5th Biennial North American Society for Comparative Endocrinology

Gainesville, Florida
May 24-28, 2019

held jointly with

5th Biennial Conference of the North American Society for Comparative Endocrinology (NASCE)

and

10th International Symposium on Amphibian and Reptilian Endocrinology and Neurobiology (ISAREN)

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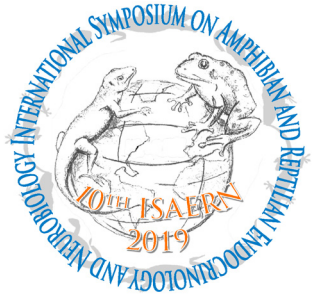

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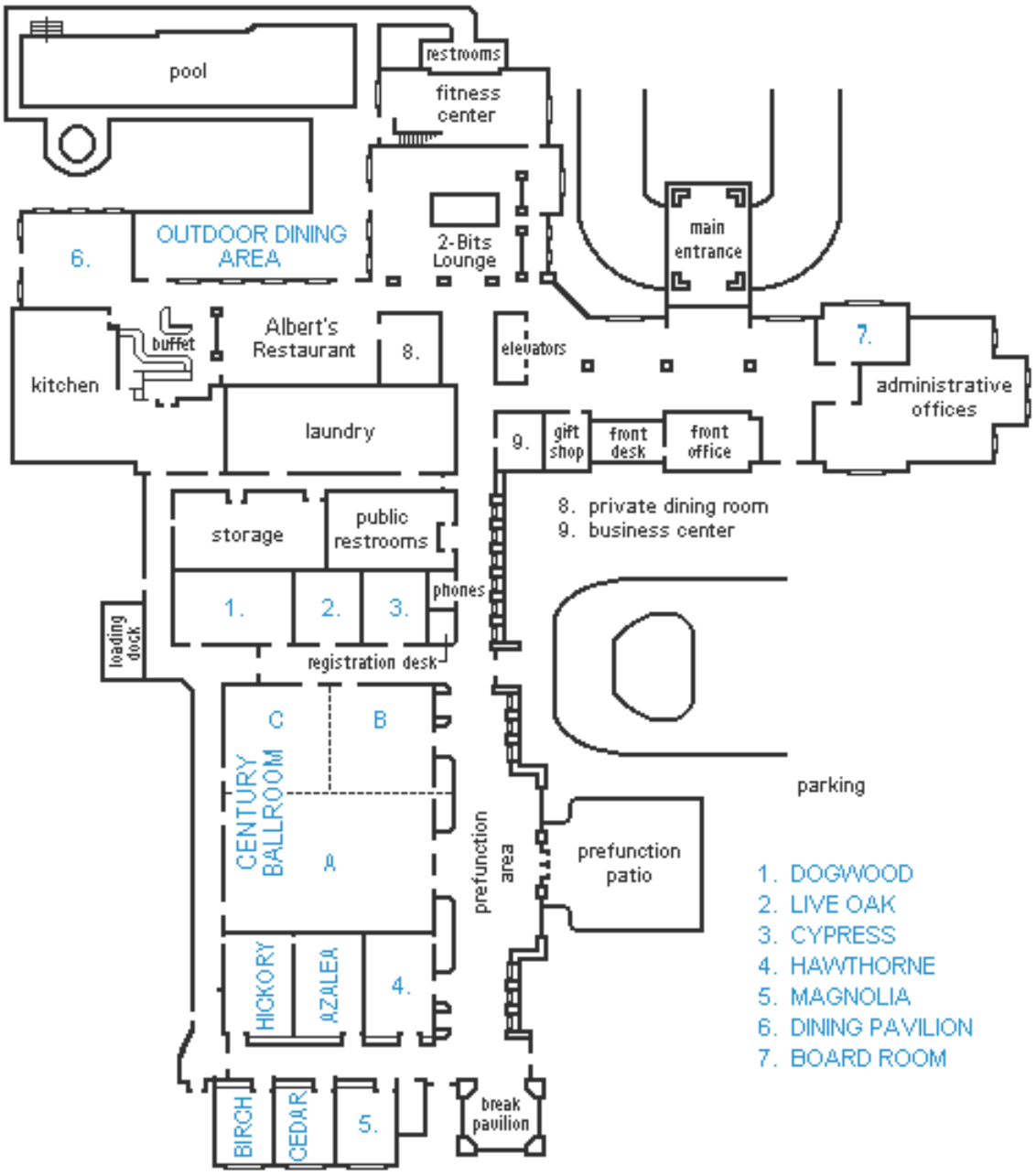

Agenda

Friday, May 24, 2019			
14:00-16:30	NASCE Council Meeting 1- Hawthorne		
18:00-18:15	Welcome - Harn Museum of Art		
18:15-19:15	Dr. Peter Thomas- Gorbman Bern Lecture		
19:15-21:00	Opening Reception		
Saturday, May 25, 2019			
08:00-09:00	Registration		
Plenary 09:00-10:00	Dr. Sheue-Yann Cheng- Century Ballroom ABC		
10:00-10:30	Coffee Break		
	Dogwood	Century Ballroom	Azalea
10:30-12:30 Session Chair	Thyroid Hormones and Development Daniel Buchholz and Aurea Orozco	Neuropeptide Signaling Pathways in Arthropods Angela Lange and Ian Orchard	Stress Axis Function: From Mechanisms to Consequences 1 Bob Dores, James Carr, Kathleen Gilmour, and Matt Vijayan
12:20-14:00	Lunch		
14:00-16:00 Session Chair	Topics in Comparative Endocrinology Christopher Martyniuk and Nancy Denslow	Endocrinology of Domestic and Wild Fauna Marta Romano	Stress Axis Function: From Mechanisms to Consequences 2 Bob Dores, James Carr, Kathleen Gilmour, and Matt Vijayan
16:00-16:30	Coffee Break		
16:30-17:30 Plenary	Dr. Michael Romero- Century Ballroom ABC		
17:30-19:30	Poster Session 1- Odd Number Pre-Function Space		
Sunday, May 26, 2019			
Plenary 09:00-10:00	Dr. Ian Orchard- Century Ballroom ABC		
10:00-10:30	Coffee Break		
	Dogwood	Century Ballroom	Azalea
10:30-12:30 Session Chairs	Metabolism Regulation Suraj Unniappan and Peggy Biga	Non-Coding RNA in Cell Signaling Chun Peng	Omics: Analysis of Genomes, Proteomes, Transcriptomes, and Metabolomes in Comparative Endocrinology John Chang and Hamid Habibi

12:30-14:00	Lunch		
14:00-16:00 Session Chairs	Neuroendocrinology of Feeding Nick Bernier and Helene Volkoff	Novel Hormones and Hormonal Control David Lovejoy	Advancement of Gene Editing and Their Applications Yong Zhu and Yun-bo Shi
16:00-16:30	Coffee Break		
Plenary 16:30-17:30	Gorbman-Bern New Investigator Jason Breves		
17:30-19:30	Poster Session 2- Even Number Pre-Function Space		
Monday, May 27, 2019			
8:00-13:30	Silver Springs State Park Excursion *Shuttles Buses will leave hotel at 8:30*		
	Dogwood	Century Ballroom	Azalea
14:00-16:00 Session Chairs	Hormonal Control of Germinal Stem Cell Development and Gametogenesis Hamid Habibi	Comparative Endocrinology of Osmoregulation Steve McCormick and Jason Breves	ISAREN: Epigenetic Analysis in Amphibian and Reptile Endocrinology and Neurobiology Satomi Kohno and Daniel Buchholz
Plenary 16:00-17:00	Dr. Carlos Aramburo- Century Ballroom ABC		
Tuesday, May 28, 2019			
ISAREN Plenary 09:00-10:00	Dr. Bob Denver- Century Ballroom ABC		
10:00-10:30	Coffee Break		
	Dogwood	Century Ballroom	Azalea
10:30-12:30 Session Chairs	Growth and Growth Factors Maricela Luna	Aspects of Reproductive Endocrinology & Neuroendocrinology 1 Natalia Garcia-Reyero and Vance Trudeau	Neuroendocrine Disruption of Animal Vocalizations and Socio-Sexual Behaviors Cheryl Rosenfeld and Frauke Hoffmann
12:30-14:00	Lunch		
14:00-16:00 Session Chairs	Advances in Endocrine Disruption Science Valerie Langlois and Jan Mennigan	Aspects of Reproductive Endocrinology & Neuroendocrinology 2 Vance Trudeau and Natalia Garcia-Reyero	GnRH-related Peptides in Metazoa: Recent Progress and Discoveries Jean-Paul Paluzzi and Pei-San tsai
16:00-18:00	NASCE Council Meeting 2- Hawthorne		
18:00-19:00 19:00-10:00	Closing Ceremony and Student Awards Presentation + Closing Banquet (separate ticket required)		

Plenary Speakers

DR. PETER THOMAS

GORBMAN-BERN LECTURE

Dr. Peter Thomas is a Professor in the Marine Science and the Ecology, Evolution and Behavior Departments at the University of Texas at Austin and holds the H.E.B. Endowed Chair in Marine Science. He has published over 280 papers in peer reviewed scientific journals and 30 chapters on a wide range of topics in vertebrate reproductive endocrinology and has received several honors in recognition of his contributions to the field, including an honorary doctorate and distinguished lectures in endocrinology. Dr. Thomas has pioneered the identification of novel receptors on the cell surface that mediate the rapid actions of steroid hormones. There is widespread interest in rapid steroid actions because they have been implicated in human diseases such as breast and prostate cancers, hypertension, metabolic syndrome, and neurodegenerative disorders. However, lack of knowledge on the identities of the membrane receptors mediating these steroid actions had slowed progress in this emerging field of endocrinology for over 25 years. In 2003 Thomas and coworkers reported the discovery of the gene encoding the progesterone membrane receptor (mPR) in fish ovaries and the homologous mPRs in other vertebrates, including humans. The mPRs were the first steroid receptors identified that were unrelated to nuclear steroid receptors and naturally generated great interest because they provided an explanation for results showing rapid progesterone effects in many cell types in which nuclear steroid receptors were absent. The two papers describing these findings have been highly cited (779 and 690 times) and have stimulated studies by many research groups on the functions of mPRs in numerous animal models and tissues, including their roles in human reproductive health. Thomas' group have studied mPR's roles in human birth, sperm motility, and malignancy (breast and endometrial cancers) and non-reproductive functions (cardiovascular protection, neurodegeneration). In 2005 Thomas reported that an orphan receptor GPR30 (now known as GPER), is a membrane estrogen receptor in human breast cancer cells (cited 1291 times to date), which was confirmed independently shortly afterwards by another research group. This discovery has stimulated intensive research of the functions of GPER, especially in breast cancer, diabetes, and in cardiovascular system and has resulted in over a thousand publications. Recently, Thomas and coworkers reported the discovery of a novel androgen membrane receptor, ZIP9, in fish ovaries, and that human ZIP9 also functions as an androgen receptor. Importantly, androgens induce apoptosis through ZIP9 in human breast and prostate cancer cells, suggesting it is a potential therapeutic target for cancer treatment. The discovery by the Thomas research group of the identities of all three sex steroid membrane receptors in vertebrates, the mPRs, GPER, and ZIP9, has opened up an entirely new avenue for research on rapid steroid hormone actions and functions in health and disease in humans, as well as providing new potential targets for treating major causes of mortality such as cardiovascular disease, breast and prostate cancers, and neurodegeneration.

