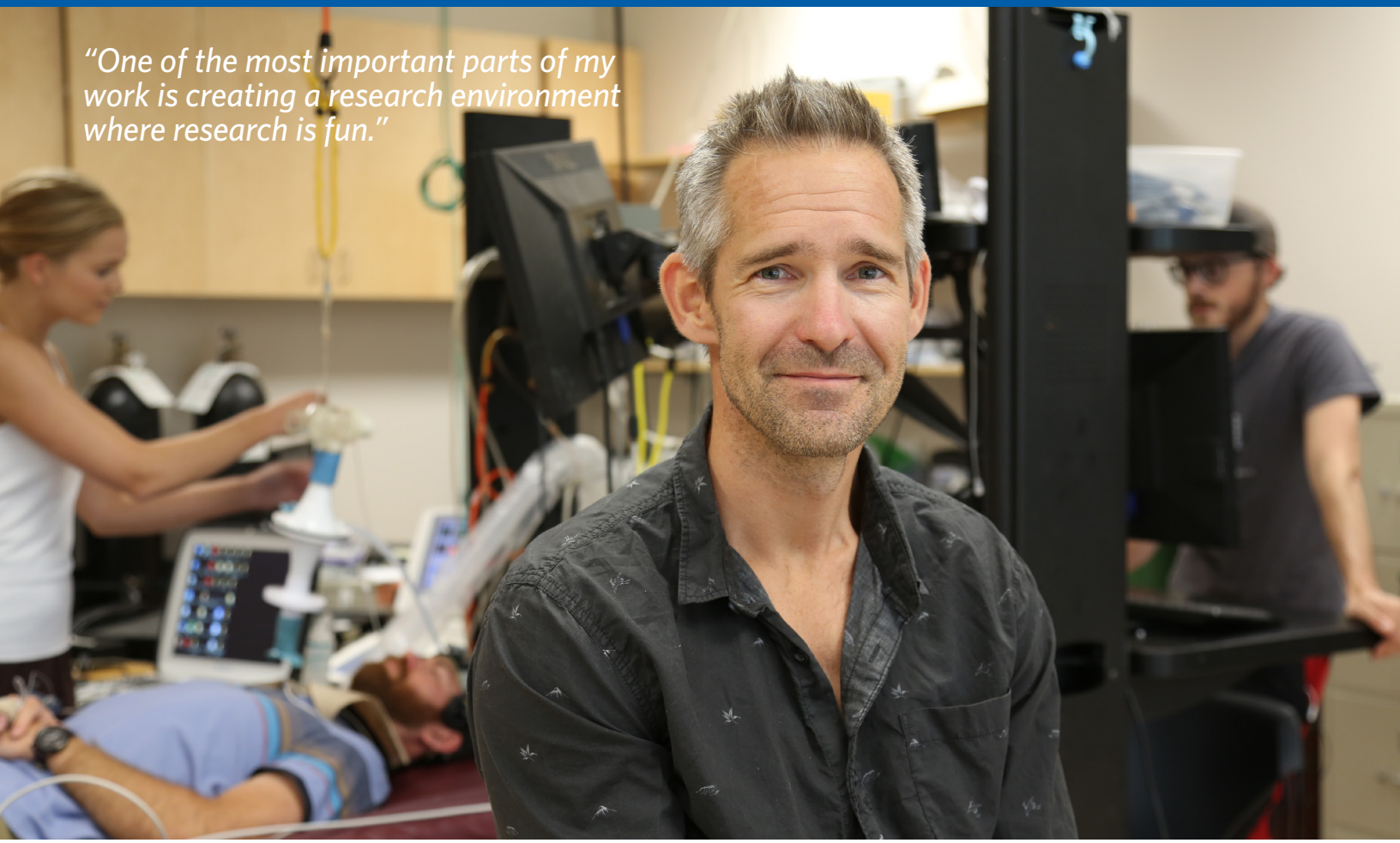
PHIL AINSLIE

SCHOOL OF HEALTH AND EXERCISE SCIENCES



Ainslie's research is focused on understanding how the body copes and compensates to environmental stress.

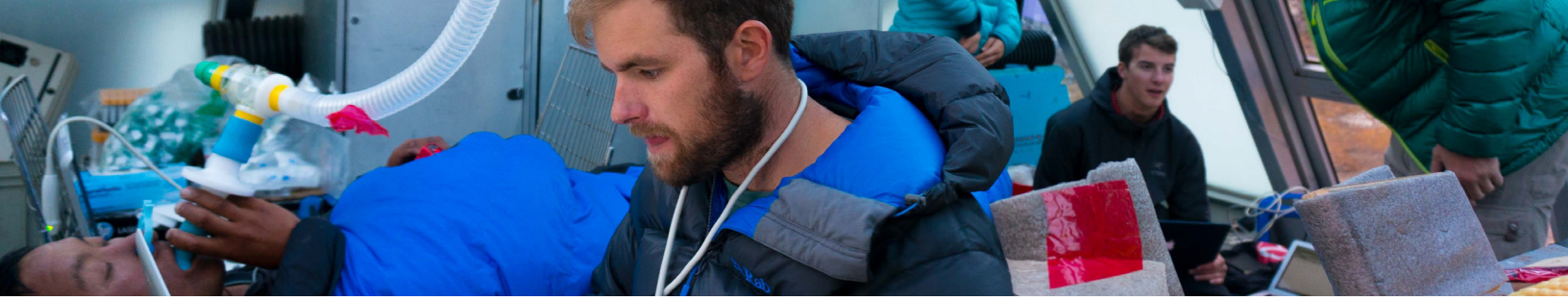
Ainslie and his team investigate the fundamental mechanisms that regulate human brain blood flow in health, disease and during environmental stress.

