

Quebec Pain Research Network

2014 Winter Pain Meeting Highlights

Dear Colleagues,

This year's winter pain meeting has once again demonstrated the strength of the QPRN, which has always been as a meeting point for basic and clinical researchers interested in research aimed at relieving pain. Our progress is a measure of the quality of the collaborations established through the network.

This year, directors of three important Quebec research networks were invited to present their research and activities to our members. We wish to thank **Sylvie Cossette** (Quebec Nursing Intervention Research Group), **Pierrette Gaudreau** (Quebec Network for Research on Aging) and **Eric Marsault** (Quebec Network on Drug Research) for accepting our invitation, and look forward to strengthening the links between our networks.

We were also happy to welcome once again **Jacques Laliberté**, president of the Association de la douleur chronique. He presented the important work his association does to help patients break their isolation and to bring awareness about chronic pain in the general population.

The year 2014 will be an important one for the network, as we must work together to define our objectives and orientations for the future, while continuing to build on our accumulated strengths. The infrastructures we have built, such as the Quebec Pain Registry and the Molecular Tools Platform, the great expertise our members have accumulated in both basic and clinical research, and our commitment to work together will be keys to the successful renewal of our network.

I am very proud of having been at the head of such a great network for many years. It has been a privilege and a very stimulating experience for me, but this renewal also brings about the opportunity for new leadership. I have therefore announced that I will step down from the directorship of the network this year.

Finally, I wish to thank all our members for their enthusiastic participation, and our partners and sponsors for their very important support, without which many of our accomplishments would not have been possible.

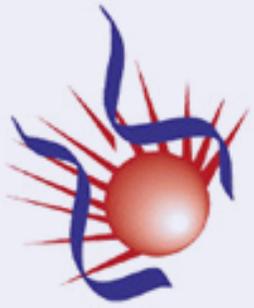
Yves De Koninck

Scientific Director - QPRN



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The QPRN: 4 more years!

Keynote Address by **Fernando Cervero**, MD, PhD, DSc

Director of the Alan Edwards Centre for Research on Pain at McGill University,
President of the International Association for the Study of Pain (IASP),
Founding member of the QPRN

Fernando Cervero has been a member of the International Association for the Study of Pain (IASP) almost since its beginnings, 40 years ago. His long-standing interest in pain research gives him a unique perspective on our field of research, and the future direction pain research, and the QPRN, will be headed in the future. He shared his vision with us this year.

Although the overall prevalence of chronic pain in the world has not changed, and although acute pain is still inadequately managed in the developing world, Dr. Cervero notes that many advances in our understanding of pain have been made over the last 40 years.

Researchers now understand that pain is a dynamic process, and that not all pains are the same. Different mechanisms operate in different forms of pain, and the same mechanism can work differently in different forms of pain.

Our understanding that all pain is in the brain, but that its reality is nonetheless undeniable, has also led to the de-stigmatization of patients suffering from pain. Diagnoses like Irritable bowel syndrome or fibromyalgia did not exist 40 years ago.

The recognition of the individuality and of the reality of pain is leading to better targeted pain treatments.

In addition to biological research, which aims to understand the brain and the mechanisms of pain, and eventually to novel analgesic drug development, Dr. Cervero says that evidence now shows that psychological and social aspects of pain must also be studied. A bio-psycho-social approach is needed to fully understand pain.

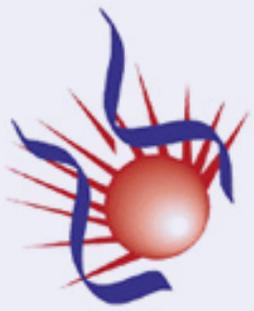
Dr. Cervero concluded his address by identifying what he views as keys to the continued success of the Quebec Pain Research Network: building on our existing strengths in basic and clinical research to address timely topics.

Such timely topics include personalized medicine, understanding the transition from acute to chronic pain, and the development of hypersensitivity of the pain pathways in the peripheral and central nervous system, and why it occurs only in a small percentage of individuals.

Dr. Cervero's insight and perspective is a source of inspiration for the upcoming renewal of our network!



Fernando Cervero



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The WPM gives our members the opportunity to present short (5 minutes) Blitz presentations, followed by lively discussion and commentary of their research. We present here short summaries of this year's presentations.

Research for better pain relief in patients

Céline Gélinas presented an important study which aims to optimize the monitoring of opioid use in hospital settings. Her initial findings were that the absence of established practical guidelines for monitoring opioid administration resulted in a monitoring that did not conform with established protocols, which could be dangerous for hospitalized patients, which constitute a vulnerable group. The project aims to improve clinical, administrative and training approaches that will lead to safer opioid administration in all Quebec hospitals.

Grisell Vargas-Schaeffer works with patients suffering from chronic pain, some of which are long-term opioid users. In response to concerns expressed by some of these patients, she undertook a study of the prevalence of alexithymia, which is an inability to understand, process or describe emotions, in long-term opioid users. When she compared these patients to other pain patients or even to the general population, she did not find any correlation between alexithymia and pain, pain medication or any other factor she studied. Studies such as this one encourage patients to be more pro-active about their treatment, and reduce fears of unwanted side-effects.

Patients in intensive care units are often unable to self-report the pain they feel, either at rest or during

procedures, yet a lack of proper assessment of pain levels is associated with longer stay in hospital and worse outcomes.

Céline Gélinas is therefore also working to optimize behavioural methods to assess pain in these patients. She presented a wide range of

behaviours in patients that can be used as indicators of pain, and noted that patients with altered levels of consciousness could have atypical behaviours in response to pain. Knowledge of the ways patients respond to pain allow caretakers to better manage this pain.

