### THURSDAY, OCTOBER 25TH, 2018

**Plenary Lecture**

1.0 PLENARY LECTURE  
*SPONSORED BY THE JOURNAL OF EXPERIMENTAL BIOLOGY*

Thur., 5:00 -6:00 PM, Astor Ballroom

5:00 PM 1.1 Tesla Valves and Other Fluidic Devices in Reptile Lungs  
**CG Farmer. Univ. of Utah**

6:00 PM OPENING RECEPTION  
Thur., 6:00 -8:00 PM, Grand Gallery

### FRIDAY, OCTOBER 26TH, 2018

**Oral**

2.0 HIBERNATION AND DAILY TORPOR: ABSTRACT DRIVEN SESSION – 1  

Fri., 9:00 -10:30 AM, Astor Ballroom I & II

Chair: **Frank van Breukelen. Univ. of Nevada**

9:00 AM 2.1 Extreme Physiological Plasticity in a Hibernating Basoendothermic Mammal, *Tenrec Ecaudatus*  
**Frank van Breukelen. Univ. of Nevada**

9:30 AM 2.2 Hibernation and Daily Torpor in *Neotamias Cinereicollis*  
**Ana Fabio Braga. Northern Arizona Univ.**

9:45 AM 2.3 Biologging and Endocrinology: Tools to Understand the Physiological Limits of Free-Living Arctic Ground Squirrels  
**Victor Zhang. Northern Arizona Univ.**

10:00 AM 2.4 Anoxia-Reoxygenation Does Not Alter Mitochondrial Function in Ground Squirrels During Hibernation  
**Leah Hayward. Univ. of Western Ontario**

10:15 AM 2.5 Effects of PH and Temperature on Blood Oxygen Transport in Hibernating and Non-Hibernating Rodents  
**Anne B. Kim. Univ. of British Columbia**

**Oral**

3.0 CARDIOVASCULAR: ABSTRACT DRIVEN SESSION – 1  

Fri., 9:00 -10:30 AM, Astor Ballroom III

Chair: **Todd Gillis. Univ. of Guelph**

9:00 AM 3.1 Powering a Zombie Heart: Metabolic Fuel Utilization in the Excised Hagfish Heart During Anoxia Exposure  
**Todd Gillis. Univ. of Guelph**
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenter</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 AM</td>
<td>3.2</td>
<td>The Functional Significance of Plasma-Accessible Carbonic Anhydrase for Cardiovascular Oxygen Transport in Teleosts</td>
<td>T. S. Harter</td>
<td>Univ. of British Columbia</td>
</tr>
<tr>
<td>9:45 AM</td>
<td>3.3</td>
<td>Convergent Evolution of Reduced Temperature Dependent Hemoglobin-Oxygen Affinity in Regionally Endothermic Fishes</td>
<td>Phillip R. Morrison</td>
<td>Univ. of British Columbia</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>3.4</td>
<td>Hemoglobin Adaptations to High Altitude Augment Arterial O₂ Saturation in Hypoxia but not Aerobic Capacity in Deer Mice (<em>Peromyscus Maniculatus</em>)</td>
<td>Oliver Wearing</td>
<td>McMaster Univ.</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>3.5</td>
<td>Cardiac Performance of Juvenile Red Drum (<em>Sciaenops Ocellatus</em>) During Acute Hypoxia and the Effect Following Crude Oil Exposure.</td>
<td>Derek Nelson</td>
<td>Univ. of North Texas</td>
</tr>
<tr>
<td>Oral</td>
<td>4.0</td>
<td>OSMOREGULATION: ABSTRACT DRIVEN SESSION – 1</td>
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<tr>
<td>9:00 AM</td>
<td>4.1</td>
<td>Role of the Aquaporin Gene Family in Conferring Tolerance to Multiple Environmental Stressors in Tardigrades</td>
<td>Ana Lyons</td>
<td>Univ. of California, Berkeley</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>4.2</td>
<td>The Septate Junction Protein Mesh Is Required for the Form and Function of Drosophila Malpighian Tubule</td>
<td>Sima Jonusaite</td>
<td>Univ. of Utah</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>4.3</td>
<td>The Impact of Salt Contaminated Freshwater on the Physiology of the Rectum and Malpighian Tubules of Mayfly (<em>Hexagenia Rigida</em>) Nymphs</td>
<td>Fargol Nowghani</td>
<td>York Univ.</td>
</tr>
<tr>
<td>9:45 AM</td>
<td>4.4</td>
<td>A Novel Technique for Measuring Hindgut Reabsorption in Drosophila Reveals Adaptive Differences Between Species with Different Thermal Tolerance</td>
<td>Mads Kuhlmann Andersen</td>
<td>Aarhus Univ.</td>
</tr>
<tr>
<td>Oral</td>
<td>5.0</td>
<td>DEVELOPMENTAL PHYSIOLOGY: ABSTRACT DRIVEN SESSION</td>
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<tr>
<td>9:00 AM</td>
<td>5.1</td>
<td>Cortisol and Estrogenic Compounds Modulate Insulin-Like Growth-Factor Binding Protein Gene Expression During Vulnerable Life Stages of Atlantic Salmon</td>
<td>Jason Breves</td>
<td>Skidmore College</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>5.2</td>
<td>Intestinal Hydrolase Transcriptional Responses During Rapid Diet Adjustment in Nestling House Sparrows (<em>Passer Domesticus</em>)</td>
<td>William Karasov</td>
<td>Univ. of Wisconsin-Madison</td>
</tr>
</tbody>
</table>
9:45 AM   5.3  Developmental Variation in Embryos of Two Killifish Populations
          Lindsey Daniel.  Univ. of North Texas

10:00 AM   5.4  Transgenerational Epigenetic Inheritance Induced by the Combined Exposure to Crude Oil and Hypoxia in the Zebrafish
          Naim Martinez.  Univ. of North Texas

10:15 AM   5.5  Hypoxic Incubation Has No Effect on Permeabilized Cardiac Muscle Mitochondrial Oxygen Flux or ROS Production in the American Alligator
          Edward Dzialowski.  Univ. of North Texas

10:30 AM  COFFEE BREAK

Oral
6.0  CONNECTING GENOMES TO PHENOMES TO POPULATIONS
COSPONSORED BY THE AMERICAN PHYSIOLOGICAL SOCIETY AND THE SOCIETY OF INTEGRATIVE AND COMPARATIVE BIOLOGY DIVISION OF COMPARATIVE PHYSIOLOGY AND BIOCHEMISTRY

Fri., 11:00 AM -1:00 PM, Astor Ballroom I & II
Chair: Allyson Hindle.  Massachusetts General Hospital

11:00 AM   6.1  Sex Dependent Phenological Plasticity in an Arctic Hibernator
          C. Loren Buck.  Northern Arizona Univ.

11:30 AM   6.2  Insights Into Mutational Pathways of Biochemical Adaptation Using Ancestral Protein Resurrection
          Jay Storz.  Univ. of Nebraska

12:00 PM   6.3  The Genomic and Physiological Basis of Rapid Adaptation to Temperature in a Globally Invasive Crab
          Carolyn Tepolt.  Woods Hole Oceanographic Institution

12:30 PM   6.4  Modeling Photoperiodism in Subterranean Rodents
          Gisele Oda.  Universidade de São Paulo, Instituto de Biociências

Oral
7.0  VERTEBRATE ENERGETICS: ABSTRACT DRIVEN SESSION

Fri., 11:00 AM-12:30 PM, St. Charles Ballroom
Chair: Matthew Pamenter.  Univ. of Ottawa

11:00 AM   7.1  Digging Up the Evolutionary Origins of Hypoxia-Tolerance: Physiological Adaptations to Acute Hypoxia in 9 Species of African Mole Rats
          Matthew Pamenter.  Univ. of Ottawa

11:30 AM   7.2  Hummingbird Daily Energy Expenditure Allometry: Is Bigger Better?
          Anusha Shankar.  Stony Brook Univ.

12:00 PM   7.3  The Cost of Good Parenting: Altered Maternal Care in High Altitude Deer Mice, Peromyscus Maniculatus
          Cayleih Robertson.  McMaster University
12:15 PM    7.4  Colonizing High Altitude Hypoxic Environments: Strategies to Deal with Metabolic Needs
            Christian Arias-Reyes. Institut universitaire de cardiologie et de pneumologie de Québec, Centre
            Hospitalier Universitaire de Québec (CHUQ), Faculty of Medicine, Université Laval

Oral  8.0  VENTILATORY FUNCTION: ABSTRACT DRIVEN SESSION

Fri., 11:00 AM-1:00 PM, Toulouse A & B

Chair:  Mark Bayley. Aarhus Univ.

11:00 AM    8.1  Learning to Air Breathe; the First Steps
                Mark Bayley. Aarhus Univ.

