel on subchondral bone. The Network was close to essential in those early days.” In addition to making connections with people whose expertise could further the project, CAN also provided grants to support aspects of the work.

the trial has been successfully completed.

Researchers already have some idea what to expect, based on data from a series of procedures completed on 33 patients up to three years ago. Although not a clinical trial, Health Canada approved the treatment on a case-by-case basis through their Special Access Programme for Medical Devices. These patients reported significantly reduced pain and stiffness, and increased mobility,

12 months after undergoing the BST-CarGel® procedure. However, it is important to note that there was no control group.

Given these positive signs, the medical device could be available in the next few years. So, maybe the football player can look forward to getting back to the active life he wants. But perhaps he should choose an activity that doesn’t involve tackling. ■

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# CAN welcomes Dr. John Esdaile as its new Scientific Director and CEO

*John Esdaile, MD, MPH, FRCPC, has been active with the Canadian Arthritis Network since its inception and has made meaningful contributions to the organization through his leadership, research and committee work.*



HIS VISIONARY AND LEADERSHIP qualities at CAN, and his role in creating the Arthritis Research Centre of Canada (ARC), have demonstrated that Dr. Esdaile is an innovative, strategic thinker who is deeply committed to arthritis research. In 2005, Dr. Esdaile was recognized for his research contributions by his peers when he received the Distinguished Investigator Award from the Canadian Rheumatology Association and in 2006 he was named a Kirkland Scholar in the U.S.

“John Esdaile was a natural choice to lead CAN,” explains **Dr. Robin Armstrong**, Chair of the Canadian Arthritis Network’s Board of Directors. “He is a strong leader who has consis-

tently demonstrated his commitment and dedication to the success of CAN. He is an excellent choice.”

Dr. Esdaile currently divides his time between ARC, teaching at the University of British Columbia (UBC) and conducting research into arthritis.

Dr. Esdaile has authored more than 150 publications in refereed journals, as well as more than two dozen publications, books and book chapters. He is recognized for his publication of the efficacy of hydroxychloroquine in systemic lupus erythematosus and his work has altered the treatment of this disease for many patients. Osteoarthritis and rheumatoid arthritis round out his areas of research interest. ■

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## Message from Dr. John Esdaile, Scientific Director and CEO

TEN YEARS AGO, a small group of arthritis researchers, including **Drs. Tony Cruz, Cy Frank, Jeff Dixon and Robin Poole**, thought the unthinkable: that the arthritis community and its key partners could compete for a national Network and win.

With enthusiastic support and assistance from The Arthritis Society of Canada’s president at the time, **Denis Morrice**, and vice-president (research), **Bonnie Thorn**, and a commitment of \$10,000, a meeting was held to write a letter of intent on a tight deadline.

Scores of scientists would draft the final full application. Tony Cruz provided the arthritis community with the leadership and business experience essential to a successful Network of Centres of Excellence application. Roughly a full year later the unthinkable was realized: The Canadian Arthritis Network (CAN) received its first of two cycles of funding from the federal government.

CAN has always been about thinking the unthinkable.

CAN expanded the arthritis community to include any scientist or trainee who wanted to tackle arthritis. Jeff Dixon’s leadership in promoting training has paid huge dividends for Canada. Robin Poole’s insistence that CAN must include the broadest possible spectrum of scientists – from those studying

stem cells, genetics and biomedical implants to those involved in education, biostatistics and health services research – has resulted in a Network that is the envy of arthritis scientists around the world.

CAN committed to involving people with arthritis (“consumers”) in every aspect of the organization and Cheryl Koehn led the founding of the CAN Consumer Advisory Council, a consumer network that remains unparalleled in the world. CAN members have altered the face of Canadian arthritis research forever.

While CAN has lost the determined leadership of **Dr. Jane Aubin** – the new Scientific Director of the Canadian Institutes of Health Research’s Institute of Musculoskeletal Health and Arthritis – she will remain active as a CAN Investigator.

Following such luminary scientific directors as Tony Cruz, Robin Poole and Jane Aubin is both exciting and terrifying. But, my good fortune is the quality and commitment of all the Network Investigators, the CAN Consumer Advisory Council and their allied members, the CAN administrative staff, and the many volunteers on the Board and CAN committees.