RAPID SEX STEROID ACTIONS MEDIATED THROUGH NOVEL TRANSMEMBRANE RECEPTORS: LESSONS FROM STUDIES ON FISH GONADS

Thomas P

Departments of Marine Science and Integrative Biology, Marine Science Institute, University of Texas at Austin, Port Aransas, Texas, USA

In addition to the classic genomic mechanism of steroid action through activation of intracellular nuclear receptors which results in a slow hormonal response (hours to days), steroids also exert rapid actions through binding to receptors unrelated to nuclear receptors on the cell surface to activate intracellular signaling pathways within seconds to minutes

resulting in hormonal responses that are often nongenomic. However, progress in this emerging field of rapid steroid signaling was severely hampered for over 20 years by the failure to identify the membrane receptors mediating these steroid actions. In 2003 we reported the first identification of a membrane steroid receptor in vertebrates, membrane progestin receptor alpha (mPRα) in spotted seatrout ovaries. The mPRα is a member of the progesterone and adipoQ receptor (PAQR) family and is the intermediary in progestin induction of oocyte meiotic maturation and follicle cell anti-apoptosis in seatrout ovaries. Human mPRα was also found to have the characteristics of a membrane progestin receptor and mediate anti-apoptotic effects of progestins in cancer cells. Two years later we used a membrane estrogen binding receptor assay developed in Atlantic croaker ovaries to demonstrate that the orphan receptor, GPR30 (now known as G protein-coupled estrogen receptor, GPER), is a membrane estrogen receptor in breast cancer cells and croaker oocytes. Recently, we identified the membrane androgen receptor, ZIP9, which is a member of the ZIP (SLC39A) zinc transporter family, in croaker ovaries using the same approach we had used to identify seatrout mPRα. Human ZIP9 is expressed in cancer cells where it also functions as a membrane androgen receptor and has the same apoptotic functions as croaker ZIP9. Comparative studies of the ligand binding characteristics, G protein coupling, intracellular signaling pathways, and functions of these three membrane receptors in fish ovarian and human cancer cells have shown they are remarkably similar in these two distantly related vertebrate groups. These findings suggest the steroid signaling and cellular functions of these novel membrane receptors are conserved in vertebrates and probably their primary physiological roles.

JASON P. BREVES
GORBMAN-BERN NEW INVESTIGATOR

Dr. Jason Breves obtained his PhD in 2010 from the University of Hawaii at Manoa under the co-supervision of Drs. Gordon Grau and Tesuya Hirano. Following post-doctoral studies at the Department of Biology and Center for Neuroendocrine Studies, University of Massachusetts Amherst, and Conte Anadromous Fish Research Center, U.S. Geological Survey, Turners Falls, MA, he took up his current position as Assistant Professor, Department of Biology, Skidmore College, NY in 2014 and Associate Chair as of 2018. Dr. Breves' research focuses on the comparative endocrinology of osmoregulation and ion transporting epithelium, as well as metabolism and development in fish models. He received the Scholander Award and the Research Recognition Award from the American Physiological Society in 2013 and is the recipient of the 2019 NASCE Gorbman-Bern New Investigator Award.

Jason is an Assistant Professor in the Biology Department at Skidmore College (NY, USA). Following the completion of a M.S. (University of Rhode Island) with Dr. Jennifer Specker where he investigated the stress physiology of flounder, Jason completed his Ph.D. (University of Hawaii) with Drs. Gordon Grau and Tetsuya Hirano. His dissertation centered on the endocrine control of branchial ionocytes in tilapia. He then joined the University of Massachusetts as a National Institutes of Health NRSA post-doctoral fellow in the Center for Neuroendocrine Studies where he studied the developmental physiology of zebrafish. At the inaugural NASCE meeting in 2011, Jason received the Best Postdoctoral Poster Award. In 2013, Jason received both the Scholander and Research Recognition Awards from the Comparative and Evolutionary Physiology Section (CEPS) of the American Physiological Society. More recently, Jason was named as the recipient of the New Investigator Award from CEPS. Jason's current research program employs a variety of fish models (tilapia, zebrafish, mummichog, and Atlantic salmon) to identify molecular targets of prolactin signaling in addition to resolving the roles of insulin-like growth-factor binding proteins in the regulation of growth and development. As an organismal physiologist, Jason's work seeks to connect observations at the cellular and molecular levels with the physiology, development, and natural histories of the organisms he studies. Jason's laboratory is currently supported by the National Science Foundation (IOS-1755131).

PROLACTIN SUPPORTS ION UPTAKE BY TELEOST IONOCYTES

Breves JP

Department of Biology, Skidmore College, Saratoga Springs, New York, USA

Teleost fishes inhabiting freshwater environments sustain hydromineral balance via the activities of a suite of tissues that counteract diffusive ion losses to the external environment. For nearly sixty years, the pituitary hormone prolactin (Prl) has been widely recognized as a key stimulator of ion-conserving processes; nonetheless, a detailed understanding of the molecular and cellular mechanisms of these actions has proven elusive. This presentation will describe how various experimental approaches (e.g., hypophysectomy, hormone replacement, morpholinos, in vitro gill incubation, Prl receptor blockade) were leveraged to define how Prl controls 'freshwater-type' branchial ionocytes. These ionocytes directly absorb Na^+ and Cl^- from dilute environments. A series of investigations employing euryhaline (tilapia) and stenohaline (zebrafish) models revealed novel targets of Prl that support discrete solute and water-handling processes. Prl-signaling underlies the salinity-dependent gene and/or protein expression of branchial Na^+/Cl^- cotransporter 2 (Ncc2), Clc family Cl^- channel 2c (Clc-2c), and aquaporin 3 (Aqp3). In addition to providing mechanistic insight into how Prl underlies hydromineral balance in teleosts, these investigations have supported the identification of Prl-regulated ion transport pathways in the mammalian kidney.

Acknowledgements: Supported by the National Science Foundation (IOS-1755131).

DR. SHEUE-YANN CHENG

Sheue-yann Cheng, PhD, is the Section Chief of the Gene Regulation, Laboratory of Molecular Biology, NCI, NIH. Dr. Cheng's lifetime interest has been to unravel the complex molecular actions of thyroid hormone. She pioneered the development of mouse models to understand the molecular basis of diseases caused by mutations of thyroid hormone nuclear receptors and developed preclinical mouse models of metastatic follicular thyroid cancer. For her outstanding research accomplishments, Dr. Cheng has received many awards including the prestigious Sidney H. Ingbar Distinguished Lectureship Award of the American Thyroid Association (ATA), Distinguished Service Award and the John B. Stanbury Thyroid Pathophysiology Medal of ATA, the Pitt-Rivers Lectureship Award of The British Thyroid Association, the Charles Harkin Award of NCI, the Merit Awards of the NIH, and the Abbott Thyroid Research Clinical Fellowship Mentor Award of the Endocrine Society. She is an Associate Editor of Thyroid and an Associate Editor-in-Chief of the American Journal of Cancer Research. She serves on the Editorial Board of many journals. She holds patents, and licenses of her inventions and has published more than 265 papers in peer-reviewed journals.

MOLECULAR ACTIONS OF THYROID HORMONE RECEPTOR MUTANTS: WHAT THE ZEBRFISH TELLS US ABOUT A HUMAN DISEASE

Han CR, Holmsen E and Cheng SY

Laboratory of Molecular Biology, Center for Cancer Research, National Cancer Institute, National Institutes of Health, Bethesda, MD, 20892

Thyroid hormone receptors (TR) mediate the diverse biological activities of thyroid hormone (T3) in growth, development, and differentiation. Mutations of the THRA gene cause a debilitating disease known as resistance to thyroid hormone (RTHα). Patients exhibit severe growth retardation, delayed bone development, cognitive defects and skin disorders. That patients are heterozygotes indicates the pathogenesis is mediated by the dominant negative actions of TRα1 mutants. However, the molecular basis underlying these deleterious defects is yet to be fully elucidated, especially during development. We created mutant zebrafish to model RTHα by expressing mutated thra genes (gene duplication in zebrafish: thraa and thrab) by CRISPR/Cas-9 mediated targeted mutagenesis. We obtained two fish lines expressing mutated thraa (8-bp insertion) or thrab (1-bp insertion) to encode C-terminal mutated TRα1 (L405EfsX6 and E394X mutants, respectively). These two mutants exhibited dominant negative activity, similar to those found in patients. Zebrafish expressing E394X mutant displayed more severe and persistent impaired growth than fish expressing L405EfsX6 mutant, with male predominance. We elucidated that the impaired growth was mediated by suppression of the expression of the growth-related genes (gh1, smtla and smtlb) and attenuation of the GH/IGF1 signaling. Further analysis indicated that E394X mutant could act as early as day 7 to delay bone development to contribute to impaired growth. Moreover, E394X mutant fish, but not L405EfsX6 mutant fish, presented the striking hypoplastic epidermis phenotype in 30-day juveniles and adults, due to the suppression of the expression of several T3-regulated keratin genes at both the mRNA and protein levels by the E394X mutant. Thus, we have generated mutant zebrafish faithfully reproduce RTHα in patients. That RTHα is caused by TRα mutations is conserved in humans, mice and zebrafish. The novel zebrafish model not only is useful to understand the in vivo pathogenic actions of TRa1 mutants in a human disease, but also to provide a platform for rapid screening of drugs to treat abnormalities at early development.

DR. MICHAEL ROMERO

L. Michael Romero, Professor of Biology at Tufts University, has studied stress for over 30 years. He earned his PhD from Stanford under the direction of Robert Sapolsky where he focused on the hypothalamic regulation of the pituitary during psychological stress. He then shifted gears from biomedical research to ecological research during his postdoc with John Wingfield at the University of Washington. The unifying theme to his research continues to be the concept of stress. He blends his graduate experience studying stress in white lab rats with his postdoctoral experience studying stress responses in many different wild animals in their natural habitats. He has been trying to answer three main questions: what causes stress in a wild animal; what physiological, endocrinological, and behavioral mechanisms are turned on in response to those stressors; and how do those mechanisms help wild animals live in their natural environments. Throughout his career, the study system has been less important than the questions that could be addressed. Consequently, Professor Romero has work completed or in progress with 16 avian species (focusing on European starlings and house sparrows), 7 reptile species (focusing on Galapagos marine iguanas), 5 wild mammalian species (focusing on brown lemmings and degus), and 2 amphibians (focusing on spotted salamanders). His research takes an integrative approach, utilizing neuroendocrinology, endocrinology, and ecology in both the lab and the field, all with the goal of increasing our comprehension of the causes and effects of stress in wild animals. He has also recently summarized the work in this field in a book he co-wrote with John Wingfield entitled: “Tempests, Poxes, Predators, and People: Stress in Wild Animals and How They Cope.”

