College of Health Sciences
Faculty of Medicine & Dentistry
Anesthesiology & Pain Medicine

UNIVERSITY OF ALBERTA

15th ANNUAL GELFAN AND BELL

ANESTHESIOLOGY CONTINUING EDUCATION AND RESEARCH SYMPOSIUM

Friday May 22, 2026
Maple Leaf Room - Lister Centre

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification (MOC) program of the Royal College of Physicians and Surgeons of Canada and approved by the Division of Continuing Medical Education, College of Medicine, University of Saskatchewan. You may claim a maximum of 3.75 hours (credits are automatically calculated).

Update from the Labs

Dr. Michael Zaugg

The Zaugg Lab is focused on translational research using rodent and large animal models (pig, piglets). The scientific questions that we try to solve are tightly related to clinical problems where we close existing knowledge gaps and find innovative solutions to directly benefit patients.

We have currently two main research programs:

1) Heart donation for transplantation after circulatory death (DCD): how can we best resuscitate the heart after circulatory death and improve long-term graft function in DCD heart transplants? This research is funded by CIHR and we closely collaborate with Dr. D.H. Freed from Cardiac Surgery. Our former PhD student, Dr. Fulin Wang, recently published important work in this field (see Figure below). Please read her story by clicking on this link: https://www.ualberta.ca/en/pharmacology/news/2026/zani-wang-zaugg-dcd.html

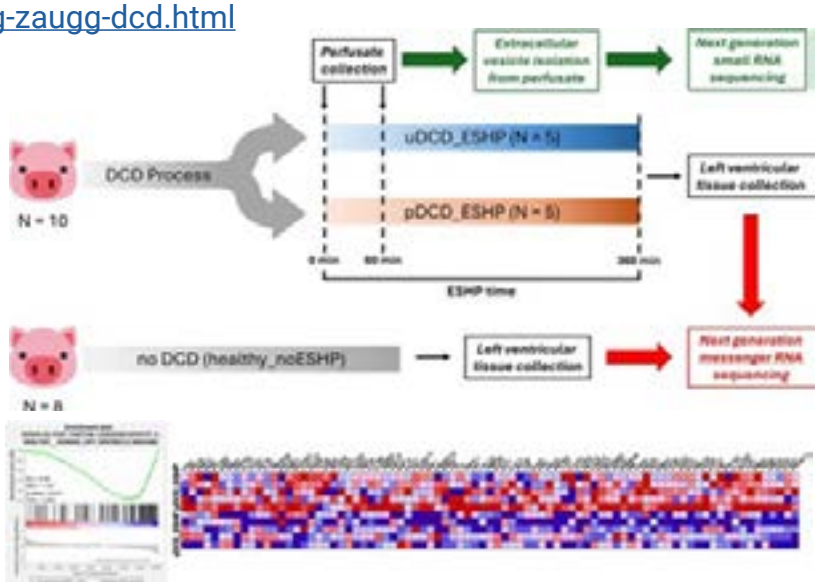

Figure shows experimental protocol and gene set enrichment analysis comparing DCD hearts undergoing ex situ heart perfusion in the absence and presence of a cardioprotective treatment. For details, see our publication (link above).

2) Clinical nutrition: we have developed a novel lipid emulsion (Vegaven) for parenteral nutrition with superior biological actions including strong anti-inflammation/protection of the liver, enhanced insulin signaling and immunity, and neuroprotection. We have tested Vegaven in two studies with neonatal piglets in close collaboration with Dr. J.M. Turner from Pediatrics. The novel lipid emulsion is on its way to commercialization. This research is funded by CIHR and Crohn's Colitis Canada.

Collaborations are always welcome and we specifically support research contributing to the understanding of physiological changes (e.g. genetic, metabolome- or microbiome-related) in response to anesthesia and/or to surgical stress in patients.

Dr. Bradley Kerr

Overview. Research in the Kerr lab is focusing on the neuro-immune contributions to chronic pain states arising from injury or disease in the nervous system. We have a primary focus on pain in auto-immune disorders such as MS and interests in understanding the causes of neuropathic pain after traumatic peripheral nerve injury. We have also recently begun studies using a mouse model

of chemotherapy induced neuropathy. The lab employs a variety of behavioral assays to assess pain and nociception in rodents and we also use cell and molecular techniques to understand the underlying mechanisms generating chronic pain. The Neuroimmunology and Pain Lab is located on the 5th floor of HMRC. It's is a shared research space with the lab of Dr. Jason Plemel (Dept. of Medicine). We currently have a collaborative project examining macrophage phenotypes after peripheral nerve injury that includes contributions from the UofA Multidisciplinary Pain Clinic and Dr. Bruce Dick (Dept. of Anesthesiology). Other collaborations involve members of the Dept. of Pharmacology (Dr. Anna Taylor and Dr. Harley Kurata) as well as a project with George Washington University (Labs of Dr. John Bethea and Dr. Kayla Ngyuen) examining TNF, ER stress and the effects on neural plasticity.

The Neuroimmunology and Pain Lab

Funding. The lab is currently funded by CIHR Project Grants "Inflammation, plasticity and pain: Understanding sex differences in autoimmune related pain" and "Deciphering macrophage phenotypes in neuropathic pain".