Together we face the challenge of determining how best to sustain the huge benefits that CAN has brought to the arthritis community, and Canada, when Network funding ends in 2012. ■

Dr. John Esdaile  
Scientific Director and CEO

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# Bouquets and more bouquets – Positive reviews for CAN’s 6<sup>th</sup> Annual Scientific Conference

*It appears that the secret to holding a successful scientific conference is the inverse of what common sense suggests: instead of warm and tropical for your location, choose a cold locale (Winnipeg, Manitoba) and hold your event during the winter (November 30 to December 2, 2006). Of course, having exceptional speakers, enlightening topics and many opportunities to network also helps to attract delegates.*

AS WAS DONE LAST YEAR, four attendees to CAN’s 6<sup>th</sup> Annual Scientific Conference were asked to provide their viewpoint of what worked and what did not at this year’s event.

## **Consumer perspective**

**Corrie Billedeau**, a leader with Patient Partners and the Canadian Arthritis Patient Alliance and an allied member of CAN’s Consumer Advisory Council, has attended three CAN conferences and says she enjoyed this one the most.

“I definitely understood more of the sessions than before...I think the reason this conference stands out is because of the logical way the sessions were set up. The consumers [first present their] perspective about their needs, then the researchers follow with what was being done to address the problem,” says Ms. Billedeau. She continues on to say: “suggestions for the future from a consumer would be to follow this format.”

She also shared that some consumer colleagues also felt this conference was superior to previous ones due to the successful format (consumer + scientist/ researcher + industry). As a poster judge, Ms. Billedeau recommends holding the poster judging when, or where, there are no external distractions to detract from the event.

## **Industry perspective**

A regular attendee of CAN conferences and workshops since 2002, **Dr. Sanjay Kumar**, of GlaxoSmithKline in Collegeville, Pennsylvania, calls himself a CAN “admirer” who enjoyed the last Conference.

Some highlights for Dr. Kumar included the opportunity to hear from, and inter-

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**Corrie Billedeau**, Consumer

“Of several scientific societies and organizations, CAN is very unique in its desire to have sufficient industry representation. In my opinion, this makes the CAN meeting extremely useful and much better in terms of information exchange, networking and translational research that we covet so much.”

**Dr. Sanjay Kumar**, Industry

“The Network continues to fulfill its mandate and has become a really unique resource. [...] I would certainly encourage any CAN member who has not been attending to consider coming out to the meeting in 2007.”

**Dr. Brian Feldman**, Investigator

act with, consumers first-hand, meeting and hearing the “excellent” presentations of trainees and being educated by many of the keynote presenters.

Dr. Kumar was particularly impressed by the inclusion of industry presentations. “Of several scientific societies and organizations, CAN is very unique in its desire to have sufficient industry representation. In my opinion, this makes the CAN meeting extremely useful and much better in terms of information exchange, networking and translational research that we covet so much.”

His suggestion for improvement would be to set aside more unstructured time for networking.

## **Guest perspective**

**Meagan Hasek-Watt** was invited to offer her perspective as a consumer and a student researcher from Dalhousie University. She was attending CAN’s Annual Scientific Conference for the first time.

Overall, Ms. Hasek-Watt feels “the organizing committee did a wonderful job in accommodating everyone’s needs and bringing together such a wide range of professionals, consumers and trainees. The presentations and the scope of discussion were absolutely fascinating to me, at least for the most part (as a qualitative and social sciences researcher).”

Some key experiences for Ms. Hasek-Watt were the inclusion of “Aboriginal

culture and heritage prior to the [symposium] on the high incidence of arthritis amongst Aboriginal Peoples,” the chance to receive career advice from a leading arthritis researcher at the Mentorship Breakfast and she also appreciated the opportunity to present her Masters research project during the poster session and enjoyed networking with trainees and established researchers.

Her advice to improve future conferences would be to shorten the scheduled programming and provide more breaks as it becomes difficult for people with arthritis to sit still on hard chairs for long periods of time. Even delegates without arthritis probably support those recommendations.

### Investigator perspective

**Brian Feldman** is a Paediatric Rheumatologist with The Hospital for Sick Children in Toronto. He strongly supports CAN's Annual Scientific Conference because of the valuable outcomes that have resulted from past meetings.

Dr. Feldman believes that the networking that takes place at CAN meetings has helped advance the Canadian childhood arthritis agenda in the following five ways: “forging collaborations; broadening exposure to other scientists; helping to link with industry partners; helping to link with consumers; and, providing opportunities to interact with trainees from across the country.” Dr. Feldman credits a CAN-funded meeting in Calgary, in 2002, with the advancements taking place today in the area of childhood arthritis research.

Echoing some of the comments made by Ms. Hasek-Watt, Dr. Feldman is enthusiastic about the mentorship opportunities available to trainees at the CAN Conference. He states, “One of my PhD students is considering a radical change in career direction following the CAN meeting!”