REACTIVE SCOPE AS A POTENTIAL PATH FORWARD TO UNDERSTANDING STRESS

Traditionally, our understanding of stress has focused on three main features: (1) stressors that created lack of predictability or controllability; (2) an acute physiological and/or behavioral stress response to those stressors; and (3) chronic stress when acute responses were too frequent or lasted too long. This conceptualization of stress was derived from biomedical and clinical studies, often in laboratory settings with domesticated laboratory species, and has helped us understand many phenomena related to an animal’s responses to stressors. However, data from the last 2+ decades indicates that this conceptualization of stress often lacks explanatory or predictive power, especially when applied to free-living or captive wild animals. Examples include an inability to explain why seasonal variation exists in stress responses, an inability to explain why there is a lack of correlation of responses across different tissues, and an inability to predict physiological responses to chronic stress. Allostasis, with it’s focus on an animal’s energy balance, was a major step forward. For the first time, energy budgets could be used to predict an individual animal’s responses to stress. However, allostasis does not incorporate many important behavioral or physiological responses to stressors, especially acute responses. Reactive scope, with a focus on wear-and-tear, melded these two approaches. Recent data, such as predicting survival of marine iguanas to famine and understanding wound healing rates during stress, suggest that reactive scope may provide better explanatory and predictive power than either of the other approaches.

DR. IAN ORCHARD

Ian Orchard is a Professor Emeritus, University of Toronto. The central theme of his research program is the functioning of the nervous system, using insects as experimental models. His research examines the mechanisms by which the nervous system communicates information; defining hormonal, synaptic, and modulatory mechanisms, using neurophysiological, neurochemical, endocrinological, and molecular biological techniques. The questions he is asking are fundamentally important for all nervous systems. In particular he is interested in the role of peptides and amines as neurohormones, released into the blood to co-ordinate activities of diverse groups of tissues, and as neuromodulators, modulating the ongoing activities of distinct pathways. He has published more than 200 refereed articles and trained more than 150 highly qualified research personnel at the undergraduate, graduate and postdoctoral level, 17 of whom have obtained university faculty positions. He earned a Doctor of Science degree (1988), a PhD (1975), and a B.Sc. (1972), all from the University of Birmingham, UK. Along with this successful research career, he also served as a Vice-President Academic and Provost, University of Waterloo (2014-2017), Vice-President of the University of Toronto, and Principal of the University of Toronto Mississauga (2002-2010), Vice-Provost Students, University of Toronto (1998-2002), and Associate Dean, Sciences, Faculty of Arts and Science, University of Toronto (1993-1998).

THE KISSING BUG RHODNIUS PROLIXUS: A MODEL FOR ENDOCRINOLOGICAL AND PHYSIOLOGICAL STUDIES

Ian Orchard

Department of Biology, University of Toronto Mississauga, Mississauga, ON, Canada

All instars and adults of the kissing bug, *Rhodnius prolixus*, are obligatory blood-feeders and all are vectors for the parasite *Trypanosoma cruzi* that results in human Chagas disease. Given access to a host, unfed *R. prolixus* take a massive blood meal over 15 - 20 mins, which triggers long-term endocrinological and physiological events associated with growth, development and reproduction. Short-term events are also initiated to jettison the excess water and salts imbibed in the blood meal. *T. cruzi* is passed to the human during this diuresis.

The ability to precisely time the onset of both short and long term events (initiated by blood gorging) has made this insect an ideal model for research into physiology and endocrinology, as originally shown by Sir Vincent Wigglesworth in the 1930's and beyond. Here we examine the neurohormones that control diuresis.

Serotonin is a diuretic hormone (DH) in *R. prolixus* and acts in concert with a member of the corticotropin-releasing factor (CRF)-related family of insect neuropeptides (Rhopr-CRF/DH), via their respective G-protein-coupled receptors (GPCRs). Serotonin and Rhopr-CRF/DH have potent biological activity on anterior midgut and Malpighian tubules, and work synergistically, via cAMP, to stimulate diuresis following gorging.

An anti-diuretic hormone (ADH), a member of the CAPA family, Rhopr-CAPA-2, and its cognate GPCR, terminate this diuresis, inhibiting serotonin-stimulated secretion by Malpighian tubules. Rhopr-CAPA-2 eliminates the synergism between serotonin and Rhopr-CRF/DH, thereby leading to a quick cessation of diuresis.

The interplay between the DHs and ADH in R. prolixus results in a remarkable diuresis; a diuresis that has evolved to eliminate excess water and salts from a massive blood meal in a very rapid way. The parasite, *T. cruzi*, is transmitted via the excreted fluid during this diuresis, and therefore these neurohormones control the transmission of Chagas disease.

Supported by an NSERC Discovery Grant.

DR. CARLOS ARAMBURO

He was born on October 7, 1953 in Teziutlán, Pue., Mexico. He completed his undergraduate studies of Pharmacobiological Chemist (1972-76), Master (1978-80) and Doctorate in Chemical Sciences (Biochemistry) (1981-83) in the Faculty of Chemistry, at the National Autonomous University of Mexico (UNAM), and made several research stays (Comparative Endocrinology) at Rutgers-The State University of New Jersey, USA (1985-1993) in the laboratory of Dr. Colin G. Scanes. His research work has been carried out in the National Institute of Nutrition "Salvador Zubirán" (1975-83); and then in the Institute for Biomedical Research (1983-93) and in the Institute of Neurobiology (1993-to date), both at UNAM, where he is a tenured Full Professor.

His area of specialty is the biochemistry of proteins, particularly the molecular and functional characterization of peptide hormones and neuroendocrine messengers. His research lines have always been involved with comparative endocrinology. In the last decades he has focused on studies on the heterogeneity of growth hormone (GH) and the changes it undergoes during the evolution of vertebrates, showing that it is a family of proteins with functional and molecular diversity. Also, his group has studied the relevance of extrapituitary expression of GH in diverse organs and tissues of the nervous, immune, and reproductive systems, among others, and has shown that this hormone plays an important role through autocrine, paracrine and/or intracrine mechanisms, which modulate cell proliferation, differentiation and survival/protection effects. Some of his studies include the description of local expression of GH and GH receptor (GHR) mRNAs and proteins in various neural tissues of several vertebrate models (mammals, birds, reptiles), as well as the neurotrophic and neuroprotective actions of GH in response to neural damage provoked by different insults, in the cerebellum (hypoxia/ischemia) and in the neuroretina (excitotoxic damage). These studies have shown that a complex cascade of neurotrophins and growth factors, which have been classically related to damage prevention and neural tissue repair, likely mediates GH neuroprotective actions. Another research interest has been the evolution of the mechanisms involved in the regulation of the somatotropic axis in vertebrates.

He was founder and served as the first Academic Secretary of the Centre of Neurobiology (1993-2002) and as the first Director of the Institute of Neurobiology (2002-2007) at UNAM's Campus Juriquilla in Queretaro. He served, for eight years, as Vice-President of Scientific Research at UNAM, and as Chairman of the Technical Council of Scientific Research of the University (2007-2015). Currently, he serves as Director General of Academic Affairs (DGAPA) at UNAM.

He is a member of 12 scientific societies, and has served as member of the Executive Board of the Mexican Society of Physiological Sciences (1994-95) and of the International Council of the International Society of Avian Endocrinology (1997-2004, 2012-2020). He was one of the three co-founders of the North American Society for Comparative Endocrinology, NASCE (2010-2011), where he has been Vice-President (2011-2013), President (2013-2015), ex-officio member of the Executive Board (2015-2017), and member of the International Council (2017-2019).

ENDOCRINE/PARACRINE/AUTOCRINE NEUROPROTECTIVE ACTIONS OF GROWTH HORMONE

Arámburo C (1), Ávila-Mendoza J (2), Baltazar-Lara MR (1), Fleming T (1,2), Alba-Betancourt C (1), Carranza M (1), Balderas-Márquez JE (1) Epardo D (1), Harvey S (2), Luna M (1), Martínez-Moreno C (1).

[1]Dept. Cellular and Molecular Neurobiology, Instituto de Neurobiología, Campus Juriquilla, Universidad Nacional Autónoma de México, Querétaro, Qro., 76230, México, and [2]Dept. Physiology, University of Alberta, Edmonton, T6G 2H7, Canada.

It is now accepted that, besides the pituitary somatotrophs, growth hormone (GH) can be expressed in several extrapituitary locations, such as the nervous, immune and reproductive systems, among others. The brain is a GH target site and GH receptors are expressed widely throughout the central nervous system (CNS). The presence of GH and GH mRNA in neural tissues is well established. There is increasing evidence that GH may be involved in neurotrophic, neuroprotective and neuro-regenerative actions. Although systemic (endocrine) GH may exert some of these effects, evidence indicates that locally expressed neural GH, acting through autocrine and/or paracrine mechanisms may also participate in these actions. We described the local expression of GH and GH receptor (GHR) mRNAs and proteins in various neural tissues of several vertebrate models (mammals, birds, reptiles), and studied the neurotrophic, neuroprotective and neuroregenerative actions of GH in response to neural damage provoked by

different insults, in the cerebellum (hypoxia/ischemia) and in the neuroretina (excitotoxic damage). We also analyzed the participation of canonical and non-canonical pathways and some of the mechanisms involved in these actions, which include a complex network of several neurotrophins, cytokines and neural growth factors that have been related to neural damage prevention, which likely mediate GH protective roles in neural tissues.

This work was partially supported by PAPIIT-DGAPA-UNAM (IN201817, IN206115, IA200717, IN207018) and CONACYT (178335, 285004).

DR. ROBERT J. DENVER

ISAREN LECTURE

Dr. Robert J. Denver is Professor and Chair of the Department of Molecular, Cellular and Developmental Biology (MCDB), and Professor of Ecology and Evolutionary Biology (EEB) at the University of Michigan, Ann Arbor. He earned his B.S. in Physiology from Rutgers University, and the Ph.D. in Zoology from the University of California at Berkeley. He is a developmental neuroendocrinologist with expertise in gene regulation by nuclear hormone receptors; development and evolution of the neuroendocrine stress axis; mechanisms of developmental plasticity; endocrinology, ecology, and molecular biology of amphibian metamorphosis; and mechanisms of action of Krüppel-like factors in nervous system development and regeneration. He is an elected fellow of the American Association for the Advancement of Science (AAAS), he was co-founder and first president of the North American Society for Comparative Endocrinology (NASCE), and he served as president of the International Federation of Comparative Endocrine Societies (IFCES). He was a regular member of the Integrative and Clinical Endocrinology and Reproduction (ICER) Study Section for the National Institutes of Health, a member of the Annual Meeting Steering Committee for the Endocrine Society, and he has served on seven scientific advisory panels for the US Environmental Protection Agency, including the Endocrine Disrupter Screening Program, and four grant review panels for the US National Science Foundation. He serves as associate editor for General and Comparative Endocrinology.

