

JUSTIN S. LAWLEY, Ph.D. - 17.02.1983

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University of Innsbruck,
Division of Physiology,
Department of Sport Science,
A-6020 Innsbruck, Austria,
<https://www.uibk.ac.at/isw/index.html.en> |

EDUCATION

- 2016 - 2017 **Junior faculty**
University of Texas Southwestern Medical School and Division of Cardiology,
Institute for Exercise and Environmental Medicine
- 2012 - 2016 **Postdoctoral Research Fellow**
University of Texas Southwestern Medical School and Texas Health Presbyterian
Hospital/Institute for Exercise and Environmental Medicine
Faculty Mentor Benjamin D. Levine, M.D. Professor Internal Medicine, Cardiology
- Sept 2009 **Ph.D.**
May 2013 **Title: Acute Mountain Sickness: The Elusive Phenotype**
Bangor University
Faculty Mentors Jamie Macdonald, Physiology Ph.D.
 Samuel Oliver, Physiology Ph.D.
 Paul Mullins, Psychology / Neuroimaging Ph.D.
- Sept 2006 **BSc. (Hons) Sport Science with Outdoor Activities (First Class)**
Sept 2009 Bangor University

FELLOWSHIPS

- Oct 2013-2016 Fellow of the National Space Biomedical Space Research Institute (NSBRI)

PUBLICATIONS

- Howden** et al., Reversing the Cardiac Effects of Sedentary Aging in Middle Age, A Randomized Controlled Trial: Implications for Heart failure Prevention. *Circulation In Press* (**Impact Factor**, 14,4)
<https://www.ncbi.nlm.nih.gov/pubmed/29311053>
- Hieda** M et al., Pre-load Corrected Dynamic Starling Mechanism in Patients with Heart Failure with Preserved Ejection Fraction. In Press *J Appl Physiol* (**Impact Factor**, 3.0)
<https://www.ncbi.nlm.nih.gov/pubmed/29051333>
- Howden** et al., Integrative blood pressure response to upright tilt post renal denervation. *Hypertension* 2017 (**Impact Factor**, 3.4)
<https://www.ncbi.nlm.nih.gov/pubmed/28338768>
- Lawley** et al., Effect of gravity and microgravity on intracranial pressure. *J Physiol.* 2017 (**Impact Factor**, 4.7)
<https://www.ncbi.nlm.nih.gov/pubmed/28092926>
- Howden, Lawley** et al., [Invited Review] Potential role of endurance training in altering renal sympathetic nerve activity in chronic kidney disease *Auton Neurosci* 2017 (**Impact Factor**, 1.6)
<https://www.ncbi.nlm.nih.gov/pubmed/27908698>
- Lawley** et al., Unexpected reductions in regional cerebral perfusion during prolonged hypoxia. *J Physiol.* 2017 (**Impact Factor**, 4.7)
<http://www.ncbi.nlm.nih.gov/pubmed/27506309>

Khan et al., Measurement of cerebral blood flow with phase contrast MRI and duplex ultrasonography. *J Cereb blood flow metab* (**Impact Factor**, 5.4)

<http://www.ncbi.nlm.nih.gov/pubmed/26873888>

Cornwell III et al., Restoration of pulsatile flow reduces sympathetic nerve activity among individuals with continuous-flow left ventricular assist devices (2015). *Circulation* (**Impact Factor**, 14.4) Dec 15(24):2316-22.

<http://www.ncbi.nlm.nih.gov/pubmed/26510698>

Lawley et al., [Invited Review] Cerebral spinal fluid dynamics: Effect of hypoxia and implications for altitude illness (2016). *J Appl Physiol* (**Impact Factor**, 3.0) Jan 15(2):251-262.

