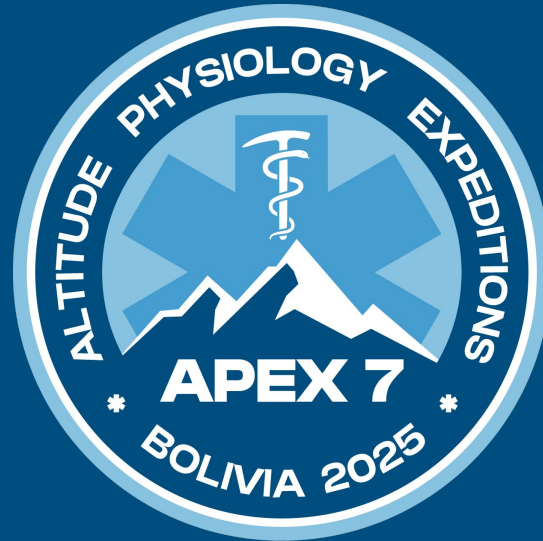


APEX 7 Expedition

Bolivia 2025



Volunteer Information Evening



THE UNIVERSITY of EDINBURGH

1. Meet the Committee
2. What is APEX?
3. APEX 7
4. High Altitude
5. Research
6. Expectations of volunteers
7. Experiences of a Volunteer
8. Costs/Application Process
9. Q&A
10. Pear Tree



Meet the Committee



CAMERON
Expedition
Leader



DAVID
Expedition
Leader

Meet the Committee



ANYA
Head of
Research



CAMI
Head of
Funding, Grants
and Sponsorship



BEN
Head of
Funding, Grants
and Sponsorship

Meet the Committee



ELLA

Head of
Volunteers and
Wellbeing



ELS

Head of
Volunteers and
Wellbeing



COLETTE

Head of
Communications
and Events

What is APEX?



- Founded by a group of Medical Students in 2001
- Altitude Physiology Expeditions
 - High Altitude Medical Research
- 6 Successful Expeditions to Bolivia
 - Usually occurs around every 3 years
 - Most recent June/July 2022
 - Volunteers from the previous expedition form the committee to lead the next one
- World's leading student led high altitude expeditions



HIGH ALTITUDE MEDICINE & BIOLOGY
Volume 19, Number 1, 2018
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DOI: 10.1089/ham.2017.0164

Special Rep



Respiratory Medicine
Volume 103, Issue 8, August 2009, Pages 1182-1188



The 2018 Lake Louise Acute Mountain Sickness Score

Robert C. Roach,¹ Peter H. Hackett,¹ Oswald Oelz,² Peter Bärtsch,³ Andrew M. Luks,⁴ Martin J. MacInnis,¹ J. Kenneth Baillie,^{6,7} and The Lake Louise AMS Score Consensus Committee

Abstract

Roach, Robert C., Peter H. Hackett, Oswald Oelz, Peter Bärtsch, Andrew M. Luks, Martin J. MacInnis, J. Kenneth Baillie, and The Lake Louise AMS Score Consensus Committee. The 2018 Lake Louise Acute Mountain Sickness scoring system sleep at altitude closely related experience, ex statement resul Congress in Bk February 2015, updated instruc

Keywords: A/

HIGH ALTITUDE MEDICINE & BIOLOGY
Volume 13, Number 4, 2012
© Mary Ann Liebert, Inc.
DOI: 10.1089/ham.2011.1097

Retinal Vessel Tortuosity in Response to Hypobaric Hypoxia

Ian J. C. McCormick,¹ John Sommer,² Daniel S. Morris,³ Thomas J. MacGillivray,⁴ Rupert R. A. Bourne,⁵ Suber S. Huang,⁶ Alasdair MacCormick,⁷ Peter A. Aspinall,⁸ J. Kenneth Baillie,⁹ A. A. Roger Thompson,¹⁰ and Bal Dhillon¹¹