THYROID HORMONE ACTION IN XENOPUS TADPOLE BRAIN DURING METAMORPHOSIS

Robert J. Denver

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During metamorphosis the tadpole brain undergoes dramatic changes such as cell expansion, cell migration, apoptosis, differentiation and maturation. These cellular and tissue processes are regulated by thyroid hormone (TH), which induces gene regulation programs that drive the diverse morphogenetic processes. Thyroid hormone acts via two evolutionarily conserved nuclear receptors, TRα and TRβ. The gene that codes for TRα (thra) is expressed immediately after the tadpole hatches, and is maintained throughout tadpole development and metamorphosis. By contrast, expression of the gene that codes for TRβ (thrb) coincides with the development of the tadpole's thyroid gland, increasing during metamorphosis and peaking at metamorphic climax. This expression pattern depends on TH; i.e., thrb is autoinduced. The TRα is the major TR subtype expressed in tadpole brain, and it is required for the majority of gene regulation responses to TH, and for neurogenesis. Tadpoles with the thra gene inactivated have proportionally smaller brains compared with wild type. The TRβ mediates TH actions on cell differentiation and apoptosis. Thyroid hormone receptors function as epigenetic switches to modify chromatin structure, thereby influencing gene transcription. Earlier work showed that TH induces posttranslational modifications of histones. We found that TH also influences chromatin structure by modulating DNA methylation. While TH modulates both DNA methylation and demethylation in tadpole brain, DNA demethylation predominates during metamorphosis. The action of TH on DNA methylation is mediated, in part, by direct TH regulation of the DNA methyltransferase 3a gene. The action of TH on DNA demethylation is more complex, with TH directly and indirectly regulating transcription of genes that code for enzymes involved in the DNA demethylation pathway. We also found that liganded TRs recruit ten eleven transferase (TET) enzymes to chromatin, which leads to localized DNA demethylation. The TET enzymes are dioxygenases that convert 5-methylcytosine to several DNA demethylation intermediates. Thyroid hormone has complex actions on developing tadpole brain, and studies in mammals support that many of these actions are evolutionarily conserved.

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Program

Friday, May 24, 2019			
14:00-16:30	**NASCE Council Meeting 1- Hawthorne**		
18:00-18:15	**Welcome and Opening Reception- Harn Museum of Art**		
18:15-19:15	**Dr. Peter Thomas- Gorbman Bern Lecture**		
19:15-21:00	**Opening Reception**		
Saturday, May 25, 2019			
08:00-09:00	**Registration**		
Plenary 09:00-10:00	**Dr. Sheue-Yann Cheng- Century Ballroom ABC**		
10:00-10:30	**Coffee Break**		
	Dogwood	**Century Ballroom**	**Azalea**
Session **Chairs**	**Thyroid Hormones and Development** **Daniel Buchholz and Aurea Orozco**	**Neuropeptide Signaling Pathways in Arthropods** **Angela Lange and Ian Orchard**	**Stress Axis Function: From Mechanisms to Consequences 1** **Bob Dores, James Carr, Kathleen Gilmour, and Matt Vijayan**
10:30-12:30	**Darras, Veerle** AGE-DEPENDENT CHANGES IN GLUCOSE METABOLISM IN DEIODINASE TYPE 2 KNOCKOUT ZEBRAFISH *Houbrechts A.M., Darras V.M.*	**Mykles, Donald** SIGNALING PATHWAYS CONTROLLING PHASE TRANSITIONS IN THE CRUSTACEAN MOLTING GLAND *Mykles DL, Chang ES, Chang SA, Durica DS, Tomanek L, Ventura T , Zhou W*	**Faught, Erin** LOSS OF THE GLUCOCORTCOID RECEPTOR IN ZEBRAFISH IMPROVES MUSCLE GLUCOSE AVAILABILITY AND INCREASES GROWTH *Faught E, Vijayan M*
	Orozco, Aurea KNOCK-DOWN OF SPECIFIC THYROID HORMONE RECEPTOR ISOFORMS IMPAIRS BODY PLAN DEVELOPMENT IN ZEBRAFISH *Lazcano I, Rodríguez-Ortiz R, Villalobos P, Solís-Saínz JC, Orozco A*	**Park, Yoonseong** DISRUPTION OF NEUROPEPTIDERGIC SYSTEM IN ARTHROPOD PEST CONTROL *Park Y*	**Deviche, Pierre** GLUCOCORTICOIDS AND GLYCEMIA DURING STRESS IN BIRDS *Deviche P, Griffith S, Buchanan K*
	Shibata, Yuki THYROID HORMONE RECEPTOR DEFFICIENCY ACCELERATES CONNECTIVE TISSUE DEVELOPMENT BUT PREVENTS EPITHELIAL TRANSFORMATION DURING METAMORPHOSIS IN XENOPUS TROPICALIS. *Shibata Y, Okada M, Wen L, Shi YB.*	**Zandawala, Meet** MODULATION OF DROSOPHILA POST-FEEDING PHYSIOLOGY AND BEHAVIOR BY THE NEUROPEPTIDE LEUCOKININ *Zandawala M, Yurgel M, Texada M, Liao S, Rewitz K, Keene A, Nässel D*	**Hoglin, Brianne** CHARACTERIZATION OF WHALE SHARK MELANOCORTIN-2 RECEPTOR REVEALS DISTINCT PATTERNS OF MC2R ACTIVATION FOR HOLOCEPHALAN AND ELASMOBRANCH CARTILAGINOUS FISHES *Hoglin B, Dores R*

	Suzuki, Ken-ichi INVOLVEMENT OF THYROID HORMONE RECEPTORS IN THE HEMOGLOBIN SWITCH DURING FROG METAMORPHOSIS *Suzuki KT, Buchholz D*	**Rocco, David** EXPRESSION PROFILING, DOWNSTREAM SIGNALING AND INTER-SUBUNIT FUNCTIONAL CHARACTERIZATION OF AN EVOLUTIONARY ANCIENT GLYCOPROTEIN HORMONE SYSTEM (GPA2/GPB5) IN THE MOSQUITO, AEDES AEGYPTI *Rocco D, Paluzzi JP*	**Dores, Robert** EVALUATING THE ROLE OF THE MELANOCORTIN-5 RECEPTOR IN THE HPA/HPI AXIS: A PHYLOGENETIC STUDY *Dores RM, Oberer N, Hoglin B*
	Taylor, Elias NON-GENOMIC THYROID HORMONE SIGNALING IN INVERTEBRATES: T4 REGULATES SKELETOGENESIS IN THE PURPLE SEA URCHIN VIA AN INTEGRIN-MEDIATED MAPK CASCADE *Taylor E, Heyland A*	**Leyria, Jimena** THE INVOLVEMENT OF INSULIN-LIKE PEPTIDE SIGNALING IN THE REPRODUCTIVE SUCCESS OF RHODNIUS PROLIXUS, A VECTOR OF CHAGAŚ DISEASE *Leyria J, Orchard I, Lange AB*	**Bernier, Nicholas** CORTICOTROPIN-RELEASING FACTOR EXERTS NEUROPROTECTIVE EFFECTS AGAINST AMMONIA NEUROTOXICITY IN ISOLATED LARVAL ZEBRAFISH BRAINS *Bernier NJ, Williams TA*
		Ayub, Mahnoor THE ROLE OF SIFAMIDE AS A NEUROHORMONE IN THE BLOOD-GORGING INSECT, RHODNIUS PROLIXUS. *Ayub M, Lange AB, Orchard I*	**Schaaf, Marcel** GLUCOCORTICOID MODULATION OF THE IMMUNE RESPONSE IN ZEBRAFISH *Xie Y, Schaaf MJM*
12:30-14:00	**Lunch**		
Session **Chair**	**Topics in Comparative Endocrinology** **Christopher Martyniuk and Nancy Denslow**	**Endocrinology of Domestic and Wild Fauna** **Marta Romano**	**Stress Axis Function: From Mechanisms to Consequences 2** **Bob Dores, James Carr, Kathleen Gilmour, and Matt Vijayan**
14:00-16:00	**Denslow, Nancy** PROTEOGENOMICS OF FATHEAD MINNOW (PIMEPHALES PROMELAS) AS A FIRST STEP TO IDENTIFY TRANSCRIPT VARIANTS OF IMPORTANCE TO NEUROENDOCRINOLOGY *Denslow ND, Lavelle C, Smith LC, Bisesi JH, Sanchez CS, Buerger AN, Garcia-Reyero N, Sabo-Attwood T*	**Hamlin, Heather** INFLUENCE OF TEMPERATURE REGIME AND EPIZOOTIC SHELL DISEASE ON ECDYSTERONE CONCENTRATIONS IN AMERICAN LOBSTERS, HOMARUS AMERICANUS *Hamlin HJ, Tudor MS, Bouchard DA*	**Lutterschmidt, Deborah** MECHANISMS OF LIFE-HISTORY TRANSITIONS: INTERACTIONS AMONG GLUCOCORTICOIDS, NEUROPEPTIDES, AND METABOLIC FACTORS REGULATE THE SEASONAL SWITCH FROM REPRODUCTION TO FORAGING BEHAVIOR IN GARTER SNAKES *Lutterschmidt DI, Dayger CA, Lucas AR, Wilson, R*C
	Sangha, Vishal PHYSIOLOGICAL EFFECTS OF STRUCTURAL ANALOGS OF KININS AND CAPA IN RHODNIUS PROLIXUS *Sangha V, Nachman RJ, Orchard, Lange AB*	**González-de-la-Vara, Marcela** HOW TO GROUP PRIMIPAROUS DAIRY COWS: BEHAVIOR, CORTISOL IN SERUM AND HAIR AND PRODUCTION PERFORMANCE. *González-de-la-Vara M, De Anda F, Vázquez-Ch JC, Romano MC*	**Gilmour, Kathleen** TOO STRESSED TO EAT OR GROW: THE METABOLIC COST OF CHRONIC SOCIAL STRESS IN RAINBOW TROUT (Oncorhynchus mykiss) *Gilmour KM, Best C, Culbert BM, Jennings K, Kostyniuk DJ, Saulnier RJ, Lamarre SG, Mennigen J, Moon TW*
	Wu, Xinjun INVOLVEMENT OF MULTIPLE PROGESTERONE RECEPTORS IN OVARY MAINTENANCE IN ZEBRAFISH *XinJun W, Andrew L, Marcus W, Pujan P, Tyler O, Yong Z*	**Romano, Marta** SEXUAL MATURATION OF AFRICAN ELEPHANTS RAISED IN CAPTIVITY *García-Delgado SD, Martínez G, Pedernera M, Olloqui E, Valdez RA, Romano MC*	**Edwards, Thea** PHYSIOLOGICAL COSTS OF CHRONIC SEASONAL HYPOXIA IN OKAVANGO TILAPIA *Edwards TM, Mosie IJ, Moore BC, Lobjoit G, Bachman RE, Murray-Hudson M*