<http://www.ncbi.nlm.nih.gov/pubmed/26494441>

Lawley et al., Normobaric hypoxia and symptoms of acute mountain sickness: Elevated brain volume and intracranial hypertension (2014). *Ann Neurol* (**Impact Factor**, 10.0) Jun;75(6):890-898

<http://www.ncbi.nlm.nih.gov/pubmed/24788400>

Lawley et al., Prolonged (9 hours) poikilocapnic hypoxia (12% O₂) augments cutaneous thermal hyperaemia in healthy humans (2014). *Exp Physiol* (**Impact Factor**, 2.7) Jun;99(6):909-920

<http://www.ncbi.nlm.nih.gov/pubmed/24706191>

Lawley et al., Investigation of whole brain white matter identifies altered water mobility in the pathogenesis of high-altitude headache (2013). *J Cereb blood metab.* (**Impact Factor**, 5.4) June;33: 1286-1294

<http://www.ncbi.nlm.nih.gov/pubmed/23736642>

Oliver et al., High altitude impairs *in vivo* T cell-mediated immune response in humans (2013). *High Alt Med Biol.* (**Impact Factor**, 1.3) June;14(2): 144-149

<http://www.ncbi.nlm.nih.gov/pubmed/23795734>

Naushad et al., Does proteinuria-inducing physical activity increase biomarkers of acute kidney injury? (2012). *Kidney Blood Press Res.* (**Impact Factor**, 2.1) Nov;28(1):278-289

<http://www.ncbi.nlm.nih.gov/pubmed/23182776>

Lawley et al., Optic nerve sheath diameter is not related to high-altitude headache: a randomized controlled trial (2012). *High Alt Med Biol.* (**Impact Factor**, 1.3) Sept;13(3):193-199

<http://www.ncbi.nlm.nih.gov/pubmed/22994519>

Lawley. [Letter to the editor] Identifying the possible risk factors for high altitude headache in mountaineers (2012). *Cephalalgia.* (**Impact Factor**, 4.1) Apr;31(6):706-11.

<http://www.ncbi.nlm.nih.gov/pubmed/21926157>

Macdonald et al., Body composition at high altitude: a randomized placebo-controlled trial of dietary carbohydrate supplementation (2009). *Am J Clin Nutr.* (**Impact Factor**, 6.7) Nov;90(5):1193-202.

<http://www.ncbi.nlm.nih.gov/pubmed/19793859>

BOOK CHAPTERS

Robert C. Roach, **Justin S. Lawley** and Peter H. Hackett (In press). The Physiology of High Altitude. Paul S. Auerbach (Ed.). *Wilderness Medicine* 6th edition. Elsevier Health Sciences.

Peter H. Hackett, Andrew M. Luks, **Justin S. Lawley** and Robert C. Roach (In press). High altitude medicine and pathophysiology. Paul S. Auerbach (Ed.). *Wilderness Medicine* 6th edition. Elsevier Health Sciences

RECENT CONFERENCE PRESENTATIONS

Invited presentations

Oral - Lawley *et al.* 24-hour translaminar pressure in microgravity: implications for optic remodelling in space (2014). NSBRI optic modelling workshop. Houston, Texas, USA.

Oral - Lawley *et al.* Athletes, Astronauts and Altitude (2016). Centre of Heart, Lung and vascular Health, UBC Okanagan, Canada.

Oral - Lawley *et al.* Visual impairment in astronauts: mechanistic insights and proposed countermeasures (2015). NSBRI user panel advisory council. Houston, USA

Oral - Lawley *et al.* Effect of hypoxia on cerebral spinal fluid dynamics: implications for acute mountain sickness (2015). Hypoxia, Lake Louise, Canada.

Plenary lecture - Lawley *et al.* Intracranial pressure during daily life in healthy adults. What does microgravity add to the mix? (2015). NASA Human Research Program, Houston, Texas, USA.

Oral - Lawley *et al.* Intracranial pressure during microgravity (2014). NASA Research and Clinical Advisory Panel. Houston, Texas, USA.

Oral - Lawley *et al.* Investigating the safety, efficacy and detection of xenon supplementation for increased red cell mass in highly trained athletes (2014). United States Anti-Doping Agency (USADA) symposium. Phoenix Utah, USA

Oral - Lawley *et al.* Intracranial pressure during daily life in healthy adults. What does microgravity add to the mix? (2014). NASA symposium: Unravelling the Visual Impairment Intracranial Pressure enigma, Houston, Texas, USA.