11:30 AM    8.2  Characterizing the Branchial Hypercarbia Recovery Mechanisms Following Extreme
                Hypercapnia in the Highly CO₂ Tolerant Hagfish
                Greg Goss. Univ. of Alberta

12:00 PM    8.3  Developmental Changes in the Ventilatory Response to CO₂ in Semi-Fossorial Mammals
                Ryan Sprenger. Univ. of British Columbia

12:15 PM    8.4  Haemoglobin Adaptations to High Altitude Alter Breathing Pattern in Deer Mice (Peromyscus
                Maniculatus)
                Catherine Ivy. McMaster Univ.

12:30 PM    8.5  The Effect of Chronic Hypercapnic Incubation on Breathing Patterns in American Alligator
                (Alligator Mississipiensis)
                Justin Conner. Univ. of North Texas

12:45 PM    8.6  Effects of Gravidity on Grasshopper Oxygen Delivery
                Scott Kirkton. Union College

Oral  9.0  THERMAL BIOLOGY: ABSTRACT DRIVEN SESSION -1

Fri., 11:00 AM-12:45 PM, Astor Ballroom III

Chair:  John VandenBrooks. Midwestern Univ.

11:00 AM    9.1  Oxygen Limitation of Thermal Tolerance Varies Depending on the Life Stage and Behavior of
                Terrestrial Organisms
                John VandenBrooks. Midwestern Univ.

11:30 AM    9.2  Ultra-Violet B Radiation, the Often Neglected Ubiquitous Environmental Stressor in Aquatic
                Environments
                Craig Franklin. The Univ. of Queensland

12:00 PM    9.3  Understanding the Effects of Food Availability, Thermal Tolerance, and Sirtuin Activity on the
                Feeding Physiology of Mytilus Californianus
                Melissa May. California Polytechnic State Univ.

12:15 PM    9.4  A Distal Bat Wing Muscle Operates at Low Temperature in Vivo, and Has Low Thermal Sensitivity
                of Contractile Properties
                Andrea Rummel. Brown Univ.
12:30 PM  9.5  Assessing Summertime Thermoregulatory Properties Across the Pelage Molt in a Polar Pinniped: The Weddell Seal
Skyla Walcott. Univ. of Alaska, Anchorage

1:00 PM  LUNCH ON YOUR OWN

10.0  CANCELED

Concurrent

11.0  COMPARATIVE INSIGHTS INTO ANIMAL RESPONSES TO HYPOXIA AND ANOXIA
Fri., 2:00 – 4:00 PM, Astor Ballroom I & II
Chair: Jon Harrison. Arizona State Univ.

2:00 PM  11.1  Role of the Mitochondrion in Low Oxygen Signalling in the Painted Turtle.
Leslie Buck. Univ. of Toronto

2:30 PM  11.2  Re-Oxygenation Resilience - The Other Aspect of the Crucian Carp’s Anoxia Tolerance
Sjannie Lefevre. Univ. of Oslo

3:00 PM  11.3  Learning from the Experts: How Marine and Freshwater Bivalves Cope with Anoxic Transgression
Doris Abele. Alfred Wegener Institute for Polar and Marine Research

3:30 PM  11.4  Flies Are Not Turtles or Carp: Non-Conventional Anoxia Tolerance
Jacob Campbell. USDA-ARS

Concurrent

12.0  MICRORNAS IN COMPARATIVE AND EVOLUTIONARY PHYSIOLOGY
Fri., 2:00 – 4:00 PM, St. Charles Ballroom
Chair: Julie Reynolds. Ohio State Univ.

2:00 PM  12.1  For Everything There Is a Season: MicroRNA Regulation of Insect Diapause
Julie Reynolds. Ohio State Univ.

2:15 PM  12.2  The Role of MiRNA Regulation on Phenotypic Responses to Environmental Stressors in Fish
Paul Craig. Univ. of Waterloo

2:30 PM  12.3  A Cool Story: Non-Coding RNAs in Natural Models of Cold Adaptation
Pier Jr Morin. Université de Moncton

3:00 PM  12.4  Regulation of MicroRNA Activity to Promote Multipotent Cell Fate During Dauer Diapause
Xantha Karp. Central Michigan Univ.

3:30 PM  12.5  A Network of MicroRNAs and RNA Binding Proteins Acts Maternally to Regulate Sex Determination in the C. Elegans Embryo
Katherine McJunkin. National Institutes of Health

Concurrent

13.0  THE ROLE OF GASOTRANSMITTERS IN HYPOXIC AND CHALLENGING ENVIRONMENTS
Fri., 2:00 – 4:00 PM, Toulouse A & B
Chair: Michael Tift. Univ. of California, San Diego
<table>
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<tr>
<td>2:00 PM</td>
<td>13.1</td>
<td>Introduction to Gasotransmitters and the Role of Carbon Monoxide (CO) in Hypoxia-Tolerant Species</td>
<td>Anthony Signore. Univ. of Nebraska, Lincoln</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>13.2</td>
<td>Roles of NO and H$_2$S Signaling in Hibernators</td>
<td>Angela Fago. Aarhus Univ.</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>13.3</td>
<td>Carbon Monoxide Signaling in the Control of Breathing and Impacts for High-Altitude Adaptation</td>
<td>Erica Heinrich. Univ. of California, San Diego</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>13.4</td>
<td>Hydrogen Sulfide and Oxygen Sensing: From Evolution to Function</td>
<td>Kenneth Olson. Indiana U Sch Medicine South Bend</td>
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**Concurrent**

**14.0**

THE ROLE OF THERMAL PERFORMANCE CURVES IN PHYSIOLOGY, ECOLOGY AND CONSERVATION

SPONSORED BY THE SOCIETY OF EXPERIMENTAL BIOLOGY

Fri., 2:00 – 4:00 PM, Astor Ballroom III

**Chair:** Johannes Overgaard. Aarhus Univ.

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<tr>
<td>2:00 PM</td>
<td>14.1</td>
<td>The Thermal Performance Curve: Mechanisms, Applications, and Pitfalls for a Concept that Just Turned 40 (Happy Birthday!)</td>
<td>Michael Angilletta. Arizona State Univ.</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>14.2</td>
<td>Translating Physiology to Fitness Using Thermal Performance Curves</td>
<td>Timothy Clark. Deakin Univ.</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>14.3</td>
<td>Assessing the Role of Acclimation and Adaptation in Thermal Performance Curves</td>
<td>Johannes Overgaard. Aarhus Univ.</td>
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**Poster**

**15.0**

POSTER SESSION 1: ODD NUMBERED POSTER PRESENTATIONS

Fri., 4:00 – 6:00 PM, Grand Ballroom

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<th>Session</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>1</td>
<td>15.1</td>
<td>Mapping Key-Words in Our Journal to Predict the Future of Comparative Physiology</td>
<td>Tobias Wang, Jens Peter Andersen, Flemming Skov. Aarhus Univ.</td>
</tr>
<tr>
<td>3</td>
<td>15.2</td>
<td>Mechanisms Underlying Forelimb Vs. Hindlimb Function During Terrestrial Locomotion in Juvenile Alligators</td>
<td>Adrien A. Arias, Emanuel Azizi. Univ. of California, Irvine</td>
</tr>
<tr>
<td>5</td>
<td>15.3</td>
<td>Effect of PIT Tagging on Aerobic Metabolism and Growth of the Gulf Killifish, Fundulus Grandis</td>
<td>Jessica Reemeyer, Brennalyn LeMaire, Bernard Rees. Univ. of New Orleans</td>
</tr>
<tr>
<td>7</td>
<td>15.4</td>
<td>The Effects of Body Mass on Immune Cell Concentrations of Terrestrial Mammals</td>
<td>Cynthia Downs, Ned Dochtermann, Ray Ball, Kirk Klasing, Lynn Martin. Hamilton College; North Dakota State Univ.; Zoo Tampa; Univ. of California, Davis; Univ. of South Florida</td>
</tr>
</tbody>
</table>
11 15.5 Sequence Analysis, Expression, and Preliminary Functional Characterization of Aedes Aegypti Sodium-Dependent Cation-Chloride Cotransporters
Christopher M. Gillen, Grace F. Riley, John C. Crow, Adrienne C. DeBrosse, Mary E. Sawyer, Megha Kalsi, Peter M. Piermarini. Kenyon College; The Ohio State Univ.

11 15.6 Hypoxia Avoidance Behavior in Two Air-Breathing Fishes
Corey Jew. Univ. of California Irvine

13 15.7 Parasitic Infection-Associated Resemblance Between Locomotor Muscles of Dragonflies and Obese Vertebrates
Rudolf Schilder. Penn State Univ.

