



4th Annual ISEMPH Meeting

Wed–Sat, August 1-4, 2018

Park City, Utah

Wednesday, August 1

7:30am–8:00pm REGISTRATION

8:00am–3:30pm

CME PRE-CONFERENCE: EVOLUTION AND WILDERNESS MEDICINE— ADAPTATION TO EXTREME ENVIRONMENTS *(Additional fee required)*

Joe Alcock, Chair Faculty: Cynthia Beall, Rick Henriksen, Melissa Ilardo, Michael Lauria, Scott McIntosh, Diane Rimple, Blair Wolf

A core competency of wilderness medicine is to understand how human physiology responds to extreme environments. Most human existence has taken place in environments without modern medicine. This legacy has shaped physiologic responses to extreme conditions, including temperature, altitude, dehydration, and other stresses. This session explores how adaptive responses to environmental challenges, their constraints and trade-offs, can inform wilderness medical care.

2:00–4:00pm **AFTERNOON HIKE FOR EARLY ARRIVALS**

3:30–5:00pm



INFORMAL DISCUSSION: DEVELOPING THE FIELD—UPDATES AND IDEAS

Stephen Stearns, Chair (All welcome to attend)

6:00–8:00pm **WELCOME RECEPTION & BOOK EXCHANGE**

Thursday, August 2

6:15–7:15am **SUNRISE HIKE**

6:30–7:15am **YOGA or MORNING RUN**

7:00–8:00am **CONTINENTAL BREAKFAST**

7:45–8:00am **OPENING REMARKS**
Stephen Stearns & Joe Alcock

8:00–8:45am



PLENARY (P1): EVOLUTION OF DISGUST AS A PARASITE AVOIDANCE BEHAVIOUR *Val Curtis*

8:45–10:00am

SYMPOSIUM I: EVOLUTION AND HEALTH BEHAVIOUR

Chair: Gillian Pepper

Presentations: *Athena Aktipis, Bruce Ellis, Mike Gurven, Dandara Ramos*

Discussion and Q&A

The same selective forces that shape our biology thereby influence our behaviour. Evolutionary insights can thus inform our understanding of health behaviours, enabling improved public health interventions. This session will explore evolutionary perspectives on a range of health behaviours including diet, health-risking behaviours, and treatment uptake, and discuss their implications for public health.

10:00–10:30am **BREAK – PREVIEW POSTERS & VISIT EXHIBITS**

10:30–11:30am **PLATFORM (ORAL) PRESENTATIONS: SESSION 1**

Session 1A: Evolution and Mental Health

10:30 **Garcia**—Depression T2 Diabetes

10:45 **Syme**—Suicide Honest Apology

11:00 **Zefferman**—PTSD Tin Turkana

11:15 **Swain Ewald**—Depression Inflammation

Session 1B: Milk and Early Life

10:30 **Kotler**—Tempo of Childhood

10:45 **Fujita**—Anemia and Milk

11:00 **Morgan**—Life Stress & Pregnancy

11:15 **Greenwald**—Breastfeeding

11:30am–12:30pm **PLATFORM (ORAL) PRESENTATIONS: SESSION 2**

Session 2A: Selection and Anatomy

11:30 **Staub**—Swiss Body Mass

11:45 **Boyd**—Dental Development

12:00 **Hanzal**—Evolution of Continence

12:15 **Uhl**—Comparative Osteoarthritis

Session 2B: Life History Tradeoffs

11:30 **Jasienska**—High Parity & Health

11:45 **Frumkin**—Reproduction Oxidative Stress

12:00 **Koepke**—Obstetrical dilemma

12:15 **Ryan**—Costs of Reproduction

12:30–1:30pm **BOX LUNCH**

12:30–1:30pm



ISEMPH MEETING: PUBLICATIONS COMMITTEE/EMPH EDITORS

1:30–2:15pm



PLENARY (P2): LEARNING AND PERTURBING THE EVOLUTIONARY MECHANISMS DRIVING THERAPEUTIC RESISTANCE IN CANCER AND PATHOGENS
Jacob Scott

2:15–3:30pm

SYMPOSIUM II: COMPARATIVE ONCOLOGY

Co-Chairs: *Athena Aktipis & Amy Boddy*

Presentations: *Lisa, Abegglen, Athena Aktipis, Amy Boddy, Valerie Harris*

Discussion and Q&A

Comparative oncology is a new and expanding field in cancer biology that examines cancer susceptibility across species. Evolution has, over millions of years, inherently explored cancer defense mechanisms with each new multicellular species. By identifying how certain species evolved mechanisms of cancer suppression, we can begin to identify which underlying molecular targets are potentially more exploitable for human cancer prevention and treatment. In this session we will explore a broad range of topics in comparative oncology, including cancer rates across the tree of life, understanding vulnerability to cancer, and cancer comparative genomics.