National and International meetings

Oral - Lawley *et al.* Direct measurements of intracranial pressure in hypobaric hypoxia: implications for acute mountain sickness (2016). Wilderness Medical Society, Telluride, Colorado, USA. - **Winner young investigator award.**

Oral - Lawley *et al.* Effect of Gravity on intracranial pressure: evidence from direct invasive recordings in humans. (2016). NASA Human Research Program, Houston, Texas, USA.

Poster - Lawley *et al.* (2015). Neural hemodynamic balance in the supine and upright posture: Impact of healthy human aging. Physiological Society, Cardiff, United Kingdom

Poster - Lawley *et al.* (2015). Difference in carotid pulsatile wall tension explain variability in muscle sympathetic outflow between young men but not women. Preliminary observations in humans. Physiological Society, Cardiff, United Kingdom

Poster - Lawley *et al.* (2015). Regional heterogeneity in microvascular cerebral blood flow during prolonged hypoxia: insights from magnetic resonance imaging. Physiological Society, Cardiff, United Kingdom

Poster - Lawley *et al.* Intracranial pressure during daily life in healthy adults. What does microgravity add to the mix? (2014). American College of Sports Medicine conference on Integrative Physiology, Miami, Florida, USA

Oral - Lawley *et al.* Effect of hypoxia on intracranial pressure and acute mountain sickness (2013). International Society for Magnetic Resonance in Medicine, Salt Lake City, USA.

Poster - Lawley *et al.* Combined diffusion and T₂ parameters identify early onset intracellular edema during simulated altitude (2013). International Society for Magnetic Resonance in Medicine, Salt Lake City, USA.

Oral - Lawley *et al.* Having a swell time at altitude: Investigation of whole brain white matter identifies altered water mobility in the pathogenesis of high-altitude headache (2013). Hypoxia, Lake Louise, Canada. - **Runner up postdoctoral oral award.**

Poster - Lawley *et al.* On the limit and feeling the pressure at altitude: Intracranial pressure and acute mountain sickness (2013). Hypoxia, Lake Louise, Canada.

GRANT CAPTURE

Total grant capture \$1,370,991

Texas Institute for Brain Injury and Repair. (Co-I, obtain preliminary data, draft grant application, research design, data collection, data dissemination) *Funded.* **Head elevation and lower body negative pressure optimally lower intracranial pressure in traumatic brain injured patients.** The objective is to obtain pilot data on the efficacy of a lower body negative sleep sac to consistently lower intracranial pressure and improve intracranial stability and patient with traumatic brain injury. \$94,591

National Space Biomedical Research Institute, (First Award Program – competitive renewal). Lawley (PI, obtain preliminary data, draft grant application, research design, data collection, data dissemination) 10/01/2015 - 10/01/2016. **Microgravity Induced Visual Alterations and Intracranial Pressure.** The primary objective is to provide novel data about the efficacy of lower body negative pressure to mimic daily upright posture by intermittently lowering intracranial pressure (ICP) while asleep in simulated microgravity. \$55,000

National Space Biomedical Research Institute, (First Award Program – competitive renewal). Lawley (PI, obtain preliminary data, draft grant application, research design, data collection, data dissemination) 10/01/2015 - 10/01/2016. **Microgravity Induced Visual Alterations and Intracranial Pressure.** The primary objective is to provide novel data about the efficacy of lower body negative pressure to mimic daily upright posture by intermittently lowering intracranial pressure (ICP) while asleep in simulated microgravity. \$55,000

National Space Biomedical Research Institute. Lawley (Co-I, obtain preliminary data, draft grant application, research design, data collection, data dissemination). - Score 1.0. **STOP VIIP Study: Safe and Effective Countermeasures to Reduce Intracranial Pressure and Ameliorate Visual Impairment in Astronauts.** This project will provide novel data about the efficacy of lower body negative pressure to mimic daily upright posture by intermittently lowering directly measured intracranial pressure (ICP) while in simulated microgravity. \$500,000

National Space Biomedical Research Institute, (SMART CAP Program). Lawley (Co-I, obtain preliminary data, draft grant application, research design, data collection, data dissemination) 10/01/2014 - 10/01/2015. **Development of a pathophysiological countermeasure to VIIP.** The overall objective of this application is to develop a comfortable lower body vacuum system to be worn during sleeping or activity capable of lowering intracranial pressure and ameliorating visual impairment in astronauts during space flight. \$100,000.