15 15.8 Beneficial Effects of Fluctuating Thermal Regimes in the Alfalfa Leafcutting Bee, Megachile Rotundata
Kendra Greenlee, George Yocum, Joseph Rinehart, Julia Bowsher. North Dakota State Univ.; USDA-ARS Red River Valley Agricultural Research Center

17 15.9 Intraspecific Variation in Thermal, Hypoxia and Acute High PH Tolerance in Rainbow Trout
Nicholas Strowbridge, Patricia Schulte. Univ. of British Columbia

19 15.10 Adenosine A1 Receptor Agonist-Induced Hibernation: Effects of Agonist and Seasons on Neuronal Pathways
Carla Frare, Mackenzie Jenkins, Kelly Drew. Univ. of Alaska, Fairbanks

21 15.11 Characterization of the HIF-1 Pathway in Response to an Acute Heat Stress in Antarctic Notothenioid Fishes
Anna Rix, Kristin O’Brien. Univ. of Alaska, Fairbanks

23 15.12 Variation in Thermoregulation and Linking Whole Organism Behavior to Thermosensory Neurophysiology in the Porcelain Crab, Petrolisthes Cinctipes
Emily Lam, Alex Gunderson, Brian Tsukimura, Jonathon Stillman. Univ. of California, Berkeley; Tulane Univ.; California State Univ., Fresno; San Francisco State Univ.

25 15.13 Bone Composition of an Elite Mammalian Diver, the Weddell Seal: Implications for the Use of Bone as a Buffer
Katrina Theiss, Allyson Hindle, Daniel Warren. St. Louis Univ.; Massachusetts General Hospital, Harvard Medical School

27 15.14 Identification and Characterization of a Sodium/Hydrogen Exchanger in Coral: A Potential Role in Biomineralization
Amanda Clark, Abby Beatty, Tonia Schwartz. Auburn Univ.

29 15.15 Cortisol Mediates Claudin-28b Abundance and Its Contribution to Model Gill Epithelium Barrier Properties Via the Mineralocorticoid Receptor
Dennis Kolosov, Scott Kelly. York Univ.

31 15.16 Osmotic Activation of Motility and Expression of Aquaporin Proteins in Sperm from the Gray Treefrog Dryophytes Chrysoscelis
Deja Miller, David Goldstein, James Frisbie. Wright State Univ.

33 15.17 Does the Capacity for Seasonal Plasticity Differ Between Aquatic and Terrestrial Life-History Stages in the Eastern Newt (Notophthalmus Viridescens)?
Patrick Mineo, Roxanne Siuda. Elmhurst College
15.18 Plastic Plasticity: Phenotypic Plasticity at One Time Scale Changes Plasticity at Another Time Scale in Tigriopus Californicus
Timothy Healy, Ronald Burton. Univ. of California San Diego

15.19 Diversification of Characteristics Related to Endothermy in Thunnus Tunas
Barbara Block, Adam Ciezarek, Owen Osborne, Oliver N. Shipley, Edward J. Brooks, Sean Tracey, Jaime McAllister, Luke Gardner, Michael J.E. Sternberg, Vincent Savolainen. Stanford Univ.; Imperial College London; The Cape Eleuthera Institute; Univ. of Tasmania

15.20 Hypoxia-Induced Oxidative Stress in Fundulid Killifish
Ryan Hoffman, Brittney Borowiec, Chelsea Hess, Graham Scott, Fernando Galvez. Louisiana State Univ.; McMaster Univ.

15.21 Integration of Endocrinology, Behavior and Body Temperature of the South-American Tegu Lizard Salvator Merianae
Lucas Zena, Danielle Dillon, Kathleen Hunt, Carlos Navas, Kênia Bícego, C. Loren Buck. Northern Arizona Univ.; Univ. of São Paulo

15.22 Hot and Dry: Effects of Heat Waves and Water Limitation on Metabolic and Evaporative Water Loss Rates
Jordan Glass, Sugjit Singh, Zachary Stahlschmidt. Univ. of the Pacific

15.23 Skeletal Muscle Thermoregulation and Metabolic Control in Hibernating Arctic Ground Squirrels
Moriah Hunstiger, Jishnu Krishnan, Jace Rogers, S. Ryan Oliver. Univ. of Alaska, Fairbanks

15.24 Fat to the High-Altitude Fire: Thermoregulation in Deer Mice
Sulayman Lyons, Grant McClelland. McMaster Univ.

15.25 Modeling Energy Use of Overwintering Hatchling Turtles Using Over a Decade of Nest Temperatures
Tim Muir, Dat Tran, Lawrence Catalan, Marguerite Bednarek, Andrew Sward. Augustana College

15.26 Regulation of Muscle Pyruvate Dehydrogenase in High Altitude Deer Mice
Soren Coulson, Grant McClelland. McMaster Univ.

15.27 d-Amphetamine Exposure to Early Embryonic Zebrafish Reveal Neural and Developmental Consequences
Lisa Ganser, Brad Serpa, Jenn Bullard. Kennesaw State Univ.

15.28 Developmental Oxygen Preconditions Cardiovascular Response to Acute Hypoxic Exposure and Maximal B-Adrenergic Stimulation of Anesthetized Juvenile American Alligators (Alligator Mississippiensis)
Brandt Smith, Janna Crossley, Ruth Elsey, James Hicks, Dane Crossley. Univ. of North Texas; Louisiana Wildlife & Fisheries; Univ. of California, Irvine

15.29 Chronic Crude Oil Exposure Affects Physiology and Sexual Differentiation to Zebrafish (Danio Rerio)
Karem Vazquez Roman, Naim Bautista, Amelie Crespel, Warren Burggren. Univ. of North Texas; Univ. of Glasgow

15.30 Development and Characterization of a Primary Cultured Model of the Larval Sea Lamprey (Petromyzon Marinus) Gills
DAILY SCHEDULE

63  15.32  Participation of Orexin Receptor-1 in the Modulation of Respiratory Motor Activity in the Bullfrog (*Lithobates Cathebeianus*)

*Elisa Fonseca, Tara Janes, Stéphanie Fournier, Luciane Gargaglioni, Richard Kinkead*.  Laval Univ. - Centre de Recherche de l’Institut Universitaire De Cardiologie et Pneumologie de Québec; Univ. of São Paulo State

65  15.33  Does the Spotted Gar, Lepisosteus Oculatus, Express a Functional Endothelial Nitric Oxide Synthase?

*Melissa Cameron, Shigehiro Karaku, Susumu Hyodo, John Donald*.  The Univ. of Sydney; RIKEN Center for Biosystems Dynamics Research (BDR); The Univ. of Tokyo; Deakin Univ.

67  15.34  Toxicity of Crude Oil Extracts in Chicken Embryos

*Lara Amaral-Silva, Maria Rojas-Antich, Benjamin Dubanski, Hiroshi Tazawa, Warren Burggren*.  Univ. of North Texas

69  15.35  Cardiac Proteome Changes in the Western Painted Turtle in Response to Cold Acclimation and Anoxia

*Claire Riggs, Daniel Warren*.  Saint Louis Univ.

71  15.36  Biotinylation of Elephant Seal Blood to Determine RBC Lifespan and Total Blood Volume

*Robby Boparai, Christina Blau, Daniel Crocker, Judy St. Leger, Todd Schmitt, Scott Johns, Mark Fuster, Tatum Simonson, Michael Tift*.  Univ. of California, San Diego; Sonoma State Univ.; Seaworld

73  15.37  Linking Genotypes to Phenotypes Reveals the Underlying Mechanisms of Intestinal Brushborder Remodeling in Snakes

*Stephen Secor, Blair Perry, Todd Castoe*.  Univ. of Alabama; Univ. of Texas, Arlington

75  15.38  Rapid Evolution of Starvation Resistance in Drosophila: Physiological and Molecular Mechanisms

*Austin J. McKenna, Alaric Smith, Allen G. Gibbs*.  Univ. of Nevada, Las Vegas

77  15.39  Testing the Functional Consequences of Genetic Variation in Insulin-Like Growth Factor 1 (IGF1) in Lizards Via Primary Culture Experiments

*Amanda Clark, Abby Beatty, Tonia Schwartz*.  Auburn Univ.

79  15.40  Modelling Human APOL 1 Variant Related Kidney Dysfunction in Guinea Pigs

*Kolawole Ajiboye, William Nabofa*.  Babcock Univ.

81  15.41  Metabolomic Profiles Reveal That Upregulation of Protein Degradation and Nicotinamide Pathways Are Linked with Successful Pregnancy in Weddell Seals

*Michelle Shero, Amy Kirkham, Gregg Adams, Robert McCorkell, Jennifer Burns*.  Woods Hole Oceanographic Institution; Univ. of Alaska Anchorage; Univ. of Saskatchewan; Univ. of Calgary

83  15.42  Evolution of Thermal Tolerance in Pumpkinseed Sunfish (*Lepomis Gibbosus*)

*Brittney Borowiec, Reem Hashem, Derek Campos, Anna Rooke, Michael Fox, Vera Almeida-Val, Graham Scott*.  McMaster Univ.; National Institute for Research of the Amazon; Trent Univ.