Recent Publications

1. Andrea G Klassen, Timothy N Friedman, Gustavo Tenorio, Jason R Plemel, Anna MW Taylor and Bradley J Kerr (2026). Peripheral immune response and axonal degeneration in the hind paw skin of mice with experimental autoimmune encephalomyelitis. Neurobiology of Pain (Vol. 19), https://doi.org/10.1016/j.ynpai.2025.100207
2. Madelene Faye S Ho , Olivia Farkas, Andre Vilela Faria , Jason R Plemel, Bradley J Kerr (2025) A recent history of immune cell sex differences in the peripheral nervous system in persistent pain states. Brain Behavior and Immunity DOI: 10.1016/j.bbi.2025.05.004
3. Aislinn D Maguire, Timothy N Friedman, Elyse Willis, Elise Gosse, Grayden Kuypers, Dania Villarreal Andrade, Camille Stephens, Gustavo Tenorio, Jason R Plemel and Bradley J Kerr (2025) Sex-specific involvement of CGRP signaling for pain in experimental autoimmune encephalomyelitis. Pain Reports (accepted in press)
4. Brady P. Hammond; Sameera Zia; Eugene Hahn; Margarita Kapustina; Tristan Lange; Sarah Friesen; Rupali Manek; Kelly V. Lee; Adrian Castellanos-Molina; Floriane Bretheau; Mark S Cembrowski; Bradley J. Kerr; Steve Lacroix; Jason Plemel (2025) CSF-1R ligands promote microglial proliferation but are not the sole regulators of developmental microglial proliferation. Development DOI: 10.1242/dev.204610
5. Aislinn D Maguire; Shawn M Lamothe; Muhammad Saad Yousuf; Kree Goss: Jayadeep Rao; Gustavo Tenorio; Sridhar R Kaulagari; Lori Hazlehurst; Jason R Plemel; Anna MW Taylor; Harley T Kurata; Thomas Simmen and Bradley J Kerr (2025) Inhibition of Endoplasmic Reticulum Oxidoreductin 1 modulates neuronal excitability and nociceptive sensitivity in mice. Anesthesiology DOI: 10.1097/ALN.0000000000005453
6. Timothy N. Friedman, Shawn M. Lamothe, Aislinn D. Maguire, Thomas Hammond, Gustavo Tenorio, Brett J. Hilton, Jason R. Plemel, Harley T. Kurata, and Bradley J Kerr (2024) Plasticity of mouse dorsal root ganglion neurons by innate immune activation is influenced by electrophysiological activity. Journal of Neurochemistry DOI: 10.1111/jnc.16292

Dr. Stephane Bourque

Although our laboratory has not changed locations, our space on the 3rd floor of the Katz Centre for Pharmacy and Health Research has been renamed the Stollery Children's Hospital Foundation Innovation Laboratories, in recognition of the generous support from the Stollery Children's Hospital Foundation.

My laboratory uses integrative and molecular approaches to investigate two broad areas of cardiovascular physiology. The first focuses on elucidating the mechanisms by which stressors, including iron deficiency and sepsis during gestation and early infancy, affect fetal and neonatal growth and development, and how these early insults predispose offspring to lifelong health complications. Building on this theme, we recently established a national collaborative effort with investigators from UBC and Dalhousie University to characterize the unique immuno-metabolic signatures that distinguish neonatal from adult host responses to sepsis; funding for this work is currently being sought from CIHR. The second area focuses on identifying mechanisms underpinning sepsis-induced cardiomyopathy and acute kidney injury. These projects are currently supported by CIHR funding, and we anticipate several publications on these topics in the coming year.

We also recently received a CIHR Project Grant, in collaboration with Dr. Robin Clugston (Department of Physiology), to investigate how iron deficiency affects vitamin A homeostasis. This work builds on our recent finding that iron restriction in rats impairs hepatic vitamin A mobilization, which may exacerbate the biochemical consequences of iron deficiency across tissues; a manuscript reporting these findings is expected later this year.

Finally, our laboratory has completed data collection for a clinical cohort study examining the relationship between maternal and fetal biomarkers of iron status. Trainees with relevant research experience are encouraged to reach out if they are interested in contributing to data analysis.

Congratulations to Rohini Roy Roshmi on the completion of her MSc degree!

Selected references

1. Chatterjee P, Molberg R, Kirschenman R, Holody CD, Quon A, Spaans F, Bourque SL, Lemieux H, Davidge ST. Sex-specific impact of selective reduced uterine placental perfusion model of preeclampsia on fetal cardiac maturation and mitochondrial function. Am J Physiol Regul Integr Comp Physiol. 2025 Sep 1;329(3):R474-R486. *Recognized for distinction in scholarship in APS Select.

2. Rachid J, Vu J, Wiedemeyer A, Roshimi R, Noble RMN, Bourque SL‡. Effects of iron deficiency anemia on maternal hemodynamics and cardiac function in pregnant spontaneously hypertensive rats. Cardiovasc Res. 2025 Oct 24;121(12):1956-1968. (IF: 13.08). *Editor's Choice Selection in Cardiovascular Research.

Recent Trainee Awards

In 2025-2026, trainees from our group were awarded 14 scholarships and travel awards totalling almost $200,000. A few notable awards include:

1. The Izaak Walton Killam Memorial Scholarship, which is among the highest honors bestowed to trainees by the University of Alberta, was awarded to Si Ning Liu and Jad Julian Rachid.

2. WCHRI Graduate Studentship to Si Ning Liu

3. Alberta Graduate Excellence Scholarship to Jennie Vu and Ibrahim Khodabocus

4. FoMD 75th Anniversary Award to Crystal Mulik