	Thomson, Paisley DOES CHRONIC EXPOSURE TO AGRICULTURAL RETENTION POND WATER INDUCE ENDOCRINE DISRUPTION IN THE AMERICAN TOAD? *Thomson P, Labranche P-A, Patey G, Robinson SA, Gruyer N, Thériault G, and Langlois VS*	**Roda-Martinez, Alba Zulema** SERUM GLUCOCORTICOID PROFILES IN THREE SPECIES OF MEXICAN PRIMATES: RESPONSE TO CAPTURE-RESTRAINT *Rodas-Martínez AZ*	**Harris, Breanna** OF MICE AND MEN: RELATIONSHIP AMONG STRESS, GLUCOCORTICOIDS, AND COGNITIVE FUNCTION *Harris BN*
	Zhang, Hugh CAGE ENRICHMENTS NEGATIVELY IMPACT THE REPRODUCTIVE BRAIN IN MALE MICE *Zhang HS, Tsai PS*	**Kohno, Satomi** TIMING OF A GONADAL COMMITMENT TO THE TESTICULAR DIFFERENTIATION BEYOND ESTROGEN-SIGNAL PRODUCING OVARY IN THE TEMPERATURE-DEPENDENT SEX DETERMINATION OF THE AMERICAN ALLIGATOR *Vang D, Ang E, Schoenfuss HL, Kohno S*	**Gorissen, Marnix** A NOVEL ROLE FOR LEPTIN IN FISH: BRANCHIAL LEPTIN IS INVOLVED IN SHORT-TERM SEAWATER ACCLIMATION IN ATLANTIC SALMON (SALMO SALAR, L.) *Nilsen TO, Ebbesson LOE, van den Akker M, McCormick SD, Bernier NJ, Flik G, Gorissen M*
	Sajadi, Farwa CAPA NEUROPEPTIDES: ANTI-DIURETIC HORMONE ACTIVITY AND SIGNALING CASCADE IN THE DISEASE-VECTOR MOSQUITO, AEDES AEGYPTI *Sajadi F, Paluzzi JP*		**Carr, James** POTENTIAL NEW ROLES FOR CRF AND NPY IN MIDBRAIN DEFENSE *Carr JA, Prater CM, Islam R, Harris BN*
16:00-16:30	**Coffee Break**		
Plenary 16:30-17:30	**Dr. Michael Romero- Century Ballroom ABC**		
17:30-19:30	**Poster Session 1- Odd Number** **Pre-Function Space**		
Sunday, May 26, 2019			
Plenary 09:00-10:00	**Dr. Ian Orchard- Century Ballroom ABC**		
10:00-10:30	**Coffee Break**		
	Dogwood	**Century Ballroom**	**Azalea**
Session **Chairs**	**Metabolism Regulation** **Suraj Unniappan and Peggy Biga**	**Non-Coding RNA in Cell Signaling** **Chun Peng**	**Omics: Analysis of Genomes, Proteomes, Transcriptomes, and Metabolomes in Comparative Endocrinology** **John Chang and Hamid Habibi**
10:30-12:30	**Mennigen, Jan** ACUTE AND LONG-TERM METABOLIC CONSEQUENCES OF EMBRYONIC ZEBRAFISH EXPOSURE TO AQUATIC CONTAMINANTS *ALLAIRE-LEUNG M, TRAHAN A , HUM C, TU W, MENNIGEN JA*	**Peng, Chun** MICRORNAS AS KEY PLAYERS IN ENDOCRINOLOGY *Peng C*	**Weljie, Aalim** THE RHYTHMS OF METABOLISM: TRANSLATIONAL CHRONOBIOLOGY DECOUPLES TRANSCRIPTION FROM METABOLISM *Krishanaiah S, Sengupta A, Malik D, Botallico L, Altman B, Dang CV, Hogenesch J, Weljie AM*
	Chung, J. Sook EVOLUTIONARY AND ECOLOGICAL ENDOCRINOLOGY OF INVERTEBRATE CARBOHYDRATE METABOLISM *Chung JS*	**Li, Julang** THE ROLE OF MICRORNA IN THE REGULATION OF OOCYTE MATURATION *Li J, Pan B, Toms D*	**Martyniuk, Chris** TWENTY YEARS? OMICS, ESTROGENS, AND FISH. *Martyniuk CJ, Feswick A, Munkittrick KR, Dreier DA, Denslow ND*

	Charli, Jean-Louis THYROTROPIN-RELEASING HORMONE-DEGRADING ECTOENZYME CONTROLS THYROTROPIN SECRETION AND BODY WEIGHT IN MALE RODENTS *Charli JL, Cote-Vélez A, Rodríguez-Rodríguez A, Hernández-Ortega K, Uribe MR, Anaya-Vergara M, Pérez-Estrada JR, Matziari M, Joseph-Bravo P*	**Yang, Burton** YAP IS ANTAGONIZED BY ITS CIRCULAR RNA VIA SUPPRESSING THE ASSEMBLY OF THE TRANSLATION INITIATION MACHINERY *Wu N, Yuan Z, Du WW, Fang L, Lyu J, Zhang C, He A, Eshaghi E, Ma J, Yang BB*	**Vijayan, Matt** MINERALOCORTICOID RECEPTOR SIGNALLING IN ZEBRAFISH LARVAE *Faught E, Vijayan M*
	Deck, Courtney EVIDENCE FOR A LEPTIN-INSULIN AXIS IN THE MOZAMBIQUE TILAPIA (OREOCHROMIS MOSSAMBICUS) *Deck CA, Honeycutt JL, Severance ME, and Borski RJ*	**O'Brien, Jacob** MIR-218-5P MODULATES NEUROPEPTIDE Y SIGNALING IN TROPHOBLASTS *O'Brien J, Hayder H, Brkic J, Dunk C, Lye S, and Peng C*	**Ladisa, Claudia** METABOLIC PROFILING OF MALE GOLDFISH LIVER REVEALS PATTERNS OF ENERGY ALLOCATION IN SUPPORT OF GROWTH AND REPRODUCTION *Ladisa C, Ma Y, Habibi HR*
			Bonett, Ronald GENOMIC AND TRANSCRIPTOMIC CONSEQUENCES OF THYROID HORMONE SENSITIVITY EVOLUTION IN SALAMANDERS *Bonett RM, Herrboldt MA, Clay TA, Ledbetter NM,Torres CD*
			Reynolds, Hannah FISHING FOR PHYSIOLOGY IN BIG DATA: A MACHINE LEARNING ROADMAP FROM TRANSCRIPTOME TO PHYSIOLOGY IN THE TILAPIA *Reynolds HM, Baltzegar DA, Douros JD, Reading BJ, Borski RJ*
12:30-14:00	**Lunch**		
Session **Chairs**	**Neuroendocrinology of Feeding** **Nick Bernier and Helene Volkoff**	**Novel Hormones and Hormonal Control** **David Lovejoy**	**Advancement of Gene Editing and Their Applications** **Yong Zhu and Yun-bo Shi**
14:00-16:00	**Schneider, Jill** INGESTIVE OR REPRODUCTIVE BEHAVIOR? HORMONE-NEUROPEPTIDE INTERACTIONS THAT ORCHESTRATE THE TRADEOFF *Schneider J. E., Kriegsfeld L.*	**Lovejoy, David** DISCOVERY AND FUNCTION OF THE TENEURINS AND THEIR INTERACTION WITH LATROPHILINS IN VERTEBRATES: A PHYLOGENETICALLY ANCIENT MECHANISM OF RECEPTOR-LIGAND INTERACTIONS IN THE CENTRAL NERVOUS SYSTEM *Tucker R, Lovejoy D*	**Ge, Wei** FUNCTIONAL ANALYSIS OF THE HYPOTHALAMIC-PITUITARY-GONADAL AXIS IN THE ZEBRAFISH – A GENETIC APPROACH WITH GENOME EDITING TECHNOLOGY *Ge W*
	Volkoff, Helene THE ENDOCRINE REGULATION OF FEEDING IN SELECTED FRESHWATER TELEOST FISH *Volkoff, H*	**Biga, Peggy** INCREASED METABOLIC RATE BY TENEURIN C-TERMINAL ASSOCIATED PEPTIDE (TCAP)-3: A COMPARATIVE ANALYSIS ACROSS ZEBRAFISH LIFE STAGES. *Reid R, D'Aquila A, Lovejoy D, Biga PR*	**Chen, Liangbiao** STUDIES ON MOLECULAR ADAPTION OF HORMONAL PEPTIDES FROM ANTARCTIC FISHES USING THE CRISPR-CAS9 TECHNOLOGY IN MODEL FISHES *Mingli L, Yan W, Chen L*

	Takahashi, Akiyoshi EFFECTS OF CHROMATIC LIGHT ON SOMATIC GROWTH AND ENDOCRINE FUNCTIONS OF FLATFISHES *Takahashi A, Shimizu D, Kasagi S, Mizusawa K*	**Hogg, David** CORTICOTROPIN-RELEASING FACTOR (CRF) SIGNALING IS ANTAGONIZED BY TENEURIN C-TERMINAL ASSOCIATED PEPTIDE (TCAP-1): INSIGHTS INTO THE INTERACTION OF TCAP-1 AND CRF IN NEURONS *Hogg D, Lovejoy D*	**Buchholz, Daniel** THYROID HORMONE SIGNALING IS NOT NECESSARY NOR SUFFICIENT FOR FROG METAMORPHOSIS *Shewade LH, Sterner ZR, Buchholz DR*
	Butt, Robyn GOLDFISH (CARASSIUS AURATUS) GUT MICROBIOTA COMPOSITION AND THE EXPRESSION OF GENES RELATED TO APPETITE AND DIGESTION *Butt RL, Volkoff H*	**D'Aquila, Andrea** USING COMPARATIVE MODELS OF MUSCULAR DYSTROPHY TO ASSESS TENEURIN C-TERMINAL ASSOCIATED PEPTIDE (TCAP)-1 AS A NOVEL THERAPEUTIC APPROACH. *Andrea L. D'Aquila, Rylie M. Hightower, David A. Lovejoy, Matthew S. Alexander, Peggy R. Biga*	**Wang, Deshou** ADVANCEMENT IN GENE EDITING AND THEIR APPLICATION IN TILAPIA SEX DETERMINATION *Wang DS, Li MH, Dai SF*
	Unniappan, Suraj BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) IS A MEAL-RESPONSIVE OREXIGEN IN ZEBRAFISH *Blanco AM, Bertucci JI, Unniappan S*	**Peng, Di** DISTRIBUTION OF THE NOVEL REPRODUCTIVE PEPTIDE SECRETONEURIN IN THE BRAIN AND PITUITARY OF THE ZEBRAFISH *Peng D*	**Carter, Nichole** OVARIAN DEVELOPMENT IN ZEBRAFISH REQUIRES ADAMTS9 *Carter N, Roach Z, Yong Z*
			Hui, Zhao DELINEATE THE REGULATORY NETWORK FOR BMP SIGNALING DURING embryonic development *Wang C, Liu Z, Zhao H*
16:00-16:30	**Coffee Break**		
Plenary 16:30-17:30	**Gorbman-Bern New Investigator** **Jason Breves**		
17:30-19:30	**Poster Session 2- Even Number** **Pre-Function Space**		
Monday, May 27, 2019			
8:00-13:30	**Silver Springs State Park Excursion** *Shuttles Buses will leave hotel at 8:30*		
	Dogwood	**Century Ballroom**	**Azalea**
Session **Chairs**	**Hormonal Control of Germinal Stem Cell Development and Gametogenesis** **Hamid Habibi**	**Comparative Endocrinology of Osmoregulation** **Steve McCormick and Jason Breves**	**ISAREN: Epigenetic Analysis in Amphibian and Reptile Endocrinology and Neurobiology** **Satomi Kohno and Daniel Buhholz**
14:00-16:00	**Dobrinski, Ina** MODELS TO STUDY CELL-CELL INTERACTIONS IN THE MAMMALIAN TESTIS *Sakib S, Goldsmith T, Valenzuela-Leon P, Dobrinski I*	**Seale, Andre** ACCLIMATION OF FISH TO DYNAMICALLY CHANGING SALINITIES: INSIGHTS FROM THE EURYHALINE MOZAMBIQUE TILAPIA *Seale AP*	**BUISINE, Nicolas** DNA METHYLATION LANDSCAPE CHANGES DURING THYROID HORMONE AND GLUCOCORTICOID CROSSTALKS AT XENOPUS METAMORPHOSIS *Jonchere, Blugeon, Pouch, Sachs, Buisine*