85  15.43  Calcium Transport Across the Placenta in a Placentotrophic Lizard: New Insights About Gestation

*Yurany Nathaly Hernández Díaz, Francisca Leal, Martha Patricia Ramírez-Pinila*.  Universidad Industrial de Santander; Univ. of Florida

87  15.44  A Role for Kisspeptin Receptor in the Pituitary Gonadotroph in Male Mice

*Olubusayo Awe, Yaping Ma, Sheng Wu, Andrew Wolfe*.  Johns Hopkins School of Medicine
### DAILY SCHEDULE

**SATURDAY, OCTOBER 27TH, 2018**

#### Oral 16.0

**HIBERNATION AND DAILY TORPOR: ABSTRACT DRIVEN SESSION − 2**

- **Sat., 9:00-10:30 AM, Astor Ballroom I & II**
  - **Chair:** Sylvain Giroud. *Univ. of Veterinary Medicine Vienna*
  
  - **9:00 AM 16.1** The Effect of Lipids on Hibernation and Cardiac Function
    - **Sylvain Giroud. Univ. of Veterinary Medicine Vienna**
  
  - **9:30 AM 16.2** A Systems Level Approach Reveals Incomplete Caspase Cascade Function During Mammalian Hibernation
    - **Michael Treat. Univ. of Nevada**
  
  - **9:45 AM 16.3** Changes in Protein Phosphorylation and Acetylation Correspond with Suppression of Mitochondrial Metabolism During Mammalian Hibernation
    - **Katherine Mathers. Univ. of Western Ontario**
  
  - **10:00 AM 16.4** Perineuronal Nets Cover Parvalbumin-Positive Neurons in Ground Squirrel Cerebral Cortex
    - **Christine Schwartz. Univ. of Wisconsin-La Crosse**
  
  - **10:15 AM 16.5** The Impacts of Snow Cover Variation Across Elevation on Overwintering Montane Insects
    - **Kevin T. Roberts. Univ. of California, Berkeley**

#### Oral 17.0

**MITOCHONDRIAL BIOLOGY: ABSTRACT DRIVEN SESSION**

- **Sat., 9:00-10:30 AM, Toulouse A & B**
  - **Chair:** Daniel Munro. *Univ. of Ottawa*
  
  - **9:00 AM 17.1** Digging Up the Mitochondrial Origins of Hypoxia-Tolerance in African Mole Rats
    - **Daniel Munro. Univ. of Ottawa**
  
  - **9:30 AM 17.2** A Comparative Analysis of Mitochondrial Supercomplexes in Vertebrates
    - **Amanda Bundgaard. Aarhus Univ.**
  
  - **9:45 AM 17.3** The Influence of Thyroid Hormone Manipulation on Cardiac Muscle Mitochondrial Function in Developing Chickens
    - **Jessica Rippamonti. Univ. of North Texas**
  
  - **10:00 AM 17.4** Metabolic Underpinnings of Life History Allocations: Mitochondrial Function Is Fine-Tuned to Meet Divergent Energetic Demands in Two Species of Wing-Polymorphic Crickets
    - **Lisa A. Treidel. Univ. of California, Berkeley**
  
  - **10:15 AM 17.5** Cellular Metabolism and Oxidative Stress as a Possible Determinant for Longevity in Small Breed and Large Breed Dogs
    - **Ana Jimenez. Colgate Univ.**

#### Oral 18.0

**OMIC RESPONSES TO STRESS: ABSTRACT DRIVEN SESSION**

- **Sat., 9:00-10:30 AM, St. Charles Ballroom**
  - **Chair:** Wes Dowd. *Washington State Univ.*
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<th>Institution</th>
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<tbody>
<tr>
<td>9:00 AM</td>
<td>18.1</td>
<td>Physiological Mean-Variance Relationships Among Intertidal Mussels Depend on Environmental Context</td>
<td>Wes Dowd</td>
<td>Washington State Univ.</td>
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<tr>
<td>9:30 AM</td>
<td>18.2</td>
<td>Transcriptomic Responses to Low Salinity Among Locally Adapted Populations of Olympia Oyster, an Estuarine Foundation Species</td>
<td>Tyler Evans</td>
<td>California State Univ. East Bay</td>
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<tr>
<td>9:45 AM</td>
<td>18.3</td>
<td>Unexpected Natural Modification of Mt-DNA Alters Centenarian Bivalve Physiology and Ecology</td>
<td>Doris Abele</td>
<td>Alfred Wegener Institute for Polar and Marine Research</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>18.4</td>
<td>Integrating the Effects of Food Availability and Sirtuins on Stress Tolerance to Multiple Levels of Biological Organization</td>
<td>Lars Tomanek</td>
<td>California Polytechnic State Univ.</td>
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**Oral**

**19.0** ENERGETICS: ABSTRACT DRIVEN SESSION

Sat., 9:00-10:30 AM, Astor Ballroom III

Chair: Timothy Healy. Univ. of California San Diego

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<tr>
<td>9:00 AM</td>
<td>19.1</td>
<td>Polygenic Mapping Reveals Genetic Associations with Variation in Routine Metabolic Rate in Fundulus Heteroclitus</td>
<td>Timothy Healy</td>
<td>Univ. of California San Diego</td>
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<tr>
<td>9:30 AM</td>
<td>19.2</td>
<td>Evolutionary Variation in Hypoxia Tolerance in Fundulidae Killifishes</td>
<td>Brittney Borowiec</td>
<td>McMaster Univ.</td>
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<tr>
<td>9:45 AM</td>
<td>19.3</td>
<td>Protein Turnover: A Biochemical Basis for Endogenous Variation in Growth and Energy Metabolism</td>
<td>Scott L. Applebaum</td>
<td>Univ. of Southern California</td>
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<tr>
<td>10:00 AM</td>
<td>19.4</td>
<td>Bioenergetics of Protein Metabolism Under Experimental Environmental Change</td>
<td>Francis Pan</td>
<td>Univ. of Southern California</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>19.5</td>
<td>Dietary Antioxidants and Flight Exercise Affect the Extent to Which Antioxidants are Delivered to the Mitochondria and How Female Birds Allocate Nutrients to Eggs</td>
<td>Scott McWilliams</td>
<td>Univ. of Rhode Island</td>
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<td>10:30 AM</td>
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<td>COFFEE BREAK</td>
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**Concurrent**

**20.0** EVOLUTION OF PHENOTYPIC PLASTICITY IN PHYSIOLOGICAL SYSTEMS

SPONSORED BY THE SOCIETY OF INTEGRATIVE AND COMPARATIVE BIOLOGY DIVISION OF COMPARATIVE PHYSIOLOGY AND BIOCHEMISTRY

Sat., 11:00 AM-1:00 PM, Astor Ballroom I & II

Chair: Graham Scott. McMaster Univ.
Anne Dalziel. Université Laval
11:00 AM 20.1 Mechanisms Underlying Thermal Acclimation and Their Evolution
Frank Seebacher. Univ. of Sydney

11:30 AM 20.2 Evolution of the Acclimation Responses to Hypoxia and Cold in Deer Mice Native to High Altitudes
Graham Scott. McMaster Univ.

12:00 PM 20.3 Cold Adaptation Drives Evolution of Metabolic Plasticity in Drosophila Melanogaster
Caroline Williams. Univ. of California, Berkeley

12:30 PM 20.4 Evolution of Osmoregulatory Flexibility During Transitions Between Marine and Freshwater Habitats in Fishes
Andrew Whitehead. Univ. of California Davis

Oral 21.0 CARDIOVASCULAR: ABSTRACT DRIVEN SESSION – 2

Sat., 11:00 AM-1:00 PM, Astor Ballroom III

Chair: Hans Malte. Aarhus Univ.

11:00 AM 21.1 Assessing the Full Significance of the Bohr/Haldane Effect for Gas Exchange in the Tissues
Hans Malte. Aarhus Univ.

11:30 AM 21.2 Weddell Seals Selectively Limit Guanylyl Cyclase-Mediated Vasodilation: Implications for Perfusion of the Brain During Diving
Allyson Hindle. Massachusetts General Hospital

12:00 PM 21.3 Developmental Differences in Anoxia-Induced Gene Expression in the Heart of the Painted Turtle
Cornelia Fanter. Saint Louis Univ.