He concludes by saying that he is a big “CAN fan” and he believes “the Network continues to fulfill its mandate and has become a really unique resource. [...] I would certainly encourage any CAN member who has not been attending to consider coming out to the meeting in 2007.”

We could not have said it better ourselves. ■

## Special Workshops

Trainees and those interested in the fields of bioengineering and joint restoration will be pleased to learn that CAN is planning two workshops to be held prior to the 7th Annual Scientific Conference next October in Halifax, Nova Scotia.

On Thursday, October 11, a day-long **Trainee Workshop** will offer networking opportunities and feature interactive sessions led by guest speakers and Network experts and covering topics essential to young researchers embarking on their careers.

To build on the momentum already generated by the 2006 Workshop on Bioengineering for the Restoration of Joint Function (BIO RJF), the **2007 BIO RJF Partnering Workshop** being planned for October 11th is intended to identify potential areas of collaboration between investigators and industry.

See you there!



### Canadian Arthritis Network 2007 Annual Scientific Conference

October 11 – 13, 2007  
Halifax Marriott Harbourfront  
Halifax, Nova Scotia

Please join and workshop  
session topics include:

The latest advances in CAN's  
Strategic Research Initiatives

- Reengineering for the  
Restoration of Joint Function
- Inflammatory Joint Diseases
- Osteoarthritis

Innovations in CAN's Strategic  
Research Resources

- Pre-clinical models of arthritis
- Inducibles for research in  
arthritis
- Knowledge translation and  
exchange

Exciting opportunities in  
CAN's training programs

- Transdisciplinary training  
opportunities
- International exchange
- Training rotations in industry
- Mentorship/buddies

Commercialization of CAN's  
new research findings

- Translating research into  
products
- Intellectual property, patents,  
licensing and spin-offs



Member of the Network of  
Centres of Excellence

For more information about registration or sponsorship opportunities,  
please visit CAN's website at [www.arthritisnetwork.ca](http://www.arthritisnetwork.ca)

# Record attendance and enjoyment at the 6<sup>th</sup> Annual Scientific Conference

*Industry representatives, scientists, clinicians, trainees and consumers listen, learn and network at CAN's most successful Annual Scientific Conference to-date.*



Dr. Cy Frank kicks-off the conference



Christine Bergen and Dr. Jane Aubin present award to Dr. Jeff Dixon



Josh Hansen, hoopdancer, Summerbear Dance Troupe



Trainees present their posters



Trainees dine with Dr. David Wilson, UBC, and Dr. Sanjay Kumar, GSK, at networking dinner



Ms. Jay Fiddler, consumer and presenter



Dr. Jeff Reading and Dr. Robin Poole



Dr. Karl Rudolphi, sanofi-aventis



Dr. John Wilkins, University of Manitoba



Career advice from the experts

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# New Associate Director of Research and Development at CAN

*On November 6, 2006, Dawn Richards, PhD, joined the CAN administrative office as the Associate Director of Research and Development.*



IN THIS POSITION, Dr. Richards has a strong mandate to facilitate networking and collaborative efforts between various stakeholders, including Network Investigators and industry.

Dr. Richards will engage Network Investigators, attend networking events and participate in various conferences to seek out partnering ventures, drive Network progress, and create and maximize its opportunities. She will be making contact with CAN Investigators to determine how the office can help advance their research and potential commercialization prospects.

Dr. Richards received her PhD in Analytical Chemistry from the University of Alberta in 2000, and has applied her analytical toolkit and skills to a wide variety of trans-disciplinary genomics and proteomics research efforts. She has worked for two biotechnology companies in the Toronto area and her expertise

encompasses not only bench-related techniques and applications, but also includes experience with numerous Canadian granting agencies, scientific communications, project management, and networking and intellectual property-related activities. Most recently, Dr. Richards served as the project manager at the McLaughlin Centre for Molecular Medicine at the University of Toronto. Dr. Richards is motivated by a keen interest to promote science's translational potential and fully realize its numerous impacts on the general population.

Dr. Richards can be reached at [drichards@arthritisnetwork.ca](mailto:drichards@arthritisnetwork.ca) or by calling 416-586-8842. ■

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## Hot off the presses

*Two new research papers, resulting from Canadian Arthritis Network (CAN) workshops held in 2006, are now available for downloading on CAN's website ([www.arthritisnetwork.ca](http://www.arthritisnetwork.ca)).*

LAST JANUARY, CAN hosted a **Workshop on Pain and Arthritis Research**. The Workshop was planned to answer important questions about the pain of arthritis, identify unmet needs and determine priorities for future research. The Consumer White Paper that was produced following the Workshop is a summary of the most relevant ideas discussed at the meeting according to the consumers who participated. Covering the five themes that constituted the Workshop's program, the Consumer White Paper analyzes each issue and then identifies a number of key questions that require answers and could/should form the basis of future

research in arthritis pain. The insightful consumer perspective concludes with a section on how the Network can facilitate achieving the short and long term goals of future arthritis pain research. (A second White Paper, written by the planning committee, will be available soon on the website.)

