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## References

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## UK High Altitude Research: A report from the Birmingham Medical Research Expeditionary Society (BMRES) Altitude Research Conference, December 4, 2009, held at the Birmingham Medical Institute, United Kingdom

### To the Editor:

We would like to report on the 1-day altitude medicine research meeting held at the Birmingham Medical Institute, Birmingham, UK on December 4, 2009. The meeting provided an opportunity for researchers from several different high altitude research groups in the United Kingdom to present their findings and share experiences from recent laboratory and field work. In addition, the meeting aimed to welcome newcomers, foster collaboration, and encourage more individuals to get involved in altitude research.

Data presented in the meeting drew from several recent expeditions and chamber studies, demonstrating how active these UK groups currently are. Recent projects included the University of Bangor trip to the European Alps, the BMRES hypoxic chamber studies in Glamorgan and field studies in Northern Chile, University of Oxford chamber and field studies, University of Edinburgh research at Kilimanjaro, and Caudwell Xtreme Everest expeditions to Cho Oyu and Everest.

The first of the morning's sessions concentrated on molecular studies on oxidative and nitrosative stress. Professor Martin Feelisch (University of Warwick) began the meeting with a summary of the role of nitric oxide in the body's response to hypoxia. Professor Damian Bailey (University of Glamorgan) presented an overview of current evidence for the production of free radicals in hypoxia and demonstrated that radical production correlates with impaired cerebral autoregulation. He presented the hypothesis that blood-brain barrier function becomes dysregulated in hypoxia, and

may be a contributory factor to the development of high altitude cerebral edema (HACE). Nicky Kolfshoten (Caudwell Xtreme Everest) presented a study that examined the potential correlation between headache score and head size (a proxy measure of intracranial volume) in trekkers ascending to Everest base camp, and Andrew Sutherland (University of Oxford) gave an update on optic nerve sheath diameter and correlation with acute mountain sickness (AMS) scores. These studies prompted a vigorous debate about whether AMS and HACE are the result of raised intracerebral volume or intracranial pressure.

Included in a session on training and acclimatization were presentations on studies into weight loss and gastrointestinal function at altitude. Data from Xtreme Everest, presented by Maryam Khoshravi, investigated weight loss on two separate Himalayan expeditions to Cho Oyu and Everest, and an intrinsic genetic basis for high altitude weight loss was proposed. This was complemented by a BMRES study investigating the mechanism of high altitude gastrointestinal dysfunction, which measured gut blood flow in response to food ingestion.

The day highlighted the volume of current work investigating pulmonary hypertension at altitude, especially at the University of Oxford Department of Physiology, Anatomy and Genetics: Mari Herigstad presented data from a chamber study looking at the effect of hypoxia on the ability of the pulmonary vasculature to dilate on exercise, and Nick Talbot described his work on the effect of iron supplementation and depletion on pulmonary hypertension. Cameron Holloway (University of Oxford) presented some fascinating results that may shed light on mechanisms of cardiac function at altitude, of which we eagerly await full publication. Attendees were also reminded of the high altitude pulmonary edema (HAPE) database ([www.hape.org.uk](http://www.hape.org.uk)) which now has more than 600 possible cases of HAPE registered, and people are encouraged to look at the website, and publicize it when traveling at altitude.

Between sessions there was time available to view the posters, providing a valuable opportunity for some of the younger members of the research groups to present and discuss their work. The prize for best poster was jointly awarded to Karl New and Sarah Major. The Research award was won by Cameron Holloway, and Maryam Khoshravi was given the Young Investigator award. In addition, a hotly contested photographic competition ran throughout the day, which was won by Paul Firth and Hannah Collins. During the afternoon David Hillebrandt gave an update on the Diploma in Mountain Medicine (Univer-

sity of Leicester), which now has more than 100 graduates from all corners of the globe.

Paul Firth (Harvard University) concluded the meeting with a fascinating talk that discussed findings from his extensive research into the causes of deaths on Mount Everest, a difficult and important subject.

The day brought into focus the interesting work that is currently going on in UK altitude research. It also highlighted some of the controversial “hot topics”, such as the etiology of HACE and application of new techniques, including cardiac magnetic resonance spectroscopy, portable duplex Doppler ultrasound, and

magnetic resonance angiography, to illuminate the path towards improved understanding of high altitude pathophysiology.

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