





## 6th ISWE CONFERENCE

14-16 August 2017

### FINAL PROGRAM



15.00-15.15

#### Lightning talks (3 talks, 5 min. each, 10 slides max., no questions)

1. A fast high-performance liquid chromatography method as a potential tool for assessing fecal estrogen concentrations in jaguars (*Panthera onca*). Conforti, Valéria.
2. It's not all black and white: urinary oestrogens as an implantation marker in the Giant Panda (*Ailuropoda melanoleuca*). Wilson, Kirsten.
3. Noninvasive monitoring of glucocorticoid levels in endangered cats in Russia. Dr. Naidenko, Sergey.

15.15 - 16.15

#### COFFEE BREAK & POSTER SESSION (Coronado Ballroom L)

16.15 - 17.15

#### Session 4 (ANIMAL HEALTH AND WELFARE)

1. An evaluation of the relationship between serum testosterone and cortisol levels and *Toxoplasma gondii* infection in wild Eastern quolls (*Dasyurus viverrinus*). Keeley, Tamara.
2. Fecal glucocorticoid metabolite monitoring in kea (*Nestor notabilis*) during Avian Bornavirus outbreaks at the Cincinnati Zoo and Botanical Garden. Donelan, Elizabeth.
3. Are we overestimating the utility of hair glucocorticoids? Early findings from a systematic review in progress. Dr. Kalliokoski, Otto.

17.15-17.30

#### Lightning talks (3 talks, 5 min. each, 10 slides max., no questions)

1. A pilot study of methods for measuring oxytocin in giraffe urine and its potential as an indicator of positive welfare. Fuller, Grace.
2. Comparative evaluation of gestation in three rhinoceros species (*Diceros bicornis*; *Ceratotherium simum*; *Rhinoceros unicornis*). Schwarzenberger, Franz.
3. Physiological stress response in *Tamandua tetradactyla* to anthropogenic disturbances: management recommendations to preserve animal welfare in zoos. Busso, Juan.

19.30 - 22.00

#### WELCOME RECEPTION/ICEBREAKER (Coronado Ballroom L)







INTERNATIONAL  
SOCIETY of WILDLIFE  
ENDOCRINOLOGY

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15.15 - 16.15 **COFFEE BREAK & POSTER SESSION (Coronado Ballroom L)**

16.15 - 17.15 **Session 8 (METHODOLOGIES)**

1. Volatile and non-volatile bioindicators related to reproductive status in giant panda urine (*Ailuropoda melanoleuca*). Dehnhard, Martin.
2. Testosterone in ancient hair from an extinct species. Koren, Lee.
3. Interpreting statistical differences in bison (*Bison bison*) fecal glucocorticoid metabolite concentrations. Metrione, Lara.

17.15-17.30

**Lightning talks (3 talks, 5 min. each, 10 slides max., no questions)**

1. The alternative application of urinary specific gravity for the normalisation of endocrine metabolite concentrations in giant panda (*Ailuropoda melanoleuca*) reproductive monitoring. Wauters, Jella.
2. The ecological tipping point: wild cotton-top tamarins respond to ecological factors, habitat loss, and fragmentation with altered reproductive patterns and success. Feilen, Katie.
3. Monitoring reproductive status of female tarsier (*Tarsius tarsier*) based on fecal steroid metabolite measurements. Agil, Muhammad.

19.30 - 21.30 **MEETING DINNER at Disney's Coronado Springs Resort, Monterey 2-3 & La Fiesta Patio.**

**Wednesday August 16th. Disney's Coronado Springs Resort, Coronado Ballroom L.**

8.00 - 13.30 REGISTRATION and information desk

7.30 - 9.00 **BREAKFAST BUFFET (Coronado Ballroom L)**

9.00 - 10.00 **WORKSHOP: Introduction to quantitative analysis of wildlife hormone data using R.**  
Pete Laver, Mandi Schook.

**BREAK**

10.00 - 11.00 **WORKSHOP: Assay validation: Identifying areas of uncertainty in conducting validation studies.**  
Meredith Bashaw, Janine Brown, Rupert Palme, Kerry Fanson.

**BREAK**

11.00 - 12.00 **WORKSHOP: Working with WEIN.**  
Edward Wilkerson, Rachel Santymire

12.00 - 13.00 **BUFFET LUNCH (Coronado Ballroom L)**

13.00 - 13.30 **POSTER PRIZE ANNOUNCEMENT- CLOSING CEREMONY**

13.30 **RELEASE TO ZOO DAY**





## PLENARY SPEAKERS



Dr. Tyrone B. Hayes is a biologist, herpetologist and professor of the Department of Integrative Biology at the University of California, Berkeley.