12:15 PM 21.4 The Influence of Cellular Stretch on Extracellular Connective Tissue Deposition in Cultured Trout Cardiac Fibroblasts
Elizabeth Johnston. Univ. of Guelph

12:30 PM 21.5 Re-Assessment of the Biochemistry of Metabolic Acidosis Using Metabolite and Reaction H^+ Coefficients Computed from Multiple Competitive Cation Binding
Robert Robergs. Queensland Univ. of Technology

Oral 22.0 MAMMALIAN MOLECULAR PHYSIOLOGY: ABSTRACT DRIVEN SESSION

Sat., 11:00 AM-12:30 PM, Toulouse A & B

Chair: Jane Khudyakov. Univ. of the Pacific

11:00 AM 22.1 Obesity-Related Gene Expression During Fasting in a Naturally Obese Marine Mammal
Jane Khudyakov. Univ. of the Pacific

11:30 AM 22.2 The Weddell Seal Skin Transcriptome Reflects Local Mechanisms in Endocrine Regulation of Molt
Amy Kirkham. Univ. of Alaska, Fairbanks

12:00 PM 22.3 Development of a Biomarker Panel of Chronic Stress in Free-Ranging Marine Mammals
Laura Pujade Busqueta. Univ. of the Pacific
DAILY SCHEDULE

Jenna Monroy. Claremont Colleges

Oral
23.0 THERMAL BIOLOGY: ABSTRACT DRIVEN SESSION – 2

Sat., 11:00 AM-1:00 PM, St. Charles Ballroom

Chair: Suzanne Currie. Acadia Univ.

11:00 AM 23.1 Social Cues Can Push Amphibious Fish to Their Thermal Limits
Suzanne Currie. Acadia Univ.

11:30 AM 23.2 Developmental Changes in Oxygen Consumption and Hypoxia Tolerance in the Heat- and Hypoxia-Adapted Tabasco Line of the Nile Tilapia (Oreochromis Niloticus)
Warren Burggren. Univ. of North Texas

12:15 PM 23.4 Acute Thermal Tolerance, Not Hypoxia Tolerance, Affects the Temperature Sensitivity of Hypoxia Tolerance in Marine Fishes
Derek Somo. The Univ. of British Columbia

12:30 PM 23.5 Critical Windows in Rainbow Trout Embryos: Effects of Thermal Shifts on Survival, Growth and Oxygen Consumption
Christopher Melendez. California State Univ. San Marcos

1:00 PM LUNCH ON YOUR OWN

Concurrent
24.0 COMPARATIVE ASPECTS OF ACID-BASE REGULATION

Sat., 2:00 – 4:00 PM, St. Charles Ballroom

Chair: Colin Brauner. Univ. of British Columbia

2:00 PM 24.1 Evolutionary Patterns of Acid-Base Regulation in Vertebrates
Colin Brauner. Univ. of British Columbia

2:30 PM 24.2 Evolutionarily Conserved Mechanisms for Acid-Base Sensing
Martin Tresguerres. Univ. of California San Diego

3:00 PM 24.3 Bicarbonate-Sensing Soluble Adenylyl Cyclase in Fishes
Jinae Roa. Univ. of British Columbia

3:30 PM 24.4 The Alkaline Tide: Acid-Base Regulation During Digestion
Tobias Wang. Aarhus Univ.

Concurrent
25.0 EVOLUTION OF METABOLIC PROTEINS

Sat., 2:00 – 4:00 PM, Astor Ballroom III

Chairs: Chris Moyes. Queen’s Univ.
Jeffrey Richards. Univ. of British Columbia
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<td>2:00 PM</td>
<td>25.1</td>
<td>Molecular Evolution of Cytochrome C Oxidase in Hypoxia Tolerant Fish</td>
<td>Gigi Lau</td>
<td>Univ. of Oslo</td>
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<td>2:30 PM</td>
<td>25.2</td>
<td>Function and Evolution of Cellulase and Hemicellulase Enzymes Within Invertebrates That Do Not Consume Significant Amounts of Plant Cellulose</td>
<td>Stuart Linton</td>
<td>Deakin Univ.</td>
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<tr>
<td>3:00 PM</td>
<td>25.3</td>
<td>Evolutionary Phylogenomics of UCP1 and Sarcolipin: Key Players Underlying Adaptive Thermogenesis Across Eutheria?</td>
<td>Kevin L. Campbell</td>
<td>Univ. of Manitoba</td>
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<tr>
<td>3:30 PM</td>
<td>25.4</td>
<td>Evolution of Metabolic Proteins: Pyruvate Dehydrogenase in Anaerobiosis</td>
<td>Michael Berenbrink</td>
<td>Liverpool Univ.</td>
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</table>

**Concurrent 26.0**

**HARNESSING NATURALLY EVOLVED TORPOR TO BENEFIT HUMAN SPACEFLIGHT**

**CO-SPONSORED BY THE SOCIETY OF EXPERIMENTAL BIOLOGY**

Sat., 2:00 – 4:00 PM, Astor Ballroom I & II

Chairs: Hannah Carey. Univ. of Wisconsin-Madison
        Matthew Regan. Univ. of Wisconsin-Madison

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<tr>
<td>2:00 PM</td>
<td>26.1</td>
<td>Enhancing Metabolic Flexibility in Humans: Insights from Hibernation to Benefit Spaceflight</td>
<td>Hannah V. Carey</td>
<td>Univ. of Wisconsin-Madison</td>
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<tr>
<td>2:30 PM</td>
<td>26.2</td>
<td>Central Mechanisms of Torpor Induction</td>
<td>Matteo Cerri</td>
<td>Univ. of Bologna</td>
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<td>3:00 PM</td>
<td>26.3</td>
<td>The Relationship Between Sleep and Torpor</td>
<td>Vladyslav Vyazovskiy</td>
<td>Univ. of Oxford</td>
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<td>3:30 PM</td>
<td>26.4</td>
<td>The Spaceflight Environment</td>
<td>Jessica Meir</td>
<td>NASA</td>
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**Concurrent 27.0**

**PHYSIOLOGY FROM THE NEOTROPICS: RHYTHMS, TEMPERATURE AND SEASON**

Sat., 2:00 – 4:00 PM, Toulouse A & B

Chairs: Kenia Cardoso-Bicego. Sao Paulo State Univ.
        Luciane Gargaglioni. Sao Paulo State Univ.