	Nobrega, Rafael CORTISOL AND THYROID HORMONES: "NEW" PLAYERS OF ZEBRAFISH SPERMATOGENESIS *Nobrega RH, Tovo-Neto A, Rodrigues MS, Habibi HR*	**Crespi, Erica** RELATIONSHIPS BETWEEN OSMOREGULATION AND IMMUNITY IN AMPHIBIANS *Crespi EJ, Hall EM, Schock DM*	**Helbing, Caren** LOOKING FOR A SILVER LINING: THE IMPACT OF NANOSILVER ON THYROID HORMONE SIGNALING IN FROG TADPOLE METAMORPHOSIS *Helbing CC*
	Pourmohammadi fallah, Hamideh Paracrine control of germinal stem cell development and spermatogenesis by GnIH in zebrafish (Danio rerio). *Fallah HP, Rodrigues MS, Nóbrega RH, Habibi HR*	**McCormick, Stephen** EVIDENCE FOR A ROLE OF THYROID STIMULATING HORMONE, DEIODINASE AND THYROID HORMONE IN THE PHOTOPERIOD-DRIVEN SEASONAL CLOCK OF FISH *McCormick SD, Irachi S, Fleming M, Maugars G, Björnsson BT, Dufour S*	**Ishihara, Akinori** EPIGENETIC CHANGES CAUSED BY FASTING AND LOW TEMPERATURE IN AMPHIBIANS *Ishihara A, Yamauchi K*
	Martinez Bengochea, Anabel Lee GONADAL TRANSCRIPTOME OF HYBRIDS DERIVED FROM CLOSELY RELATED SPECIES WITH THE SAME SEX DETERMINING GENE: O. latipes and O. curvinotus. *Martinez-Bengochea, A., Adolfi, M.C., Kneitz, S., Herpin, A., Nóbrega, RH. Schartl, M.*	**Gong, Ningping** DIVERGENT RECEPTORS FOR GROWTH HORMONE AND PROLACTIN DISCOVERED IN AGNATHANS: GENE SEQUENCES AND TISSUEEXPRESSION PATTERNS AT DIFFERENT LIFE STAGES OF SEA LAMPREY *Gong N (1), Sheridan MA (1), Ferreira-Martins D (2), McCormick SD (3)*	**Parrott, Ben** PRECOCIOUS ESTROGEN SIGNALING DURING EMBRYONIC DEVELOPMENT UNDERLIES PERSISTENT ALTERATIONS OF OVARIAN TRANSCRIPTIONAL NETWORKS IN AN ENVIRONMENTAL MODEL OF ENDOCRINE DISRUPTION *Hale M,Parrott B*
	da Silva Rodrigues, Maira ROLE OF THYROID HORMONES IN ZEBRAFISH SPERMATOGENESIS *Rodrigues MS, Tovo-Neto A, Nobrega RH, Habibi HR*	**Akashi, Horoshi** ELUCIDATION OF MOLECULAR MECHANISM UNDERLYING TEM-PERATURE-SENSING DURING SEX DETERMINATION IN ALLIGATOR AND TURTLES *Hiroshi Akashi, Kenji Toyota, Satomi Kohno S, Taisen Iguchi , Shinichi Miyagawa*	**Shi, Yun-Bo** EPIGENETIC MODIFICATIONS IN THE DEVELOPMENT OF INTESTINAL STEM CELLS *Shi YB*
Plenary 16:00-17:00	**Dr. Carlos Aramburo- Century Ballroom ABC**		
Tuesday, May 28, 2019			
ISAREN Plenary 09:00-10:00	**Dr. Bob Denver- Century Ballroom ABC**		
10:00-10:30	**Coffee Break**		
	Dogwood	**Century Ballroom**	**Azalea**
Session	**Growth and Growth Factors**	**Aspects of Reproductive Endocrinology & Neuroendocrinology 1**	**Neuroendocrine Disruption of Animal Vocalizations and Socio-Sexual Behaviors**
Chairs	**Maricela Luna**	**Natalia Garcia-Reyero and Vance Trudeau**	**Cheryl Rosenfeld and Frauke Hoffmann**

10:30-12:30	**Riesgo-Escovar, Juan** CHARACTERIZATION OF INSULIN PATHWAY MUTANTS IN DROSOPHILA *Álvarez-Rendón J, Riesgo-Escovar JR*	**Lutterschmidt, Deborah** MECHANISMS UNDERLYING TEMPERATURE-INDUCED REPRODUCTIVE BEHAVIOR: ARE OVERWINTERING ECTOTHERMS REALLY "DORMANT"? *Lutterschmidt DI, Lucas AR, Stratton K, Winters TJ*	**Rhodes, Justin** FEMINIZATION OF BEHAVIOR, PLASMA SEX HORMONE PROFILE, GONADAL HISTOLOGY AND BRAIN GENE EXPRESSION FROM ENDOCRINE DISRUPTION IN SEXUALLY LABILE ANEMONEFISH *Rhodes JS, Gonzalez JA, Lange DA, Bhuvanagiri SA, Kaur A, Parker CG, Rosenfeld CS, Martyniuk CJ, Denslow ND*
	Rotwein, Peter INSULIN-LIKE GROWTH FACTOR 2 THROUGH THE AGES: LOCUS AND GENE CONSERVATION AND DIVERSIFICATION DURING VERTEBRATE SPECIATION *Rotwein P*	**Cheung, Eugene** A POSSIBLE ROLE FOR LEPTIN IN SEXUAL MATURATION AND REPRODUCTIVE FUNCTION OF THE MOZAMBIQUE TILAPIA OREOCHROMIS MOSSAMBICUS *Cheung E, Tada MD, Borski RJ*	**Rosenfeld, Cheryl** DEVELOPMENTAL EXPOSURE OF CALIFORNIA MICE (PEROMYSCUS CALIFORNICUS) TO BISPHENOL A OR GENISTEIN AND EFFECTS ON THE GUT MICROBIOME, AND METABOLOME AND SOCIO-COMMUNICATIVE BEHAVIORS *Marshall BL, Liu Y, Farrington MJ, Mao J, Helferich WG, Schenk AK, Hoffmann F, Bivens NJ, Sarma SJ, Lei Z, Sumner LW, Joshi T, Rosenfeld CS*
	Vélez, Emilio SOMATOTROPE REGULATION: A NOVEL FUNCTION OF NUCLEOBINDIN ENCODED PEPTIDES? *Vélez EJ, Unniappan S*	**Khalid, Enezi** LIGAND-BIAS IN GOLDFISH PITUITARY GNRH RECEPTOR ACTIVATION: INVOLVEMENT OF BETA-ARRESTINS *Khalid E, Chang JP*	**Remage-Healey, Luke** NONCLASSICAL ACTIONS OF STEROIDS IN THE MODULATION OF VOCAL AND AUDITORY CIRCUITS IN SONGBIRDS *Remage-Healey L*
	Björnsson, Thrandur HOW OCEAN-WARMING COULD AFFECT GROWTH OF COLD-WATER MARINE TELEOSTS: GH-INDUCED STIMULATION OF ATLANTIC WOLFFISH GOWTH AT TEMPERATURES APPROACHING THE UPPER THERMAL TOLERANCE LIMITS *Björnsson BT, Gunnarsson A, Steinarsson A, Danielsdottir AK, Arnason T*	**Zmora, Nilli** CHALLENGING THE PARADIGM OF GNRH CONTROL OF REPRODUCTION: THE CASE OF GNRH3 IN ZEBRAFISH *Zmora N, Tanaka S, Marvel MM , Zohar Y*	**Zhang, Wo Su** NAPHTHENIC ACIDS DISRUPT COURTSHIP BEHAVIOURS IN THE WESTERN CLAWED FROG (SILURANA (XENOPUS) TROPICALIS) *Zhang WS, Farmer EJ, Trudeau VL*
	Epardo, David NEUROREGENERATIVE EFFECT OF GROWTH HORMONE (GH) IN THE CHICKEN NEURAL RETINA *Epardo D, Balderas-Márquez JE, Fleming T, Carranza M, Luna M, Harvey S, Arámburo C, Martínez-Moreno CG*	**Tanaka, Sakura** EXAMINING VASOACTIVE INTESTINAL PEPTIDE AS A POTENTIAL REPRODUCTIVE COMPENSATOR FOR HYPOPHYSIOTROPIC GONADOTROPIN-RELEASING HORMONE LOSS-OF-FUNCTION IN ZEBRAFISH *Tanaka S, Zmora N, Marvel M, Zohar Y*	**Hoffmann, Frauke** (NEURO)ENDOCRINE DISRUPTION OF AMPHIBIAN REPRODUCTIVE PHYSIOLOGY AND BEHAVIORS *Hoffmann F, Kloas W*
		Trudeau, Vance SECRETONEURIN IS A PEPTIDE HORMONE THAT RESCUES IMPAIRED SPAWNING IN ZEBRAFISH LACKING THE PRECURSOR PROTEIN SECRETOGRANIN-II *Trudeau VL, Mitchell K, Lu C, Hu W*	
12:30-14:00	**Lunch**		