Abstract

MacCormick, Ian J.C., John Sommer, Daniel S. Morris, Thomas J. MacGillivray, Rupert R.A. Bourne, Suber S. Huang, Alasdair MacCormick, Peter A. Aspinall, J. Kenneth Baillie, A.A. Roger Thompson, and Bal Dhillon. Retinal vessel tortuosity in response to hypobaric hypoxia. *High Alt Med Biol* 13:263-268, 2012.—**Purpose:** Retinal vascular tortuosity is associated with retinopathy of differing etiologies, including hypertension, diabetes, and hypoxia. However, detailed understanding of the underlying pathophysiology is lacking. The aim of this study was to map changes in tortuosity associated with hypoxia at high altitude, and to determine the influence of sildenafil and an antioxidant preparation on altitude-induced tortuosity. **Methods:** We measured the tortuosity of retinal vessels using a semi-automated method in 35 young, healthy subjects exposed to hypobaric hypoxia for 7 days at 5200 m, and compared the measurements to those from the same vessels at sea level. These subjects simultaneously took part in a randomized double-blind placebo-controlled trial of sildenafil and antioxidant. Comparison of tortuosity between these subgroups was performed. **Results:** High altitude was associated with the development of retinal tortuosity in individual vessels. A non-significant trend suggests this is limited by prophylaxis with sildenafil or antioxidant.



Cellular Haemostasis and Platelets 253

Hypoxia Modulates Platelet Purinergic Signalling Pathways

Gordon G. Paterson^{1,2} Jason M. Young^{1,2} Joseph A. Willson³ Christopher J. Graham^{1,2,9} Rebecca C. Dru^{1,2} Eleanor W. Lee^{1,2} Greig S. Torpey^{1,2} Sarah R. Walmsley³ Melissa V. Chan⁴ Timothy D. Warner^{1,9} John Kenneth Baillie^{1,5,6} Alfred Arthur Roger Thompson^{1,7,9}

¹APEX (Altitude Physiology Expeditions), Edinburgh, United Kingdom
²Edinburgh Medical School, University of Edinburgh, Edinburgh, United Kingdom
³University of Edinburgh Centre for Inflammation Research, The Queen's Medical Research Institute, University of Edinburgh, Edinburgh, United Kingdom
⁴Centre for Immunobiology, Blizard Institute, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, United Kingdom
⁵Division of Genetics and Genomics, The Roslin Institute, University of Edinburgh, Edinburgh, United Kingdom
⁶Department of Anaesthesia, Critical Care and Pain Medicine, Royal Infirmary of Edinburgh, NHS Lothian, Edinburgh, United Kingdom
⁷Department of Infection, Immunity and Cardiovascular Disease, University of Sheffield, Sheffield, United Kingdom

Address for correspondence: Alfred Arthur Roger Thompson, BSc, MB ChB, MRCP, PhD, Department of Infection, Immunity and Cardiovascular Disease, University of Sheffield, M177A, Royal Hallamshire Hospital, Beech Hill Road, Sheffield S10 2RX, United Kingdom (e-mail: A.R.Thompson@sheffield.ac.uk).

Thromb Haemost 2020;120:253-261.

Abstract

Background Hypoxia resulting from ascent to high-altitude or pathological states at sea level is known to increase platelet reactivity. Previous work from our group has suggested that this may be adenosine diphosphate (ADP)-specific. Given the clinical importance of drugs targeting ADP pathways, research into the impact of hypoxia on platelet ADP pathways is highly important.

Methods Optimal aggregometry was performed on plasma from 29 lowland residents according to 4,700 m, allowing systematic assessment of platelet reactivity in response to several platelet agonists. Aggregometry was also performed in response to ADP in the presence of inhibitors of the two main ADP receptors, P2Y₁ and P2Y₁₂ (MRS2500 and cangrelor, respectively). Phosphorylation of vasodilator-stimulated phosphoprotein (VASP), a key determinant of platelet aggregation, was analysed using the VASPFix assay.

ORIGINAL RESEARCH: HYPOXIA-RELATED ISSUES | VOLUME 131, ISSUE 5, P1473-1478, MAY 2007
Download Full Issue

Endogenous Urate Production Augments Plasma Antioxidant Capacity in Healthy Lowland Subjects Exposed to High Altitude

Baillie J. Kenneth, BSc, MBChB, MRCP • Bates Matthew G.D., BSc, MBChB, MRCP • Thompson A. A. Roger, BSc, MBChB, MRCP • ... Gulliver-Sloan Fiona, BSc • Maxwell Simon R.J., MD, FRCP • Webb David J., MD, FRCP • Show all authors