His research focuses on the role of steroid hormones in amphibian development including growth, metamorphosis, sex differentiation and hormonal regulation of aggressive behavior. He conducts both laboratory and field studies in the U.S. and Africa and currently, his work also examines the effects of exogenous steroids on gonadal differentiation and the potential role of endogenous steroids. His main goal is to understand how an animal translates changes in its external environment to internal changes, how these internal changes are coordinated, what molecular mechanisms are involved, and in turn, how changes at the molecular level affect an animal's ability to adapt to the changes in its external environment.

Dr. Hayes became well known for his research findings concluding that the herbicide atrazine is an endocrine disruptor that feminizes male frogs, warning the scientific community about how synthetic chemicals that interact with hormones can alter developmental responses, and play a role in the global amphibian decline, and how these studies predict effects in humans and wildlife.



Dr. Gelsleichter is an Associate Professor of Biology in the Department of Biology at the University of North Florida.

His research programs focuses on three major topics: the ecology of shark populations in northeast Florida waters, the reproductive biology and physiology of shark and their relatives and the effects of environmental pollutants on sharks and other fish species.

These three research areas are highly interrelated and research is also integrated with the study of how hormones regulate various aspects of shark reproduction.

Finally, his research also expands to the study of shark populations and other fish exposed to environmental pollutants such as mercury, industrial chemicals and oil that are experiencing health effects that could impair their reproduction, survival, and overall population stability.

# WORKSHOPS

## INTRODUCTION TO QUANTITATIVE ANALYSIS OF WILDLIFE HORMONE DATA USING R.

Leaders: Pete Laver, Mandi Schook.

This will be an interactive workshop designed to provide researchers an entry into quantitative analysis of hormone data using the R language and software platform. We will discuss various quantitative approaches specific to wildlife endocrinology as well as more general approaches to statistics.

We will interactively step through some basic analysis of hormone data using R and RStudio, and briefly work together on topics such as descriptive statistics (including frequency distributions), power analysis and study design, frequentist statistics (parametric and nonparametric), Bayesian statistics, and information theoretic approaches. Participants should come away with a better understanding of the general approaches they can take, an improved quantitative vocabulary for discussing their data with a statistician, and the tools necessary for finding further information and help. All participants will be expected to bring their own laptops with relevant software pre-installed (instructions for this will be sent to participants in the weeks prior to the workshop).



## ASSAY VALIDATION: IDENTIFYING AREAS OF UNCERTAINTY IN CONDUCTING VALIDATION STUDIES.

Leaders: Meredith Bashaw, Janine Brown, Rupert Palme, Kerry Fanson.

Proper validation of an assay is essential in order to gain meaningful insights from excreted glucocorticoid metabolite (GCM) data. However, anyone who has conducted a validation study has likely been faced with challenging decisions about experimental design, assay selection, and data analysis.

These challenges are exacerbated by the fact that many of us are dealing with sensitive species in zoos or in the wild. Although there are many papers that discuss the importance of validation and some of the factors to consider, there are still several aspects of the validation process where questions abound. The purpose of this workshop is to identify key questions and uncertainties about conducting validation studies, with a focus on the assay of GCM in urine and feces. We will draw on case studies, published papers, and personal experience to understand how different methodological approaches can influence the outcome or interpretation of a validation. Participants will be asked to identify and rank questions they have about validation studies with the aim of highlighting key knowledge gaps, from sample collection through to data analysis. This workshop is the first part of a long-term project to develop a set of well-researched guidelines, backed by empirical evidence, about the do's and do not's of validation studies.



## WORKING WITH WEIN.

Leaders: Edward Wilkerson, Rachel Santymire.

The Wildlife Endocrinology Information Network (WEIN) is a web based, searchable data network containing information on the endocrine methods and analyses including sample type, sample processing, hormone assays and endocrine results on various domestic and wildlife species both in situ and ex situ. The database allows the sharing of information regarding endocrine monitoring in a given species and is a reference place for endocrinological techniques and species based information.

The goal of WEIN is to become the primary resource for researchers worldwide to learn, analyze, and share information about the growing field of wildlife endocrinology. WEIN will provide a venue for techniques and data that are not publishable, creating a critical resource for people interested in zoo and wildlife health and conservation.

In this workshop, you will be introduced to WEIN. We will take you step by step on how to search and extract information, entering and submitting a project and reviewing a project. Finally, we will discuss the future of WEIN and how it can evolve with the needs of our membership.