Partnership for Clean Competition, Lawley (Co-I, draft grant application, research design, data collection, data dissemination) 10/01/2014 - 10/01/2016. **Investigating the safety, efficacy and detection of xenon supplementation for increased red cell mass in highly trained athletes.** The primary objective of this investigation is to make the first measurements of adverse symptomology and hemodynamics, HIF-1 α , EPO, vascular endothelial growth factor (VEGF), haemoglobin mass and exercise performance in healthy subjects and trained athletes after acute and chronic exposure to the noble gas and anesthetic agent, xenon. \$345,000

National Space Biomedical Research Institute, (First Award Program). Lawley (PI obtain preliminary data, draft grant application, research design, data collection, data dissemination) 10/01/2013 - 10/01/2015. **Microgravity Induced Visual Alterations and Intracranial Pressure.** The primary objective of this application is to make the first direct, invasive measurements of intracranial

pressure, cerebral hemodynamics, and structure of the visual apparatus during changes in hydrostatic gradients induced by simulated (bedrest) and real (parabolic flight) microgravity. \$100,000

Wilderness Medical Society, (Charles S. Houston award). Lawley (PI, obtain preliminary data, draft grant application, research design, data collection, data dissemination) 07/01/2013 – Present **Hypoxia Induced Intracranial Pressure Alterations**. The global object of this proposal is to determine precise changes in intracranial pressure, measured invasively, with exposure to hypobaric hypoxia. Thus determining the role intracranial pressure plays in the development of acute mountain sickness. \$6,000

North Wales National Health Service, (Small Research Grant). Lawley (Co-PI, obtain preliminary data, draft grant application, research design, data collection, data dissemination) 06/09/2009 – 01/09/2013. **Intracranial pressure in experimental models of headache**. The overall objective of this grant was to examine serial measurements of intracranial pressure, estimated by optic nerve sheath diameter, in an experimental model of High-altitude headache, induced by passive ascent to high altitude and manipulated by allocation of participants to receive either Acetazolamide (a recognized treatment of acute mountain sickness) or placebo. £5,000

PROFESSIONAL SERVICE

Editorial	<i>American Journal of Applied Physiology</i> <i>American Journal of Physiology-Heart and Circulatory Physiology</i> <i>Physiological measurement</i> <i>Scientific Reports</i> <i>Annals of Neurology</i> <i>Neuroscience</i> <i>NeuroImage</i> <i>Journal of headache and facial pain</i> <i>Cerebral Blood Flow and Metabolism</i> <i>Cephalalgia (headache)</i> <i>High altitude Medicine and Biology</i> <i>Wilderness & Environmental Medicine</i> <i>Journal of Sports Science</i>
Memberships	American Physiological Society British Physiological Society American College of Sports Medicine Wilderness Medical Society International Society for Mountain Medicine

SYMPOSIUM CHAIR

2017 Charis: EJ Howden **JS Lawley**. International Society for Autonomic Neuroscience
Proposed symposia: Recent Developments in Autonomic Circulatory Control During Exercise
Speakers: Drs. Craig Steinback, Gilbert Moralez & Vaughan Macefield

EXTRA CURRICULAR

I previously took part in a UK based program to engage school children in science “I’m a scientist get me out of here”; where I placed second by student vote. I spend my leisure time with my wife and three children and sneak away when possible to pursue outdoor based activities such as mountain biking, fell running, rock climbing and high altitude mountaineering.