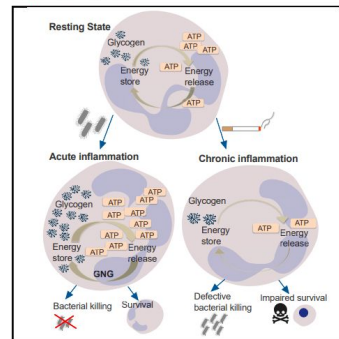
DOI: <https://doi.org/10.1378/chest.06-2235>

Article

Cell Metabolism

Neutrophils Fuel Effective Immune Responses through Gluconeogenesis and Glycogenesis

Graphical Abstract



Authors

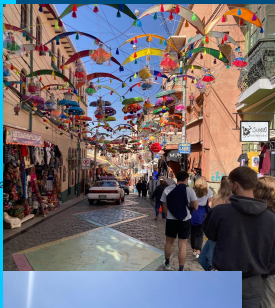
Pranvera Sadiku, Joseph A. Willson, Ellise M. Ryan, ..., Peter Carmeliet, Moira K.B. Whyte, Sarah R. Walmsley

Correspondence

sarah.walmsley@ed.ac.uk

In Brief

Neutrophils are required to meet their energy demands at inflamed sites where nutrients may be limited. Sadiku et al. provide evidence of a specialized metabolism that enables neutrophils to utilize glycogen cycling for energy production. This is essential for neutrophil function and survival, and dysregulation is associated with chronic disease states.



Largest simultaneous controlled ascent in history!

Dates

- Saturday 28th June 2025 → Sunday 13th July 2025

Country

- Bolivia

Accommodation

- La Paz Hostel (TBC) @3800m
- Huayna Potosi Base Camp @4800m

APEX 7



Arrive in La Paz
(3800m)

5 Nights

June 28th
2025





Arrive in La Paz
(3800m)

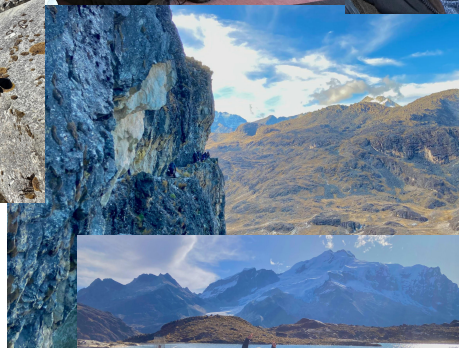
July 3rd
2025

5 Nights

8 Nights

June 28th
2025

La Paz ->
Huayna Potosi
(4800m)





**Arrive in La Paz
(3800m)**

**Huayna Potosi ->
La Paz**

**July 3rd
2025**

**July 11th
2025**

5 Nights

8 Nights

1 Night

**June 28th
2025**

**La Paz ->
Huayna Potosi
(4800m)**



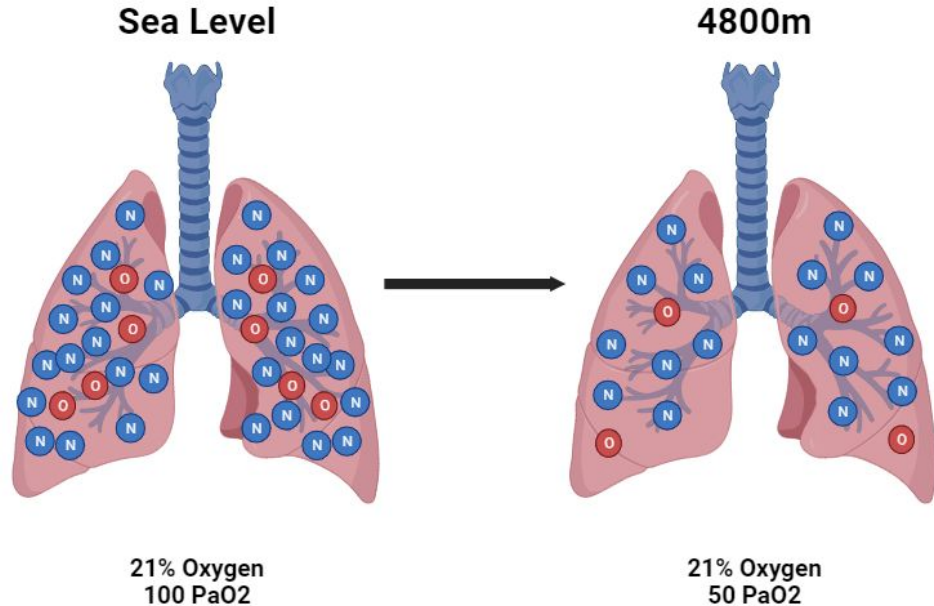
**Arrive in La Paz
(3800m)**

**Huayna Potosi ->
La Paz**



Altitude sickness

- >2500m
- Unable to predict individual response (yet!)
- Content of air is the same
- Partial O₂ Pressure Roughly **50%** of Sea Level