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<tr>
<td>2:00 PM</td>
<td>27.1</td>
<td>Seasonal Physiology of a Hibernating and Facultative Endothermic Lizard</td>
<td>Kenia Bicego</td>
<td>Sao Paulo State Univ.</td>
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<tr>
<td>2:30 PM</td>
<td>27.2</td>
<td>Orexin in Ectotherms: Modulatory Role on Ventilation</td>
<td>Luciane H Gargaglioni</td>
<td>Sao Paulo State Univ.</td>
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<tr>
<td>3:00 PM</td>
<td>27.3</td>
<td>Temperature Effects on Cardiorespiratory Function in Amphibians and the Aplication of a Non-Invasive Methodology</td>
<td>Lucas Zena</td>
<td>Univ. of São Paulo</td>
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<tr>
<td>3:30 PM</td>
<td>27.4</td>
<td>Plasticity of 24h Body Temperature Rhythms in a South American Subterranean Rodent</td>
<td>Patricia Tachinardi</td>
<td>Univ. of São Paulo</td>
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<td><strong>POSTER SESSION 2: EVEN NUMBERED POSTER PRESENTATIONS</strong></td>
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<td>Sat., 4:00 – 6:00 PM, Grand Ballroom</td>
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<td><strong>28.1</strong> On the Dynamics of Actomyosin Binding</td>
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<td>Dean Culver. <em>Army Research Laboratory</em></td>
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<td><strong>28.2</strong> Effect of Substrate Compliance on Coordinated Landing in Rhinella Marina</td>
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<td></td>
<td>Alex Duman, Emanuel Azizi. <em>Univ. of California, Irvine</em></td>
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<td>6</td>
<td><strong>28.3</strong> The Interaction of Incompressible Fluid and Extracellular Connective Tissues in Lobster Muscle</td>
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<td></td>
<td>David Sleboda, Caroline Wolek, Thomas Roberts. <em>Brown Univ.</em></td>
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<td>8</td>
<td><strong>28.4</strong> Effects of Passive Integrated Transponder Tagging on Cortisol Release by the Gulf Killfish Fundulus Grandis</td>
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<td>Jasmine Harris, Ariel Hernandez, Bernard Rees. <em>Univ. of New Orleans</em></td>
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<td>10</td>
<td><strong>28.5</strong> On the Role of the Visual and Vestibular Systems in Stabilising Perching in Zebra Finches</td>
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<td></td>
<td>Natalia Perez-Campanero, David Perkel, Graham Taylor. <em>Univ. of Oxford; Univ. of Washington</em></td>
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<td>12</td>
<td><strong>28.6</strong> Research of Development of Adaptive Processes to Psycho-Emotinal Stress in Medical Students</td>
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<td></td>
<td>Larysa Chernobay, Oksana Vasylieva. <em>Kharkiv National Medical Univ.</em></td>
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<td>14</td>
<td><strong>28.7</strong> A Comparison of Thermal Performance Among Latitudinally Separated Populations of the Intertidal Barnacle Balanus Glandula</td>
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<td>Sarah Gilman, Gordon Ober, Rhianon Rognstad, Maddy Bunnennen-Ross, Juanita Man. <em>Scripps College; Claremont McKenna College; Pitzer College</em></td>
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<td><strong>28.8</strong> Active and Passive Energetics of Thermoregulation from Thermoconformity to Partial Thermoregulation</td>
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<td>Adam Parlin, Asgeir Bjarnason, Paul Schaeffer. <em>Miami Univ.; Star Oddi</em></td>
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<td><strong>28.9</strong> Clocks and Meals Keep Mice from Being Cool</td>
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<td>Steven Swoap, Vincent Van der Vinne, Mark Bingaman, David Weaver. <em>Williams College; Univ. of Massachusetts Medical School</em></td>
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<td><strong>28.10</strong> Expression of TRP Channels in Notothenioid Fish</td>
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<td>Julia York, Harold Zakon. <em>Univ. of Texas at Austin</em></td>
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<td>22</td>
<td><strong>28.11</strong> Investigating Changes in Thermal Physiology in Response to a Gut Infection in the Dragonfly, Libellula Pulchella</td>
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<td><strong>28.12</strong> Stage-Specific Oxygen Limitation of Thermal Tolerance in Schistocerca Cancellata</td>
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<td>Jacob P. Youngblood, John M. VandenBrooks, Michael J. Angilletta Jr. <em>Arizona State Univ.; Midwestern Univ</em></td>
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<td><strong>28.13</strong> The Effect of Salinity on Expression of Aquaporins 1 and 5 in the Gastric Caeca of Aedes Aegypti Mosquito Larvae</td>
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<td>Elia Grieco, Lidiya Misyura, Andrew Donini. <em>York Univ.</em></td>
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<td>Identification of the First Member of the Gap Junction Protein Family in the Protozoa</td>
<td>Trypanosoma Cruzi, the Etiological Agent of Chagas Disease</td>
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<td>Juan Güiza, Iván Barria, Francisco Solis, Valeska Molina, Pedro Zamorano, Jorge González,</td>
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<td>Jonathan Canan, Romina Sepulveda, Fernando González-Nil, Juan Carlos Sáez, José Luis Vega.</td>
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<td><em>Antofagasta Univ.; Universidad Andrés Bello; Pontifica Universidad Católica de Chile</em></td>
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<td>28.17</td>
<td>The Effect of Food Availability, Temperature and Sirtuin Inhibition on the Metabolic Rate of</td>
<td>Chessie Cooley-Rieders, Amanda Frazier, Tinh Ton That, Sarah Nancollas, Melissa May, Maria</td>
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<td>California Mussel Gill Tissue</td>
<td>Christina Vasquez, Erin Flynn, Lars Tomanek, Anne Todgham. <em>Univ. of California, Davis; Cal Poly San Luis Obispo; Cal Poly San Luis Obispo.</em></td>
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<td>28.18</td>
<td>The Importance of Tidal Acclimation in Assessing the Physiological Responses of the Intertidal Crab Carcinus Maenas to Emersion</td>
<td>Sarah Nancollas, Iain McGaw. <em>Univ. of California, Davis; Memorial Univ. of Newfoundland</em></td>
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<td>Hypoxia and the Metabolic Phenotype in Daphnia</td>
<td>Kurtis Westbury, William Nelson, Christopher Moyes. <em>Queen’s Univ.</em></td>
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<td>Establishing an Index of Habitat Quality and Reproductive Success for the Northern Fur Seal</td>
<td>Gregory Merrill, Ward Testa, Jennifer Burns. <em>Univ. of Alaska Anchorage; NMFS Alaska Fisheries Science Center</em></td>
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<td>Hypoxia Induces Differential Changes in Thermoregulation and Metabolic Rate Base on Body Size in the Bumblebee Bombus Impatiens</td>
<td>Sara Wilmansen, Edward Dzialowski. <em>Univ. of North Texas</em></td>
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<td>28.22</td>
<td>Does Individual Variation in Heat Loss Influence Thyroid and Metabolic Responses to Cold?</td>
<td>François Vézina, Theunis Piersma, Olivier Chastel. <em>Université du Québec à Rimouski; NIOZ Royal Netherlands Institute for Sea Research; Centre National de la Recherche Scientifique</em></td>
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<td>Evidence for the Influence of Triiodothyronin on Maximal Heat Production in Birds.</td>
<td>Emily Cornelius Ruhs, Theunis Piersma, Olivier Chastel, François Vézina. <em>Université du Québec à Rimouski; NIOZ Royal Netherlands Institute for Sea Research; Centre National de la Recherche Scientifique</em></td>
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<td>28.26</td>
<td>Depressing Mitochondrial Function During Paradoxical Anaerobism Leads to an Alcoholic Fish</td>
<td>Stanley Hillyard, Martin Jastroch , Frank van Breukelen. <em>Univ. of Nevada Las Vegas; Stockholm Univ.; Univ. of Nevada</em></td>
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<td>The Impact of Developmental Hypoxia on the Cardiovascular Chemoreflex in Embryonic Snapping Turtles (Chelydra Serpentina)</td>
<td>Kevin Tate, John Eme, Dane Crossley. <em>Texas Lutheran Univ.; California State Univ. San Marcos; Univ. of North Texas</em></td>
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<td>56</td>
<td>28.28</td>
<td>Scaling of Major Organs in Hatchling Female American Alligators (Alligator Mississipiensis)</td>
<td>John Eme, Cassidy Cooper, Andrew Alvo, Juan Vasquez, Sara Muhtaseb, Thomas Schmoyer, Susan Rayman, Ruth Eley</td>
<td>California State Univ. San Marcos; Louisiana Department of Wildlife and Fisheries</td>
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<td>28.30</td>
<td>Evolution of the Development of Respiratory Physiology in Deer Mice Native to High Altitude</td>
<td>Catherine Ivy, Mary Greaves, Elizabeth Sangster, Graham Scott. McMaster Univ.</td>
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<td>64</td>
<td>28.32</td>
<td>The Effects of a Bacterial Endotoxin LPS: Neuromuscular Junction and Cardiac Function in Fruit Fly (Drosophila Melanogaster) and Blowfly (Phaenicia Sericata) Larvae</td>
<td>Robin Cooper, Micaiah McNabb, Ogechi Anyagaligbo, Abigail Greenhalgh. Univ. of KY.</td>
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<td>66</td>
<td>28.33</td>
<td>Examination of Predicted Cardiac Parameters Based on Ventricle Wall Thickness in the Northern Bobwhite Quail, Colinus Virginianus</td>
<td>Kevin Stewart, Janna Crossley, Brandt Smith, Dane Crossley. Univ. of North Texas</td>
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<tr>
<td>68</td>
<td>28.34</td>
<td>Heart Rate and Angiogenesis in Chicken Embryos Exposed to the Environmental Contaminant TCDD (2,3,7,8-Tetrachlorodibenzo-p-dioxin)</td>
<td>Lara Amaral-Silva, Warren Burggren. Univ. of North Texas</td>
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<td>70</td>
<td>28.35</td>
<td>Baroreflex Changes with Body Size in the Green Iguana</td>
<td>Renato Filogonio, Cléo Leite. Federal Univ. of São Carlos</td>
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<td>72</td>
<td>28.36</td>
<td>Withdrawn</td>
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<td>74</td>
<td>28.37</td>
<td>Changes in the Gut Microbiota Over the Course of Gestation in Oviparous Eastern Fence Lizards (Sceloporus Undulatus)</td>
<td>Brian Trevelline, Kirsty MacLeod, Tracy Langkilde, Kevin Kohl. Univ. of Pittsburgh; The Pennsylvania State Univ.</td>
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<tr>
<td>76</td>
<td>28.38</td>
<td>Comparative Analyses of Gene Expression in Snakes Yields Insight Into Conserved Mechanisms Underlying Intestinal Regeneration</td>
<td>Blair Perry, Stephen Secor, Todd Castoe. Univ. of Texas Arlington; Univ. of Alabama</td>
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<tr>
<td>82</td>
<td>28.41</td>
<td>Hydrogen Sulfide Metabolites in Tissues of Normoxic and Anoxic Freshwater Turtles (Trachemys Scripta)</td>
<td>Birgitte Jensen, Christopher Kevil, Angela Fago. Aarhus Univ.; Louisiana State Univ. Health Sciences Center</td>
<td></td>
</tr>
</tbody>
</table>
84  28.42  Effects of Hind Limb Immobilisation and Castration on $[^3]H$ouabain Binding Site Content and Na$^+$, K$^+$-ATPase Isoform Abundances in Rat Soleus Muscle
Muath Altarawneh. *The Institute for Health and Sport (IHES), Victoria Univ., Melbourne, Australia*

86  28.43  Preliminary Survey of Homeodomains in Lumbriculus Variegatus
Kathy Gillen, Fielding Fischer, Liana Valin. *Kenyon College*

88  28.44  Whole Genome De Novo Sequencing of the Atlantic and Pacific Bluefin Tuna Genomes