Session Chairs	Advances in Endocrine Disruption Science Valerie Langlois and Jan Mennigan	Aspects of Reproductive Endocrinology & Neuroendocrinology 2 Vance Trudeau and Natalia Garcia-Reyero	GnRH-related Peptides in Metazoa: Recent Progress and Discoveries Jean-Paul Paluzzi and Pei-San Tsai
14:00-16:00	**Wiseman, Steve** INTRA-GENERATIONAL EFFECTS OF EARLY LIFE-STAGE EXPOSURE TO TEBUCONAZOLE ON REPRODUCTIVE CAPACITY OF ZEBRAFISH (DANIO RERIO) *Miller C, Ilnytskyy Y, Kovalchuk I, Wiseman S*	**Parker, Coltan** ACTIVE FEMINIZATION OF THE PREOPTIC AREA OCCURS INDEPENDENTLY OF THE GONADS IN AMPHIPRION OCELLARIS Dodd L, Nowak E, Lange D, Parker CG, DeAngelis RS, Rhodes JS	**Zandawala, Meet** CORAZONIN NEUROENDOCRINE PATHWAY ORCHESTRATES STRESS-ASSOCIATED PHYSIOLOGY IN DROSOPHILA *Zandawala M, Nguyen T, Johard H, Amcoff M, Paluzzi JP, Nässel D*
	Martínez López, Rubén Francisco DEVELOPMENTAL EXPOSURE TO FLUOXETINE REDUCES OFFSPRING BASAL CORTISOL CONCENTRATION VIA LIFE STAGE-DEPENDENT MATERNAL TRANSMISSION IN ZEBRAFISH *Martínez R, Vera-Chang MN, Haddad M, Zon J, Navarro-Martin L, Trudeau VL, Mennigen JA*	**Ai, Nana** EVIDENCE FOR ROLES OF ANGIOGENESIS IN FOLLICULOGENESIS OF ZEBRAFISH *Ai N, Zhu B, Ge W*	**Jones, Christopher** FROM ECHINODERMS TO HUMANS – EXPLORING THE EVOLUTION OF METAL-BINDING TO GNRH PEPTIDES. *Tran KK, Jayawardena BM, Peacey L, Elphick MR, Jones CE*
	Langlois, Valerie MOVING THE LAST DECADES OF ENDOCRINE DISRUPTION WORK INTO A PROVINCIAL ROUTINE SCREENING PROGRAM FOR COMPLEX EFFLUENTS *Langlois VS, Robitaille J*	**Jia, Yudong** INVOLVEMENT AND EXPRESSION OF GH/IGF SYSTEMS GENE IN THE OVARIAN DEVELOPMENT OF TURBOT *JIA YD, Meng Z, Huang B, Lei JL*	**Tsai, Pei-San** ADIPOKINETIC HORMONE IN A GASTROPOD: INSIGHT FROM LOCALIZATION AND FUNCTIONAL STUDIES *Tsai PS, Martillotti AW, Kavanaugh SI*
	Bhandari, Ramji EPIGENETIC REPROGRAMMING AND TRANSGENERATIONAL INHERITANCE OF EPIMUTATIONS IN MEDAKA *Bhandari RK, Wang X, Bhandari P, vom Saal FS, Tillitt DE*	**Williams, Marcus** GPER IN FEMALE ZEBRAFISH REPRODUCTION *Williams M, Wu X, Zhu Y*	**Paluzzi, Jean-Paul** INSIGHT INTO GNRH-RELATED NEUROPEPTIDE RECEPTOR SPECIFICITY REVEALED THROUGH ANALYSIS OF NATURALLY OCCURRING AND SYNTHETIC ANALOGS OF THIS NEUROPEPTIDE FAMILY
	Tubbs, Christopher GUT MICROBIOTA AND PHYTOESTROGEN-ASSOCIATED INFERTILITY IN SOUTHERN WHITE RHINOCEROS *Williams CL, Ybarra AR, Meredith AN, Durrant BS, Tubbs CW*	**Robitaille, Julie** STEROID-5ALPHA-REDUCTASE TYPE 2 KNOCK-OUT IN SILURANA TROPICALIS *Robitaille Julie, Langlois Valerie S.*	
	Heyland, Andreas TRANSGENERATIONAL REPRODUCTIVE EFFECTS OF TWO SEROTONIN REUPTAKE INHIBITORS AFTER ACUTE EXPOSURE IN DAPHNIA MAGNA EMBRYOS *Heyland A, Bastien T, Halliwushka K*		
16:00-18:00	**NASCE Council Meeting 2- Hawthorne**		
18:00-19:00	**Closing Ceremony and Student Awards Presentation +**		
19:00-10:00	**Closing Banquet (separate ticket required)**		

Posters

#1 Fu, Liezhen
LIGANDED THYROID HORMONE RECEPTOR ACTIVATES METHYL-CPG BINDING DOMAIN PROTEIN 3 (MBD3) THROUGH BINDING TO AN INTRONIC TRE DURING XENOPUS METAMORPHOSIS

Liezhen Fu, Wonho Na, and Yun-Bo Shi

#2 Koide, Emily
COLD HARD FACTS" ABOUT THE THYROID HORMONE-INDUCED MOLECULAR MEMORY OF RANA CATESBEIANA AT LOW ENVIRONMENTAL TEMPERATURES

Koide EM, Helbing CC

#3 Holloway, Nick
LOCALIZATION OF THE SODIUM-IODIDE SYMPORTER (NIS) IN THE BRAINS OF TELEOST FISH, AND ITS PROPOSED FUNCTION IN MAINTENANCE AND DEVELOPMENT

Nick Holloway, Duncan MacKenzie

#4 Dodsworth, Thomas
RECEPTOR IDENTIFICATION OF THE CRF-RELATED PEPTIDE, TENEURIN C-TERMINAL ASSOCIATED PEPTIDE (TCAP); RECEPTOR KNOCKDOWN BY SIRNA AND CRISPR/CAS9 METHODS

Dodsworth, T.L., Barsyte-Lovejoy, D., Hogg, D.W., Jurado Soria, F., Lovejoy, D.A.

#5 Lazcano, Iván
TRIIODOTHYRONINE AND 3,5-DIIODOTHYRONINE EXPOSURE SELECTIVELY AFFECT AXOLOTL METAMORPHOSIS PROCESS AND SPEED

Lazcano I, Villalobos P, Orozco A

#6 Pech Pool, Santiago
EFFECT OF HYPOTHALAMIC HORMONES UPON THE EXPRESSION AND RELEASE OF GROWTH HORMONE IN B LYMPHOCYTES FROM THE CHICKEN BURSA OF FABRICIUS

Pech SM, Berumen LC, Martínez-Moreno CG, García G, Carranza ME, Arámburo C, Luna M

#7 Nakajima, Ami
EVOLUTION OF TRANSTHYRETIN FROM 5-HYDROXYISOURATE HYDROLASE AFTER GENE DUPLICATION: WHAT HAPPENED TO AN ANCESTOR OF TRANSTHYRETIN?

Ami Nakajima, Kiyoshi Yamauchi

#8 Read, Casey
PEPTIDERGIC ACTIONS ON MITOCHONDRIAL ENERGETICS AND MOVEMENT: ROLE OF TENEURIN C-TERMINAL ASSOCIATED PEPTIDE-1

Read CC, Hogg DW, Sekh M, D'Aquila AL, Lovejoy DA

#13 Lajevardi, Aryan
FUNCTIONAL CHARACTERIZATION AND TISSUE-SPECIFIC EXPRESSION PROFILING OF TWO PYROKININ RECEPTORS IN ADULT AEDES AEGYPTI MOSQUITO

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#14 Li, Minghui
INSULIN LIKE GROWTH FACTOR 3, A TARGET OF ANDROGEN, IS REQUIRED FOR SPERMATOGENESIS IN TILAPIA

Li MH, Dai SF, Xiao HS, Liu XY, Zheng QY, Qi SS, Wang DS

#15 Carr, James
DO CATEGORICALLY DISTINCT STRESSORS AFFECT VISUAL ATTENTION TO FOOD IN HUMANS?

Li S, Keene JR, Harris BN, Carr JA

#16 Dai, Shengfai
AMHY DETERMINES MALE SEX VIA SIMULTANEOUS ACTIVATION OF GSDF AND REPRESSION OF FOXL2/CYP19A1A EXPRESSION IN TILAPIA

Dai SF, Liu XY, Xiao HS, Qi SS, Zhang XB, Li MH, Wang DS

#17 Honeycutt, Jamie
REGULATION OF LEPTIN BY GLUCOSE, CORTISOL, AND EPINEPHRINE IN TILAPIA (OREOCHROMIS MOSSAMBICUS)

Jamie L. Honeycutt, Courtney A. Deck, Jordan D. Taylor, Jonathan D. Douros, Russell J. Borski

#18 Brady, Fritzie
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Celino-Brady FT, Petro-Sakuma CK, Breves JP, Lerner DT, Seale AP

#19 Moleón, María Soledad
CORTICOSTERONE LEVELS AND IMMUNOLOGICAL STRATEGIES IN JUVENILE OF Caiman latirostris EXPOSED TO EXTREMES ENVIRONMENTAL CONDITIONS

Ma. Soledad Moleón, Ma. Virginia Parachú Marcó, Elisa O. Pietrobon, Graciela A. Jahn, Pablo M. Beldomenico, Pablo A. Siroski

#20 Bottalico, Lisa
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#21 Moore, Brandon
ANDROGEN RECEPTOR IMMUNOREACTIVITY LOCALIZATION IN HATCHLING AMERICAN ALLIGATOR CLITERO-PENIS

Brandon C Moore, Katie Wayne, Matt Hale, and Ben Parrott

#22 Lambert, Faith
ENDOCRINE DISRUPTING EFFECTS OF ORGANIC ULTRAVIOLET-FILTERS ON MOLTING AND DEVELOPMENT IN DAPHNIA MAGNA

Lambert FN, Vulpe CD

#23 Felton, Rachel
ACTIVATION OF CALIFORNIA CONDOR ESTROGEN RECEPTOR VARIANTS BY XENOESTROGENS

Felton R, Owen C, Cossaboon J, Steiner C, Tubbs C

#24 Lewis, Kelsey
THE ENDOCRINE DISRUPTOR VINCLOOLIN INDUCES PENILE MALFORMATIONS BY MODULATING APOPTOSIS IN THE GENITAL TUBERCLE

Kelsey Lewis, Zhengui Zheng, Lillian Svete, Marianne Kozuch, Mohammed-Zaman Nouri, Saunders Ching, Ophir Klein, Nancy Denslow, & Martin Cohn

#25 Bhandari, Ramji
BISPHENOL A AND 17ALPHA-ETHINYLESTRADIOL-INDUCED TRANSGENERATIONAL DIFFERENCES

Xuegeng Wang, Diamond Hill, Donald E. Tillitt, Ramji K. Bhandari

#26 Mayasich, Sally
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Sally Mayasich, Jeff Denny, Joseph Korte, Patricia Kosian, Jennifer Olker, Philip Degoey, Joseph O'Flanagan, Sigmund Degitz and Michael Hornung

#27 Ito, Michihiko
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#28 De Maria, Maite
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#30 Shahadur, Shohag
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Shahadur R. Sohag, Ondrej Adamovsky, Amy T. Hanlon, Pamela E. Ginn, Serena Craft, Amanda Buerger, Joseph H. Bisesi, Chris J. Martyniuk,

#31 Miyagawa, Shinichi
ELUCIDATION OF MOLECULAR MECHANISM UNDERLYING TEMPERATURE-SENSING DURING SEX DETERMINATION IN ALLIGATOR AND TURTLES

Hiroshi Akashi, Kenji Toyota, Satomi Kohno S, Taisen Iguchi , Shinichi Miyagawa

#32 Kurita Oyamada, Hajime
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#33 Balderas, Jerusa
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#35 Lee, Kevin
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#36 Bock, Samantha
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#37 CARDENAS, RODOLFO
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Trejo-Ramirez N, Chávez-Maldonado M, Cardenas-Reygadas R .