Acute Mountain Sickness (AMS)

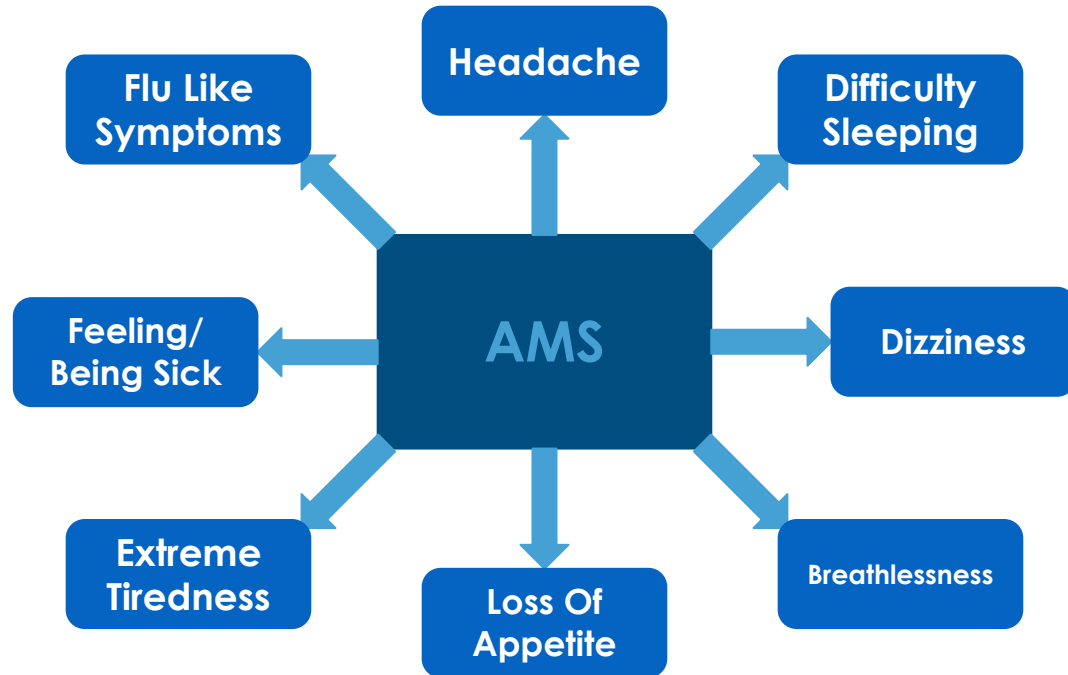
- Common
- Scoring Criteria (LLS)
 - Used on Expedition

HAPE = Fluid in Lungs

HACE = Fluid in Brain

Severe but RARE

→ RAPID DESCENT



4x Expedition Doctors

- **Specialists** in the field of Altitude Medicine, Remote and Rural Medicine, Respiratory Medicine, General Practice
- Medical equipment

24/7 access to transport to lower altitudes

Why?

- APEX was founded with the intention of conducting medical research at high altitude
- Unique- completely led by students at UofE
- Findings used internationally to improve patient care
 - Hypoxic patients in critical care
 - Mountaineers going to high altitudes



Research- APEX 6

Circadian rhythms



Neutrophil Study



Dark adaptation



Calculating lung oxygenation



Taking blood for the first time!



APEX 7 Research

- *Thermogenesis- how does hypoxia affect brown adipose tissue metabolism?*
 - *Clinically relevant- diabetes etc*
- *Neutrophil study*
- *Mood disorders and Acute Mountain Sickness scoring*

More to come!!

Open to all students from UofE- not just medical students

What does this mean for me?