3:30–3:45pm **BREAK – PREVIEW POSTERS & VISIT EXHIBITS**

3:45–4:30pm **PLATFORM (ORAL) PRESENTATIONS: SESSION 3**

Session 3A: Cancer

3:45 **Lu**—Germline Variants

4:00 **Hamilton**—Cancer Stem Cells

4:15 **Organ**—Developmental Phylogenetics

Session 3B: Regulation & Homeostasis

3:45 **Perlman**—Control Mechanisms

4:00 **Nijhout**—Homeostasis Cryptic Gene Variation

4:15 **LeGrand**—Immune Regulation

4:30–6:00pm

SYMPOSIUM III: NOVEL SOLUTIONS TO CHEMOTHERAPEUTIC RESISTANCEChairs: *Michael Hochberg*Presentations: *Sam Brown, Ben Chan, Michael Hochberg, Nina Wade***Discussion and Q&A**

Resistance to chemotherapies is an ever-growing problem in treating diseases ranging from bacterial and parasitic infections to cancers. Resistance often leaves doctors with few or no alternatives to treat either chronic illness or life-threatening situations. Evolutionarily-guided therapies offer the prospect of improved outcomes and spectacular successes. This symposium will bring together experts to discuss how environmental and ecological conditions can be shaped so as to reduce or prevent the evolution of resistance and increase prospects for therapeutic success.

6:30–8:00pm

EVENING EVENT/ACTIVITY**Friday, August 3**

6:15–7:15am

SUNRISE HIKE

6:30–7:15am

YOGA or MORNING RUN

7:00–8:00am

CONTINENTAL BREAKFAST

7:45–8:00am

HOUSEKEEPING ANNOUNCEMENTS*Joe Alcock*

8:00–8:45am


PLENARY (P3): BUILDING A COSTLY BRAIN: IMPLICATIONS FOR THE EVOLUTION OF HUMAN CHILDHOOD AND THE DEVELOPMENTAL ORIGINS OF METABOLIC DISEASE
Chris Kuzawa

8:45–10:00am

SYMPOSIUM IV: EVOLUTION AND MEDICINE IN LIGHT OF THE MICROBIOMEChair: *Seth Bordenstein*Presentations: *Katherine Amato, Seth Bordenstein, Jennifer Stearns***Discussion and Q&A**

Emerging research initiatives are now conceptualizing the human as an ecosystem - the sum of a host and its associated microbes that vary in time, space and function. This session will explore a broad range of potential evolutionary influences on the human-microbe ecosystem and impacts on health, nutrition, and development. Special emphasis will be placed how life scientists and clinicians can join together to advance microbiome scholarship beyond its incipient stage.

10:00–11:00am

POSTER PRESENTATIONS WITH AUTHORS & BREAK

11:00am–12:00pm

PLATFORM (ORAL) PRESENTATIONS: SESSION 4**Session 4A: Microbiome**

11:00 Ozga—Forager Dental Calculus

11:15 Ojong—Iron Coadaptation

11:30 Barrier—Skin Surgery Microbiome

Session 4B: Evolutionary Medicine Education

11:00 D. Anderson—Inventory Nat Selection

11:15 Nesse—EvMedEd

11:30 Grunspan—State of US Ev Med

11:45 Burt—Unwilling Student

12:00–1:00pm

PLATFORM (ORAL) PRESENTATIONS: SESSION 5**Session 5A: Resistance Evolution**12:00 Barlow—Fitness & β lactamases

12:15 Paajimans Bednet—Insecticides

12:30 Gurney—Phage Antibiotic Combo

12:45 Huijben—Resistance Immune

Session 5B: Metabolism

12:00 Pontzer—Exercise is Essential

12:15 Corbett—Immune Insulin Sensitivity

12:30 Nunez—DLM Poverty Glucose

12:45 Urlacher—Amazonian Child Energy

1:00–2:00pm

BOX LUNCH

1:00–2:00 pm

**ISEMPH MEETING: EDUCATION & OUTREACH** (*All are welcome to attend*)

2:00–2:45pm

**PLENARY (P4): PERINATAL IMPACTS, MICROBIOTA AND HEALTH***Maria Gloria Dominguez-Bello*

2:45–4:00pm

SYMPOSIUM V: ADAPTATION AND CRITICAL CAREChair: *Joe Alcock*Presentations: *Scott Aberegg, Janelle Ayres, and John Marshall***Discussion and Q&A***“Our arsenals for fighting off bacteria are so powerful . . . that we are more in danger from them than the invaders.” Lewis Thomas 1972*

Is this true? Fever, mobilization of white blood cells, acute phase response proteins are functional responses (e.g. adaptations). This poses a dilemma: when and how to intervene in sepsis. This session will explore whether the human body's response is the problem. We discuss how evolutionary insights can point to better treatments in critical illness.