**SUNDAY, OCTOBER 28TH, 2018**

**Oral**

29.0  CLINICAL PHYSIOLOGY: ABSTRACT DRIVEN SESSION

Sun., 9:00-10:30 AM, Astor Ballroom III

Chair:  Mirit Eynan. *Israel Naval Medical Institute*

9:00 AM  29.1  Blood Glucose Levels and Hyperbaric Pressure in SOD2 Enzyme Knockdown Mice
Mirit Eynan. *Israel Naval Medical Institute*

9:30 AM  29.2  A Proposed Role for the Mammalian Dive Response in Sudden Unexpected Death in Epilepsy
Jose Vega. *Novant Health, Forsyth Medical Center*

9:45 AM  29.3  A Copmaritive Study of Pulmonary Slowly Adapting Receptors Between Rabbits and Rats
Ping Liu. *Univ. of Louisville*

10:00 AM  29.4  Contribution of Group II Metabotropic Glutamate Receptors in the Dorsal Medullary Neuronal Groups During Hypertension Development
Julia Chu-Ning Hsu. *Graduate School of Agricultural and Life Sciences, The Univ. of Tokyo*

10:15 AM  29.5  The Evolving Cholecystokinin 1 Receptor as a Unique G Protein-Coupled Receptor Permanently Activated by Singlet Oxygen (GPCR-PABSO)
Zong Jie Cui. *Beijing Normal Univ.*

**Oral**

30.0  OSMOREGULATION ION REGULATION: ABSTRACT DRIVEN SESSION – 1

Sun., 9:00-10:30 AM, St. Charles Ballroom

Chair:  Alexander Clifford. *Univ. of Alberta*

9:00 AM  30.1  Going Against the Gradient: Active NH$_4^+$ Excretion by the Ammonia Tolerant Hagfish (*Eptatretus Stoutii*)
Alexander Clifford. *Univ. of Alberta*

9:30 AM  30.2  Ammonia Transporter Expression and Distribution in Organs of Caribbean Subpopulations of the Mosquito, Aedes Aegypti, Collected from Freshwater and High Ammonia Habitats
Andrea Durant. *York Univ.*

9:45 AM  30.3  Potential Role of a Rh Channel in Delivery of Ammonium from Coral Host Cells to Their Endosymbiotic Algae
Angus Thies. *Scripps Institution of Oceanography*
DAILY SCHEDULE

10:00 AM  30.4  The Dual-Purpose Saltwater Mitochondria Rich (MR) Cell of Sea Lampreys (*Petromyzon Marinus*): An Organ of Osmoregulation and Ammonia Homeostasis

10:15 AM  30.5  Impact of Sugar Beet De-Icing Liquid on Salt and Water Balance in Mayfly Nymph, Hexagenia Limbata
   Laura Ana Cuciureanu.  *York Univ.*

Oral

31.0  DIGESTIVE PHYSIOLOGY: ABSTRACT DRIVEN SESSION

   Sun., 9:00-10:30 AM, Astor Ballroom I & II

   Chair:  Matthew Regan,  *Univ. of Wisconsin-Madison*

9:00 AM  31.1  Exploring How a Shifting Gut Microbiome May Influence the Hibernation Phenotype
   Matthew Regan.  *Univ. of Wisconsin-Madison*

9:15 AM  31.2  Unraveling the Complexity of Seasonal Phenotypic Flexibility in Small Birds Via Omics Integration
   Bernard W.M. Wone.  *Univ. of South Dakota*

9:30 AM  31.3  Withdrawn

9:45 AM  31.4  The Role of Microbial Symbionts in Bonnethead Shark Seagrass Digestion
   Samantha Leigh.  *Univ. of California-Irvine*

10:00 AM  31.5  Will Abalone Survive Climate Change? Comparative Digestive Physiology and the Effect of Temperature Stress on Abalone Across the Pacific Ocean
   Alyssa Frederick.  *UC Irvine*

10:15 AM  31.6  Quickly Becoming an Omnivorous Lizard: Interactions of Diet, Physiology, and Ecology Lead to Dynamic Changes in a Rapidly Evolving System
   Beck Wehrle.  *Univ. of California, Irvine*

10:30 AM  COFFEE BREAK

Concurrent

32.0  CONDUCTING MECHANISTIC INVESTIGATIONS IN COMPARATIVE PHYSIOLOGY USING IN VITRO AND EX VIVO SYSTEMS

   Sun., 11:00 AM-1:00 PM, Astor Ballroom I & II

   Chair:  Jose Vazquez-Medina.  *Univ. of California, Berkeley*

11:00 AM  32.1  Induced Pluripotent Stem Cells from 13-Lined Ground Squirrels: To Learn “hibernation” in a Dish?
   Jingxing Ou.  *National Institutes of Health*

11:30 AM  32.2  Molecular Manipulations: The Power of Cell Culture for Defining Mechanisms of Anoxia Tolerance
   Sarah Milton.  *Florida Atlantic Univ.*

12:00 PM  32.3  Identifying Anti-Inflammatory Properties of Serum That Could Protect the Lungs of Deep-Diving Seals
   Allyson Hindle.  *Massachusetts General Hospital*
12:30 PM  32.4  Studying Natural Tolerance to Ischemia/Reperfusion Using Endothelial Cells Derived from Seals  
Kaitlin Allen.  Univ. of California Berkeley

Concurrent
33.0  INTEGRATING PHENOTYPES AND FUNCTIONAL GENOMICS TO UNDERSTAND MECHANISMS OF REMODELING AND GROWTH

Sun., 11:00 AM-1:00 PM, Toulouse A & B

Chairs:  Todd Castoe.  Univ. of Texas Arlington  
Stephen Secor.  Univ. of Alabama

11:00 AM  33.1  A New Perspective from Snakes on Conserved Vertebrate Stress and Growth Pathways Underlying Intestinal Regeneration  
Todd Castoe.  Univ. of Texas Arlington

11:30 AM  33.2  Using Natural Genomic Variation and Experimental Approaches to Understand the Function and Evolution of the Insulin and Insulin-Like Signaling Network in Reptiles  
Tonia Schwartz.  Auburn Univ.

12:00 PM  33.3  Transcriptome Dynamics in Hibernation: Cause or Consequence of Physiology?  
Sandra L. Martin.  Univ. of Colorado School of Medicine

12:30 PM  33.4  Cardiomyocyte Polyploidization Creates a Barrier to Heart Regeneration in Zebrafish  
Juan Manuel González-Rosa.  Harvard Univ.

Oral
34.0  THERMAL BIOLOGY: ABSTRACT DRIVEN SESSION – 3

Sun., 11:00 AM-1:00 PM, Astor Ballroom III

Chair:  Michael Dillon.  Univ. of Wyoming

11:00 AM  34.1  Geographic Variation in Bumblebee Thermal Tolerance: Implications for Past and Future Range Shifts  
Michael Dillon.  Univ. of Wyoming

11:30 AM  34.2  Defying the Temperature Size Rule in Flight: Bigger Bees Perform Better at Higher Temperatures  
Meghan E. Duell.  Arizona State Univ.

11:45 AM  34.3  One for All or All for One: Emergent Thermal Physiology of Ant Colonies Along Tropical Mountain Ranges  
Kaitlin Baudier.  Arizona State Univ.

12:00 PM  34.4  Simultaneous Stress: Effects of Hypoxia-Temperature Interactions on Mortality, Thermal Tolerance, and Transcriptome of Drosophila Melanogaster  
Leigh Boardman.  Univ. of Florida

12:15 PM  34.5  Why Insects Die at Low Temperature: Depolarization Mediated $Ca^{2+}$ Overload Causes Cell Death in Locusta Migratoria  
Jeppe Bayley.  Aarhus Univ.

12:30 PM  34.6  How to Assess Drosophila Heat Tolerance: Unifying Static and Dynamic Tolerance Assays to Predict Heat Distribution Limits  
Lisa Bjerregaard Jørgensen.  Aarhus Univ.
12:45 PM 34.7 Evolution of Body Size Toward Temperature-Dependent Oxygen Conditions in 188 Rotifer Species
Aleksandra Walczynska. Jagiellonian Univ.

Oral
35.0 OSMOREGULATION ION REGULATION: ABSTRACT DRIVEN SESSION – 2

Sun., 11:00 AM-12:30 PM, St. Charles Ballroom

Chair: Carol Bucking. York Univ.

11:00 AM 35.1 The Role of the Pyloric Ceca in Ion Balance in Rainbow Trout: Integrating Across Techniques to Understand Active Calcium Transport
Carol Bucking. York Univ.

11:30 AM 35.2 Cellular Mechanism for Teleost Otolith Calcification, and Their Responses to Acid-Base Disturbances
Garfield Kwan. Scripps Institution of Oceanography

11:45 AM 35.3 No Water, No Problem: A Metabolomics Analysis of Desiccated Annual Killifish Embryos
Daniel Zajic. Portland State Univ.