Differences in pain sensitivity between individuals are well documented, but the underlying causes are not well known. **Pierre Rainville** designed a study to investigate the effects of stress and attention on pain perception and responses. His results support the idea that multiple mechanisms of pain perception could exist as diverting attention away, or focusing attention on a painful stimulus can affect the pain patients report and their reflex reaction to pain differently.

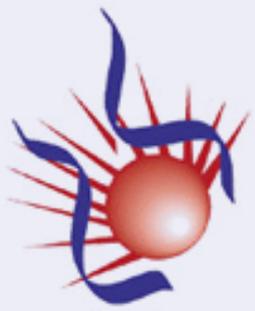
Proper diagnosis of lower back pain is difficult, and current methods, like lumbar MRI often result in both false positive and false negative results for herniated disks. The imprecision of this method can result in unnecessary intervention and surgery. **Yoram Shir** has therefore investigated an alternative method to detect nerve defects, by detecting painful trigger points, which could



Grisell Vargas-Schaeffer



Céline Gélinas



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indicate irritated nerves. Patient examination in the clinic has validated that painful trigger points are found in most patients suffering from lower back pain, and that these can help diagnose and localize defects at the root of nerves that cause pain in patients.

Uncontrollable pain is the most common cause of disability in working adults, and pain is also associated with depressive symptoms. **Yoram Shir** used information from the Quebec Pain Registry to investigate the effects depression and different non cancerous pain conditions on employment of patients, and found that depressive symptoms could predict unemployment for many pain conditions. Except in the case of lower back pain, the level of pain and other factors did not predict employment. These results suggest interventions aimed at reducing depression could help patients rejoin the work force.

Investigating the underlying causes of chronic pain

Yves De Koninck presented work done using a model of maternal loss in mice developed by **Marco Battaglia**. In this model mouse pups are transferred to mothers other than their biological mother daily in the days following birth. Though the pups are well cared for by their foster mothers, they sustain long-lasting effects of this separation, including differences in response to various pain assays. These preliminary results suggest that early life adversity could affect pain sensitivity.



Ana Velly

Recent studies have shown that adolescent and adult children of parent with chronic pain are more likely to also have chronic pain. It is also well-known that stress in mothers can lead to differences in pain response in their offspring. **Jeffrey Mogil** presented preliminary results showing that chronic pain in mouse mothers was associated with increased pain sensitivity in their offspring, especially in females. Using this model, he will be able to investigate whether pain is a stressor that affect the offspring, whether epigenetic modifications are involved, and sex difference in transmission and inheritance of different pain sensitivity.

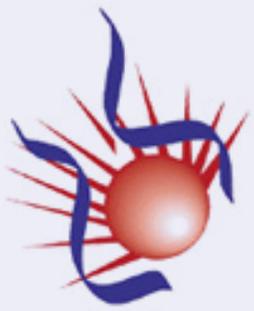


Jeff Mogil

Temporomandibular Disorders cause pain and dysfunction of the jaw joint and muscles. In some cases, it can lead to chronic pain and disability. **Ana Velly** presented research that aims to identify factors associated with this condition, and especially factors associated with acute to chronic pain transition. Knowing these prognostic factors will help develop strategies to prevent the development of chronic pain.

Research to understand pain mechanisms

In some patients, cutting sympathetic nerves (sympathectomy) has been shown to alleviate chronic pain. **Alfredo Ribeiro-da-Silva's** and his team have shown that sympathetic nerves sprout in conditions of chronic pain in rat models, and investigated whether the new neurons formed contribute to pain. His results show that sprouting does have a role in both inflammatory and chronic pain, but that the new neurons persist after the pain



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has subsided. Further investigations will help clarify the role of these new nerve cells by looking at the consequences of activating them.

In addition to neurons, many neuroscientists, such as **Ji Zhang**, are starting to recognize the important roles cells that surround neurons, such as microglia, play in pain. Dr. Zhang showed that microglia is a very dynamic cell population, whose numbers vary in response to injury-triggered chronic pain.

Glutamate is a neurotransmitter involved in the transmission of pain signals in the body. Many different glutamate receptors exist in cells, and **Terence Coderre** presented experiments conducted to determine the role of a newly discovered glutamate receptor which is located inside cells, at the surface of the cell nucleus. His results show that this receptor uses a different signaling pathway than receptors on the cell surface. These difference will help dissect out the roles of different glutamate receptor, and to better understand the transmission of the pain signal through these receptors.

Research Platform Updates

Marie-Ève Paquet presented the many tools available to QPRN members through the Molecular Tools Platform. A large number of tools for gene transfer and expression of various markers in cells and animals are available. The protocols used to generate these molecular tools are being optimized, and additional tools are generated regularly. Available tools can be



Marie-Ève Paquet

viewed at neurophotonics.ca/molecular-tools

The QPRN implemented the Quebec Pain Registry platforms in 2008. It consists of a registry of over 7000 Quebec pain patients for which standardized information about pain characteristics, treatments, and many social, psychological variables are collected. **Mark Ware** presented an overview of the data collection process and the current uses of the registry. Users include researchers at universities from Canada and the US and pharmaceutical companies. The majority of users are members of the QPRN.

To learn more about our members and their important research, visit the members page of our website: <http://qprn.ca/members>, or visit our homepage to get our latest news:

<http://qprn.ca>.

Annual General Assembly

The 2014 Winter Pain Meeting concluded with the Annual General Assembly, during which the following new members were welcomed:

Marco Battaglia

Laurent Bouyer

Luda Diatchenko

Mélanie Morin

Mathieu Piché

Frédéric Dionne (associate member)

We extend our warmest welcome to our new members.