4:00–4:30pm

(POSTER) FLASH TALKS

4:30–4:45pm

BREAK – VISIT POSTERS & EXHIBITS

4:45–5:30pm

PLATFORM (ORAL) PRESENTATIONS: SESSION 6**Session 6A: Hot Topics**

4:45 Ilardo—Sea Nomads

5:10 Zost—Egg-adapted Flu vaccine strains

5:15 Martin—Genetic risk prediction across diverse populations

Session 6B: Evolution and Behavior

4:45 Sarafin—Sexually Transmitted Manipulation

5:00 Doyle—Depression and Infection

5:15 A. Anderson—Evidence for Adaptive Anemia

5:30–7:00pm

**ISEMPH MEETING: MEETINGS AND PROGRAM COMMITTEES**

6:30–8:30pm

EVENING EVENT/ACTIVITY**Saturday, August 4**

6:15–7:15am

SUNRISE HIKE

6:30–7:15am

YOGA or MORNING RUN

7:00–8:00am

CONTINENTAL BREAKFAST

7:45–8:00am **HOUSEKEEPING ANNOUNCEMENTS**

Joe Alcock

8:00–8:45am



PLENARY (P5): RESISTANCE EVOLUTION—AND ITS MANAGEMENT—IN A MULTI-DRUG HOSPITAL PATHOGEN

Andrew Read

8:45–9:45am

PLATFORM (ORAL) PRESENTATIONS: SESSION 7

Session 7A: Host Pathogen Evolution

8:45 **Nunn**—Vector-Borne Disease

9:00 **Torosin**—Evolution of TLR7

9:15 **Emery**—Thompson Chimp Infection

9:30 **Green**—Origins Black Death

Session 7B: Microbial Evolution

8:45 **Rorick**—Malaria Antigens

9:00 **Graves**—Iron-related fitness

9:15 **Cooper**—Evolution in Biofilm

9:45–9:50am

STRETCH BREAK

9:50–10:50am

PLATFORM (ORAL) PRESENTATIONS: SESSION 8

Session 8A: Immunity

09:50 **Graham**—Taiwanese Antibodies

10:05 **Wiessner**—Late Night Cortisol

10:20 **Trumble**—Diesel Exposome

10:35 **Mattison**—Reactive Protein Mosuo

Session 8B: Genomics and Complexity

09:50 **Duello**—Concept of Race in HGP

10:05 **Bergstrom**—Burning Money

10:20 **Chevalier**—William H. Welch

10:35 **Laubichler**—Complexity

11:00am–12:00pm



ISEMPH ANNUAL BUSINESS MEETING (*All members welcome to attend*)

12:00–1:45pm

LUNCH (*On your own*)

1:45–2:30pm



PLENARY (P6): ADOLESCENT REPRODUCTIVE DEBUT: LIFE HISTORY TRADEOFFS IN A CLINICAL CONTEXT

Katie Hinde

2:30–3:15pm

OMENN PRIZE LECTURE

Nina Wade

3:15–3:30pm

BREAK

3:30–4:15pm

WILLIAMS PRIZE LECTURE

Birgitte Hollegaard

4:15–5:30pm

THE FUTURE OF EVOLUTIONARY MEDICINE: A MODERATED DISCUSSION & Q&A

"A man's friendships are one of the best measures of his worth." ~ Charles Darwin

Moderator: Joe Alcock

Discussants: Amara Frumkin, Joseph Graves, Barbara Natterson-Horowitz, Randolph Nesse, and Stephen Stearns

Will evolutionary medicine eventually become a foundational science - embedded into all relevant fields - or will evolutionary medicine continue to have distinct priorities, goals, and outlook? As evolutionary medicine develops, how do we ensure it is inclusive now and in the future, welcoming to a diverse community of scientists?

5:30pm

FINAL ADJOURNMENT

6:30–10:00pm

BANQUET & FAREWELL CELEBRATION