12:00 PM 35.4 Distinct Ion Transport Properties in Airways of the Marsh Rice Rat (Oryzomys palustris)
Leah Reznikov. Univ. of Florida

1:00 PM LUNCH ON YOUR OWN

Concurrent
36.0 ANIMAL INTESTINAL MICROBIOMES: COMMUNITY DIVERSITY AND SERVICES PROVIDED TO THE HOST

Sun., 2:00 – 4:00 PM, Toulouse A & B

Chairs: Beck Wehrle. Univ. of California, Irvine
Brian Trevelline. Univ. of Pittsburgh

2:00 PM 36.1 It's Not Easy Eating Green: The Importance of the Gut Microbiome in Facilitating Herbivory
Kevin Kohl. Univ. of Pittsburgh

2:30 PM 36.2 The Enteric Microbial Communities of Sharks, Fishes, Island-Dwelling Lizards, and Abalone: Dietary and Phylogenetic Considerations
Donovan German. Univ. of California, Irvine

3:00 PM 36.3 Host Genetic Background Contributes to Resistance to Microbiota Disruption and Host Development in an Evolution Model Organism
Kathryn Milligan-Myhre. Univ. of Alaska, Anchorage

3:30 PM 36.4 Gut Microbial Community Dynamics in Arctic Ground Squirrels: Microbially-Liberated Urea-Nitrogen Use Across the Annual Cycle of Hibernation and Activity
Khrys Duddleston. Univ. of Alaska, Anchorage
Concurrent 37.0 COMPARATIVE PHYSIOMIICS: SYSTEMS-LEVEL APPROACHES TO COMPARATIVE PHYSIOLOGY
SPONSORED BY THE SOCIETY OF INTEGRATIVE AND COMPARATIVE BIOLOGY DIVISION OF COMPARATIVE
PHYSIOLOGY AND BIOCHEMISTRY

Sun., 2:00 – 4:00 PM, Astor Ballroom I & II

Chair: Jane Khudyakov. Univ. of the Pacific

2:00 PM 37.1 Species-Specific Responses of Juvenile Rockfish to Elevated PCO₂ and Hypoxia
Cheryl Logan. California State Univ. Monterey Bay

2:30 PM 37.2 The Role of Small Noncoding RNAs in the Regulation of Metabolic Dormancy and Extreme Stress
Tolerance
Jason Podrabsky. Portland State Univ.

3:00 PM 37.3 Using Proteomics to Investigate Regulation of Stress Tolerance by Sirtuins in Mytilus Mussel
Congeners
M. Christina Vasquez. Loyola Marymount Univ.

3:15 PM 37.4 Metabolic Response to Stress in Marine Mammals
Cory Champagne. National Marine Mammal Foundation

3:30 PM 37.5 From Genome to Phenome: Exploiting 13-Lined Ground Squirrel "Oomics" to Achieve a Deeper
Understanding of Hibernation
Katharine Grabek. Stanford Univ.

Concurrent 38.0 MANAGING FUEL METABOLISM UNDER LIMITED OXYGEN AND ENERGY SUPPLY
SPONSORED BY THE SOCIETY OF INTEGRATIVE AND COMPARATIVE BIOLOGY DIVISION OF COMPARATIVE
PHYSIOLOGY AND BIOCHEMISTRY

Sun., 2:00 – 4:00 PM, Astor Ballroom III

Chair: Jean-Michel Weber. Univ. of Ottawa

2:00 PM 38.1 Metabolic Suppression Mechanisms for Fasting and Hypoxia
Jean-Michel Weber. Univ. of Ottawa

2:30 PM 38.2 Now or Later: Differential Fates for Glucose and Fructose in a Nectarivore
Morag Dick. Univ. of Toronto

3:00 PM 38.3 Feeding the Machine at the Top of the Food Chain: A Carnivore Conundrum
Terrie Williams. Univ. of California - Santa Cruz

3:30 PM 38.4 Fuelling Locomotion and Thermogenesis in High Altitude Native Deer Mice
Grant McClelland. McMaster Univ.

Concurrent 39.0 MECHANISMS OF CHANGE, PHYSIOLOGICAL RESPONSE TO ENVIRONMENTAL STRESSORS
SPONSORED BY THE SOCIETY OF EXPERIMENTAL BIOLOGY

Sun., 2:00 – 4:00 PM, St. Charles Ballroom

Chairs: Sarah Alderman. Univ. of Guelph
Todd Gillis. Univ. of Guelph
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<th>Presenter</th>
<th>Institution</th>
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<tbody>
<tr>
<td>2:00 PM</td>
<td>39.1</td>
<td>Sublethal Effects and Biomarkers of Crude Oil Exposure in Anadromous Fish</td>
<td>Sarah Alderman</td>
<td>Univ. of Guelph</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>39.2</td>
<td>Physiological Responses to Social Stressors</td>
<td>Kathleen Gilmour</td>
<td>Univ. of Ottawa</td>
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<tr>
<td>3:00 PM</td>
<td>39.3</td>
<td>Exploring Thermal Physiology: Effects of Environmental Temperature in Embryonic to Larval Frogs and Juvenile to Adult Copepods</td>
<td>Casey A. Mueller</td>
<td>California State Univ. San Marcos</td>
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<td>3:15 PM</td>
<td>39.4</td>
<td>Effects of Acute and Chronic Thermal Exposure on the Swimming Performance and Aerobic Scope of Sheepshead Minnows (Cyprindon Variegatus)</td>
<td>Amanda Reynolds Kirby</td>
<td>Univ. of North Texas</td>
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<tr>
<td>3:30 PM</td>
<td>39.5</td>
<td>Hypoxia and Ammonia Exposures Have Differential, Developmental-Stage Specific, and Long-Term Consequences on the Stress Response in Zebrafish</td>
<td>Nicholas Bernier</td>
<td>Univ. of Guelph</td>
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**Oral 40.0 SCHOLANDER AWARD ORAL PRESENTATIONS**

Sun., 4:00 – 6:00 PM, St. Charles Ballroom

**Chair:** Lynn Hartzler. *Wright State Univ.*

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<th>Institution</th>
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<tr>
<td>4:00 PM</td>
<td>3.2</td>
<td>The Functional Significance of Plasma-Accessible Carbonic Anhydrase for Cardiovascular Oxygen Transport in Teleosts</td>
<td>T. S. Harter</td>
<td>Univ. of British Columbia (3.2)</td>
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<tr>
<td>4:15 PM</td>
<td>4.2</td>
<td>The Septate Junction Protein Mesh is Required for the Form and Function of Malpighian Tubule</td>
<td>Sima Jonusaite</td>
<td>Univ. of Utah (4.2)</td>
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<tr>
<td>4:30 PM</td>
<td>19.1</td>
<td>Polygenic Mapping Reveals Genetic Associations with Variation in Routine Metabolic Rate in Fundulus Heteroclitus</td>
<td>Timothy Healy</td>
<td>Univ. of California San Diego (19.1)</td>
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<tr>
<td>4:45 PM</td>
<td>17.4</td>
<td>Metabolic Underpinnings of Life History Allocations: Mitochondrial Function is Fine-Tuned to Meet Divergent Energetic Demands in Two Species of Wing-Polymorphic Crickets</td>
<td>Lisa A Treidel</td>
<td>Univ. of California, Berkeley (17.4)</td>
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<tr>
<td>5:00 PM</td>
<td>30.1</td>
<td>Going Against the Gradient: Active NH4 + Excretion by the Ammonia Tolerant Hagfish (Eptatretus Stoutii)</td>
<td>Alexander Clifford</td>
<td>Univ. of Alberta (30.1)</td>
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<td>5:15 PM</td>
<td>19.2</td>
<td>Evolutionary Variation in Hypoxia Tolerance in Fundulidae Killifishes</td>
<td>Britney Borowiec</td>
<td>Univ. McMaster (19.2)</td>
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<tr>
<td>5:30 PM</td>
<td>3.3</td>
<td>Convergent Evolution of Reduced Temperature Dependent Hemoglobin-Oxygen Affinity in Regionally Endothermic Fishes</td>
<td>Phillip R. Morrison</td>
<td>Univ. of British Columbia (3.3)</td>
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<td>5:45 PM</td>
<td>21.4</td>
<td>The Influence of Cellular Stretch on Extracellular Connective Tissue Deposition in Cultured Trout Cardiac Fibroblasts</td>
<td>Elizabeth Johnston</td>
<td>Univ. of Guelph (21.4)</td>
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AWARDS BANQUET
Sun., 7:00 – 9:00 PM, Astor Ballroom

Plenary Lecture

41.0 PLENARY LECTURE

Sun., 8:00 – 9:00 PM, Astor Ballroom

8:00 PM 41.1 Ecophysiology: Physiology Can Inform Ecology, and Ecology Can Inform Physiology
Raymond Huey. Univ. of Washington, Seattle