#38 Bruno, Renato
TESTOSTERONE AND VITELLOGENIN CONCENTRATIONS IN FREE-RANGING GREEN TURTLES (Chelonia mydas) SHOW POTENTIAL FOR SPECIES-SPECIFIC VARIATION AND SIZE-BASED TIMING OF GONADAL RECRUDESCENCE IN SEA TURTLES

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#39 Vélez, Emilio
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#40 Greville, Lucas
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#41 Urban, Valeria
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#42 Habibi, Hamid
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Ma Y, Ladisa C, Chang JP and Habibi HR

#43 Reid, Ross
VARIABLE ORGANISMAL GROWTH POTENTIAL CORRESPONDS TO DIFFERENTIAL GROWTH HORMONE SIGNALING MECHANISMS

Ross M Reid, Emilio J Velez, Mary N Latimer, Peggy R Biga

#44 Hall, Breanna
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Breanna Hall, Tariq Akhtar, Angela Lange and Andreas Heyland

#45 Gomez Pacheco, Liliana
PRODUCTION OF RECOMBINANT GREEN IGUANA (Iguana iguana) GROWTH HORMONE (GH)

Gómez-Pacheco L, Urban-Sosa V, Ávila-Mendoza J, Carranza M, Martínez-Moreno CG, Luna M, Arámburo C

#46 Herrboldt, Madison
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#47 Colli-Dula, Reyna C
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#48 Jia, Yudong
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#49 Freij, Khalid
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#50 Mita, Masatoshi
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Mita M, Osugi T, Takahashi T, Satake H

#52 Souders, Chris
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Souders II C, Wei C, Shahadur S, DiMaggio MA, Martyniuk CJ

#53 Nouri, Mohammad-Zaman
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Nouri MZ, Garcia-Reyero N, Kroll KJ, Denslow ND

#55 Wei, Chi
A COMPREHENSIVE, GENOME-WIDE ANALYSIS OF BRAIN AND GONAD TRANSCRIPTS REVEALS EXPRESSION CHANGES OF KEY SEX REVERSAL-RELATED GENES IN THREE STAGES OF MONOPTERUS ALBUS.

Chi Wei, Gao Yu, Hu Qing, Guo Wei, Li Dapeng

#56 Veloz Contreras, Arlet
Effect of mice Taenia crassiceps WFU cysticerci infection on the ovarian folliculogenesis, enzyme expression and serum estradiol

A. Veloz, M.C. Romano

#58 Zhang, Hugh
CAGE ENRICHMENTS NEGATIVELY IMPACT THE REPRODUCTIVE BRAIN IN MALE MICE

Zhang HS, Tsai PS

#60 Wosnick, David
AEROBIC METABOLISM IN NEURONS AND ASTROCYTES UNDERGOING CELLULAR STRESS: MODULATION BY TENEURIN C-TERMINAL ASSOCIATED PEPTIDE-1 (TCAP-1)

David Wosnick, Ola Michalec, Aishwarya Chand, Gina Trubiani, Tiffany Ng, David W. Hogg, David A. Lovejoy

Explore Gainesville

The University of Florida: A Preeminent Academic Institution

Albert and Alberta, the Florida Gator Mascots

In 1858, James Henry Roper, an educator from North Carolina and a state senator from Alachua County, opened a school in Gainesville: the Gainesville Academy. In 1866, Roper offered his land and school to the State of Florida in exchange for the relocation of the East Florida Seminary to Gainesville and the University of Florida (UF) was born. Since the founding of UF over 160 years ago, it has become the state of Florida's largest university and is currently the home for more than 60,000 undergraduate and graduate students, and over 5000 faculty. The UF is the largest and oldest university in the state and is the 6th largest university campus by enrollment in the USA. The UF includes 16 colleges that include the Colleges of Medicine, Dentistry, Veterinary Medicine, Food and Agricultural Science, Liberal Arts and Sciences, Law, and Business among others. There are more than 150 research centers and institutes associated with UF, including the McKnight Brain Institute, Cancer and Genetics Institute, Emerging Pathogens Institute, Center for Environmental and Human Toxicology (CEHT), and the Clinical and Translational Science Institute. It is a dynamic and thriving academic institution that is driving to be ranked one of the top 10 Universities in the country. To achieve this goal, the University has undergone Preeminent Recruitment, an initiative that has enticed some of the top researchers nationally and internationally to the university (>250 Preeminent Scholars) http://ufpreeminence.org/focus-areas/. The University is also home to approximately 40 National Academy of Science Fellows and is a hub for research excellence and leadership across a number of disciplines.

Ben Hill Griffin Stadium (top photo), the Clinical and Translational Science Institute (left photo) and the Century Tower on campus (right photo).

The campus is large and diverse, with a perfect blend of new and old. There are many historic buildings on campus that give it an "ivy league" campus feel, intermingled with modern. Ben Hill Griffin Stadium is the home of the Florida Gator football team, a 95,000 seat football stadium on campus within walking distance to the conference location. It is an impressive site to see. There are also a number of trails on campus, and Lake Alice is at the center of campus and is a very pleasant wildlife area. The dirt path and short boardwalk on the lake's north side meander through the woods, where a variety of wetland plants, birds and alligators can be seen. Other trails on campus

include the Upland Pine Trail (0.3-mile) that includes pines and wildflowers in spring; the Old Field Trail (0.3-mile) with abandoned agricultural fields, and the Hammock Trail (0.25-mile) with a variety of flowering plants. Although large and bustling with students, the campus retains that "Natural Florida" feel that the state is well known for (i.e. extensive wetlands and forest). The University of Florida Bat Barn also sits close to Lake Alice. The Bat House and Bat Barn were built to relocate bats from other structures on the UF campus. The Bat House was constructed in 1991 and rebuilt internally in 2009; the Bat Barn was added in 2010. The bat house contains species that include the Brazilian free-tailed bat, Tadarida brasiliensis but also is home to The Southeastern bat, Myotis austroriparius, and Evening bat, Nycticeius humeralis. Each evening, one can sit and watch 300,000 bats swoop out of their home and consume nearly 2.5 billion insects in the warm evening light. Conference attendees will enjoy this experience on campus. There is an excellent public transport system that runs throughout campus, making all of these locations accessible. Walking from one end of campus to another is also feasible and would take approximately 45 min. if conference-goers preferred to explore the many trails and sites on campus.

UF Bat Barn that houses 300,000 bats.

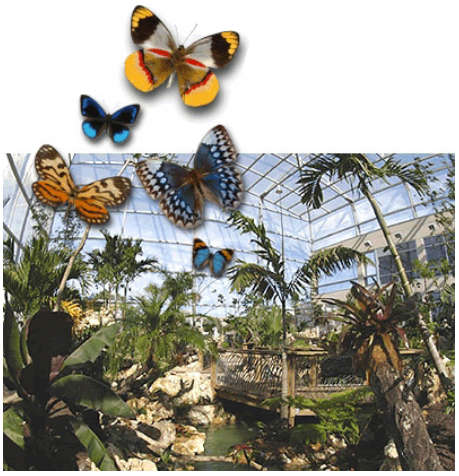
Gainesville: A Multi-Cultural City with Southern Charm

Gainesville is the largest city and the county seat in Alachua County, and has a population of approximately 130,000. It is the quintessential "College Town" with a dynamic and growing population. Downtown is very quaint and historic (approx. 5 min cab ride from campus), and is home to the Hippodrome (Performing Arts Center) and a number of unique shops and cafes. There are many options for restaurant dining and to enjoy warm evening weather on a patio. Downtown Gainesville offers a multicultural array of dining experiences, including Dragonfly Sushi & Sake Company, serving contemporary izakaya and tapas-style Japanese pub fare, the OAK (aka Original American Kitchen) for those seeking American-style cuisine and assortment of micro-brewed products, Emiliano's Cafe serving Latin fusion fare ranging from Mexican to Spanish, as well as specialty beverages such as mojitos, and Harry's Seafood bar and Grille which features Cajun, Creole & Southern cuisine in a friendly atmosphere. Conference attendees will enjoy the evening in downtown Gainesville, and may be fortunate enough to catch one of the many free music concerts at Bo Diddley Plaza, which features local blues and jazz artists.

Hippodrome (left photo), evening in Gainesville (center photo), and Bo Diddley Square (right photo)

Additional Sites in Gainesville.

Florida Museum of Natural History: One of the nation's largest and fastest-growing natural history museums on the UF campus in Gainesville. But the Museum is more than facilities and a repository for millions of specimens and artifacts. Our faculty, staff, part-time employees and volunteers are passionately committed to learning and communicating to others the fascination we share for our natural and cultural worlds. Museum researchers investigate bird extinctions on Pacific islands, excavate shell mounds on the Southwest Florida coast, document shark attacks worldwide, monitor endangered and threatened species such as the Florida panther and the manatee, and explore the genetic codes relating families of tropical orchids. Their findings are shared through scholarly publications, university courses, public lectures, museum exhibits and K-12 education programs.



The Butterfly Exhibit, features dozens of species both exotic and rare

The Samul P. Harns Museum of Art on campus contains an impressive and diverse collection of art that includes the African Collection and Wood Sculptures, and the Asian Collection with Jades, Metalwork, and Stone Sculptures. The Modern Collection includes paintings, sculpture, and drawings featuring painting from Monet and Van Gogh. The Contemporary Collection presents work form a number of internationally acclaimed artists. Also presented are Multi-media, Painting, Photography, Installation and Film

Samul P. Harns Museum of Art

Home of Gatorade and the Cade Museum The Cade Museum for Creativity + Invention is named for Dr. James Robert Cade, a professor of renal (kidney) medicine at the University of Florida and the lead inventor of the sports drink Gatorade. This museum is 5 minutes from campus and offers interactive science and art activities for childer. http://www.cademuseum.org/

The Cade Museum, an excellant visit for family activities