From high-altitude residents to deep-water divers, humans have adapted to thrive in extreme environments.

It is remarkable how some humans can survive over 10 minutes without breathing or can function and exercise during extreme reductions in oxygen levels. Ainslie and his team explore how the human body responds to extreme alterations in oxygen tension both at rest and during exercise. Using sophisticated techniques to unravel the mechanisms that regulate how the brain (and other organs) manages its blood supply, the eventual goal of Ainslie's research is to better understand how some populations can adapt (or, in cases, maladapt) to their habitat. These populations include elite free divers, those who can tolerate extremes of temperature and indigenous populations who have adapted in their low oxygen environment. By better understanding these unique populations and situations, elucidating the pathways responsible for adaption/maladaptation to hypoxia has potential clinical implications for disease featuring low oxygen delivery (e.g. heart failure, pulmonary disease). In addition, a greater understanding of vascular function at high altitude will clinically benefit the global estimated 85 million high altitude residents.

Main Research Focus:

1. Fundamental mechanisms of brain blood flow regulation in humans
2. Influence of environmental stress (e.g., temperature, hypoxia, diving, pollution) on integrative physiological function
3. Acclimatization, adaption and maladaptation of newcomers and indigenous populations at high altitude



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About

Ainslie's initial interest in how the human body adapts to environmental stress began on mountain peaks across the world, where he worked as a mountaineering guide. It was atop these peaks, that Ainslie's interest was piqued in how humans adapt or maladapt to their environment. This passion fueled the completion of his Ph.D. (in exercise physiology & metabolism) as a collaborative project between the Liverpool John Moores University, University of Manchester and University of Oxford. At UBC's Okanagan campus, he has built a diverse expertise in assessing cerebrovascular function during physiological scenarios ranging from sleep to exercise, the stresses of high altitude to deep-sea diving, and healthy aging to heart disease, has made him an international authority on brain vascular function. His work in cerebrovascular physiology and pathology encompasses the lifespan, with clinical focus on spinal cord injury, lung disease and ischemic brain injuries. Ainslie has published >300 peer-reviewed scientific articles with >12k citations. He has recently co-authored two textbooks in the area of environmental physiology, including the 6th Edition of the textbook High-Altitude Medicine and Physiology. Ainslie has won numerous national and international awards for his research and sits on various senior international scientific leadership and advisory groups.

Research Environment

Ainslie is the Co-Director of the Centre for Heart, Lung and Vascular Health (CHLVH), which was established as a centre of research excellence in the BC interior to focus specifically on heart, lung and vascular health research throughout the human lifespan. The mission for the Centre is to produce and disseminate internationally leading research into the causes, consequences and treatment of cardiovascular, pulmonary and cerebrovascular diseases. The Centre and related labs employ duplex ultrasound, end-tidal forcing, vascular function testing, muscle sympathetic nerve activity, brain arterial-venous difference measures, and molecular quantification of vasoactive factors. In addition to mechanistic laboratory-based experiments Ainslie leads regular field expeditions, including various outreach initiatives, to high altitude to study acclimatization and adaptation with particular focus on indigenous populations located in the mountainous regions of Tibet, South America and Ethiopia.

Next Stages

Ainslie works in collaboration with numerous industry and academic partners around the world on a wide range of projects and initiatives. His work is diverse and interdisciplinary. For example, Ainslie is a member of the Comfort-Optimized Materials For Operational Resilience, Thermal-transport and Survivability (COMFORTS) network, which aims to combining innovative textile properties with ballistic-resistant material using cross-linker technology.

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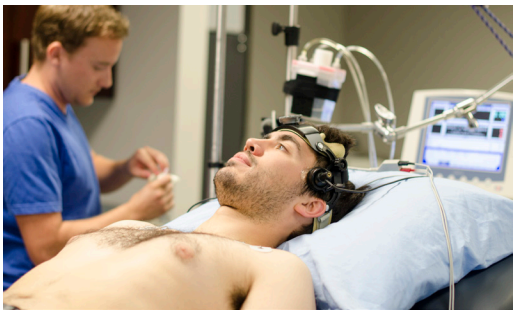
Okanagan Campus



FEATURED PROJECT

Global research expedition begins release of 15 major studies

A group of international researchers went to great heights to better understand how high altitude affects both newcomers and Indigenous populations. The 45-person international research team completed more than 15 major scientific studies in Peru's Cerro de Pasco—a mining town at 4,330m. During the 30-day expedition, the team conducted more than 750 study sessions accounting for over 3,000 hours of experimental testing. The 2018 expedition included undergraduate and graduate students, as well as researchers and physicians from six countries and 11 universities.

The expedition studies have the potential to improve quality of life and treatment strategies for those suffering from low oxygen levels in their body, such as those afflicted by cardiovascular, pulmonary and cerebrovascular diseases. The findings will inform an understanding maladaptation to such stress helps inform unique avenues for new treatment strategies.

TO LEARN MORE:

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