The **Workshop on Bioengineering for the Restoration of Joint Function** (BIO RJF), held in June, 2006, was an important meeting to promote the development of CAN's Strategic Research Initiative (SRI) in this area. CAN Investigators, members of industry, consumers and researchers outside the Network met to identify gaps in joint

restoration research, discuss research development priorities and opportunities, and begin to build partnerships for new innovative research programs that will improve the care of people with arthritis.

The position paper (of the same name) is a twenty-page document that captures the important issues that were raised at the Workshop, identifies outcomes and future goals, and raises questions that need to be answered and can form the basis of research projects within a BIO RJF SRI to be funded by CAN. The Paper includes an appendix on current funding opportunities and another on useful sources of information relevant to the topic. ■



# Honours and awards



**Dr. Jane Aubin**, former Scientific Director and CEO of CAN, is now leading the Canadian Institutes of Health

Research's (CIHR) Institute of Musculoskeletal Health and Arthritis (IMHA) as its Scientific Director. The CAN office wishes Jane well and looks forward to maintaining its existing close relationship with IMHA.



**Dr. James Henry**, CAN Investigator and co-chair of the Workshop on Pain and Arthritis Research (held January

28-29, 2006, in Calgary), received the inaugural Dr. Raymond J. Houde Memorial Award of the Eastern Pain Society of New York for his long-term contributions to pain research and training. Congratulations Dr. Henry. ■

# New Board appointments

*Elizabeth Davidson and Susanne Robertson joined the Canadian Arthritis Network's (CAN) Board of Directors in December 2006.*



Ms. Davidson, a chartered accountant, has twenty years of experience consulting with not-for-profit organizations,

including CAN. She began her consulting practice following a career in Controllershship and Chief Financial Officer positions. Ms. Davidson has her Chartered Accountant designation and a Bachelor of Science in Psychology from the University of Toronto.



Ms. Robertson, also a chartered accountant, is the CFO/Project Manager for the new Canadian Museum for Human Rights.

She is very familiar with the arthritis world from her many years on the Board of the Manitoba Division of The Arthritis Society and is the Chair of the National Board of Directors. Ms. Robertson has a Bachelor's degree in Business Administration from the University of Manitoba. ■

# Passing the torch



**Anne Fouillard** takes over from **Jean Légaré** as the new Co-Chair of CAN's Consumer Advisory Council (CAC).

Diagnosed with primary osteoarthritis in the late nineties, Ms. Fouillard had two total hip replacements in 2002. An enthusiastic runner and long distance swimmer, Ms. Fouillard explains that exercising is more difficult now due to systemic inflammatory osteoarthritis and spondylolisthesis. Nevertheless, she is unwilling to give up and is looking for a solution through more diversified exercises.

Ms. Fouillard is a professional researcher and consultant in international development and the environment.

She also divides her time as a co-owner in a real estate firm. A long time advocate in her personal and professional life, her advocacy as it relates to arthritis has been extensive, particularly relating to access to surgery for total joint replacement. ■

A special thank you to Monsieur Légaré for his contributions and valuable work during his four-year term as a CAC member, including the three years he served as Co-Chair.



CANADIAN ARTHRITIS NETWORK | LE RÉSEAU CANADIEN DE L'ARTHRITE

**Today's arthritis research :: Tomorrow's cure**

The Canadian Arthritis Network (CAN) is funded by the Networks of Centres of Excellence program ([www.nce.gc.ca](http://www.nce.gc.ca)). CAN's vision is "a world free of arthritis" and it seeks to link Canada's leading researchers with partners who will help translate knowledge and innovations to improve the quality of life of people with arthritis, decrease the personal, societal and economic burden of the disease and promote the growth of the Canadian economy.

John Esdaile, MD, MPH, FRCPC,  
Scientific Director and CEO

Robin Poole, PhD, D.Sc.  
Scientific Director Emeritus

Johnathan Riley, MHA  
Managing Director

For matters related to *Joint Ventures*, please contact Stacey Johnson, Director of Communications, at [sjohnson@arthritisnetwork.ca](mailto:sjohnson@arthritisnetwork.ca)

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