# POSTER PRESENTATIONS

## METHODOLOGIES

- 1 Trials and tribulations of measuring fecal testosterone and glucocorticoid metabolites in male western lowland gorillas. Boisseau, Nicole.
- 2 Measurement of feather cortisone in carmine bee-eaters (*Merops nubicus*): a noninvasive approach to measuring physiological health and well-being in birds. Alba, Andrew.
- 3 Validation of a fecal glucocorticoid metabolite (FGM) assay and field extraction methods to monitor welfare of mandrills (*Mandrillus sphinx*) reintroduced into Republic of Congo. Dr. Lavin, Shana.
- 4 Validation of non-invasive stress hormone monitoring in *Tropidurus spinulosus*, an endemic lizard from Argentina and Brazil. Dr. Busso, Juan.
- 5 Effect of fecal sample moisture content on extraction efficiency and progesterone concentration in Red River Hog (*Potamochoerus porcus*). Goblet, Camille.
- 6 Analysis of reproductive steroid hormones in captive two-toed sloths (*Choloepus hoffmanni*) using the automated immunoassay analyzer AIA-360®. Dr. Castro Ramirez, Laura.
- 7 Statistics in wildlife endocrinology: A review of current practice and recommendations for future directions. Dr. Laver, Peter.

## REPRODUCTION

- 8 "One-Shot" immunocontraception for population control in free-ranging Capybara – a South-American mammalian species - *Hydrochoerus hydrochaeris*. Dr. Rosenfield, Derek.
  - 9 Case Study: Non-invasive Assessment of Puberty and Pregnancy Status in African Lions. Dr. Swanson, William.
  - 10 Administration of biorelease progesterone and estradiol or GnRH induce estrous cycles and breeding in anestrus African white rhinoceroses (*Ceratotherium simum simum*). Stoops, Monica.
  - 11 Androgens in Tapirs (*Tapirus terrestris*). Cerqueira de Paula Tessari, H.
  - 12 Chemical contraceptive impacts on cyclic progesterone and sexual behavior in captive Western lowland gorillas. LeFauve, Matthew.
  - 13 Determination of reproductive state in female Hartmann's mountain zebra (*Equus zebra hartmannae*) using fecal progesterone and estradiol. Michelle Wood.
  - 14 Characterizing the reproductive biology of the female pygmy hippopotamus (*Choeropsis liberiensis*) through non-invasive endocrine monitoring. Dr. Flacke, Gabriella.
  - 15 Validation of non-invasive fecal reproductive hormone assays for the northern fur seal (*Callorhinus ursinus*). Graham, Katherine.
  - 16 Endocrine monitoring of pair bond strength in captive whooping cranes. Brown, Megan.
  - 17 Fecal testosterone monitoring in eastern diamondback rattlesnakes (*Crotalus adamanteus*). Daly-Crews, Kim.
  - 18 Reproductive characteristics of female waterbuck (*Kobus e. ellipsiprymnus*). Dr. Morrow, Catherine.
  - 19 Patterns of estrogen metabolites and color change in female white-cheeked gibbons. Dr. Margulis, Susan.
  - 20 Linking plasma sex-steroid levels to the condition of external genitalia in European badgers (*Meles meles*): A critical evaluation of traditional field methodology. Sugianto, Nadine A.
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- 21 Discovering the reproductive physiology of Arabian Tahr (*Arabitragus jayakari*) (Thomas, 1894) through non-invasive endocrine monitoring. Dr. Antunes Dias, Eduardo.
- 22 Higher levels of cortisol in-utero in nutria even-sex-ratio litters Fishman, Ruth
- 23 Noninvasive endocrine monitoring of reproduction based on breeding records in Indian mouse deer (*Moschiola indica*). Kumar, Vinod.
- 24 A preliminary investigation for using olfactory stimulation as a method for improving cyclicity in captive female African black rhinos. Dr. Bickley, Stacie.
- 25 Sex differences in hypothalamic-pituitary-gonadal axis response in wild gerbils. Sarid, Shani.

## STRESS

- 26 Monitoring individual differences in adrenal responses to varying handling regimens in African pygmy hedgehogs (*Atelerix albiventris*). Dr. Scarlata, Candace.
- 27 Preliminary validation of a fecal glucocorticoid metabolite assay in seed-finch, *Sporophila angolensis*. Barbosa, Heriberto.
- 28 Serum and faecal corticoids in Tapirs (*Tapirus terrestris*). Matias Soares, Andrea Ariane.
- 29 Fecal testosterone and aggression in the blue-billed curassow (*Crax alberti*). Dr. Penfold, Linda.

## ANIMAL HEALTH AND WELFARE/ MISC.

- 30 Validating new methods for quantifying glycemic response and cellular metabolism in African Elephants. Berkeley, Beaux.
- 31 Using serum biomarkers to assess the health of African and Asian elephants. Dr. Edwards, Katie.
- 32 Assessing welfare of zoo-housed cheetahs (*Acinonyx jubatus*) in different management roles using fecal hormone metabolites. Baird, Bonnie.
- 33 Are zoo-housed collared anteaters (*Tamandua tetradactyla*) experiencing well-being?: seasonal assessment of basic health and serum cortisol. Dr. Busso, Juan.
- 34 Factors affecting whole-body metabolism in the male giant panda. Kersey, David.