- Participation in research studies as a subject
 - You consent to the studies you want to take part in
- Opportunity to help take part in medical research
- Not a requirement to be super interested in research- you just need to be willing to commit to doing the necessary things of the projects you have consented for
 - E.g. taking part in baseline testing, filling in the necessary questionnaires, etc
 - Some studies but not all will involve procedures like getting blood taken

Expectations of Volunteers



Pre-Expedition

1) Baseline Testing/Samples

QMRI/Central

2) Team Building Events / Socials / Weekends

3) Medical Talks/Information Evenings



Expectations of Volunteers



On Expedition

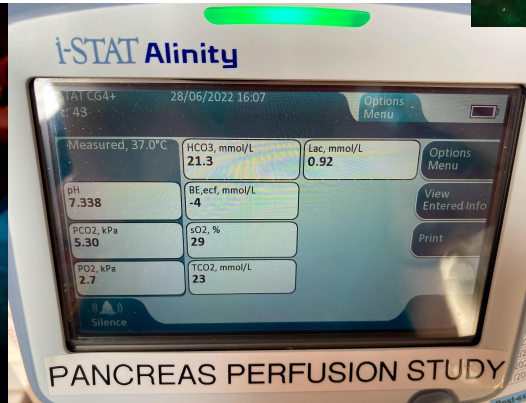
- 1) Data Collection
- 2) Medical Checks
- 3) Buddy Support System
- 4) Sponsorship/Media Tasks

Expectations of Volunteers



Post Expedition

- 1) Post-expedition Testing/Samples
- 2) Reunion Events!



Experiences as a Volunteer on APEX 6



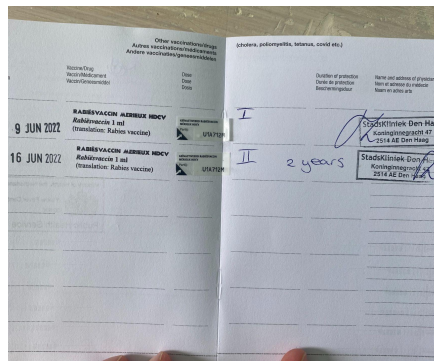
Pre Expedition - Team building/socials



Experiences as a Volunteer on APEX 6



Pre Expedition - Travel



Experiences as a Volunteer on APEX 6



Acclimatisation - La Paz



Experiences as a Volunteer on APEX 6



On Expedition - Up the mountain - Hostel



Experiences as a Volunteer on APEX 6



On Expedition - Up the mountain - Day in the life

9am: Breakfast

Morning: Walk/swim,
experiments

12-1pm: Lunch

Afternoon: Reading
(book club), games,
journaling, TV show,
more experiments

7pm: Dinner

Evening: Games, bonfire



Experiences as a Volunteer on APEX 6



End of Expedition/Onward travel



Post-Expedition Travelling



Huayna Potosi



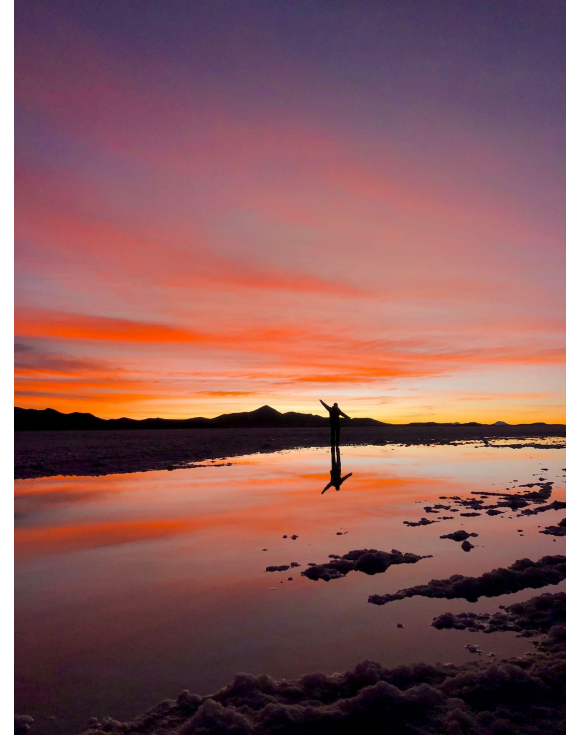
Post-Expedition Travelling



Salt Flats (+ Lake Titicaca)



Post-Expedition Travelling



Post-Expedition Travelling



Salkantay Trek (+ Cusco)



Post-Expedition Travelling



Post-Expedition Travelling

Arequipa



Post-Expedition Travelling



Colca Canyon (+ Lima)





THE UNIVERSITY of EDINBURGH
Student Experience Grants



alpkit

KETTLEproduce ltd



APEX6



Top Tips!!

By Suzie Green, Head of Publicity and Volunteers



Applying

- You don't need to know people (even better if you don't 😊)
- Take a chance
- Know what APEX involves





The Research

- Get involved!
- Unique opportunities
- Improve your understanding
- CV...

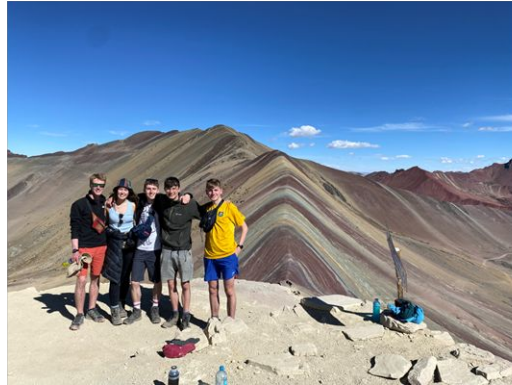
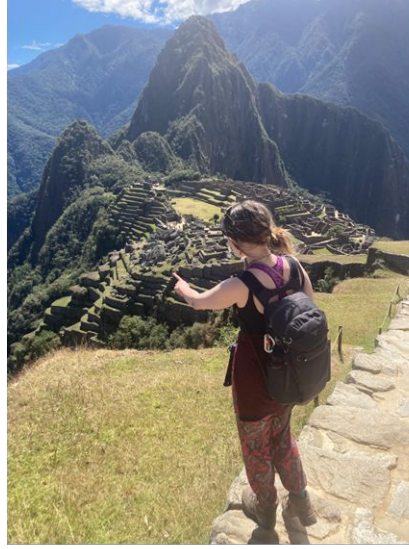




Volunteer Life

- Learn some good card games
- Bring some good books
- Socialise, make friends, be yourself...





Student Experience

- Social: friendships, relationships, independence, resilience, teamwork, empathy...
- Academic: research experience and insight, 2 perspectives, CV, connections...
- Cultural: languages, culture, food, multiple countries...



Our Feedback

- How do you think this trip enhanced your university experience?
 - *"It gave me an insight into medical research and also introduced me to an amazing group of people who I hope to keep in touch with as I go through university and beyond."*
 - *"Being a participant of APEX6 has exposed me to a side of medicine seen rarely within the traditional medical curriculum." "Apex has given me the opportunity to see what it means to be a research participant as well as researcher."*
 - *"I got the opportunity to meet loads of people on my course, develop skills that will be useful to me in my professional career, and majorly boost my confidence."*



THANK YOU!



How much will the expedition cost?



Flights

~£800 Return (Bought In Bulk)

Expedition Contribution

~£400 (*TBC*)

Vaccinations

Essential ones free on NHS

Extras variable depending on post-expedition plans (~£150 for Rabies & Yellow Fever)

Insurance

~£50-100 (variable depending on onward travel)

Additional Costs

Kit, Merch, Spending money, Onward travel

How can I pay for the expedition?



APEX 7

- Reduced costs for all volunteers through grant and sponsorship funding
- Aiming to reduce costs of flights and expedition contribution
- Provision of further subsidised WP places

Fundraising

- Get creative!

Grants

- Go Abroad Fund , RMS travel + Study fund
- Many third-party grants

Application Process



2 Stages

1. **Online Form**
2. **Interview**

Online Form opening Early **October 2024**

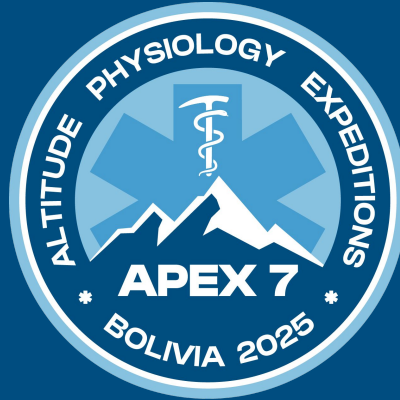
Interviews **November 2024**

Outcomes - **December 2024**

bit.ly/altitude7



Questions?



@altitudeapex



APEX - Altitude
Physiology Expeditions



apex7@altitude.org

Website : altitude.org