



# ISWE Newsletter

Volume 9: Oct 2021

## International Society of Wildlife Endocrinology (ISWE) newsletter: Volume 9

In this edition, we highlight ISWE's first virtual conference, spotlight Dr. Santamaria's research on koalas, and share some recent publications from our members.

***Want to contribute?*** We are always seeking newsletter content including: photos, announcements, and publications.  
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Thanks from the newsletter committee!

*Katie Graham, Grace Fuller,  
Katie Fowler, Elizabeth  
Freeman, Tina Dow and Laura  
Amendolagine*

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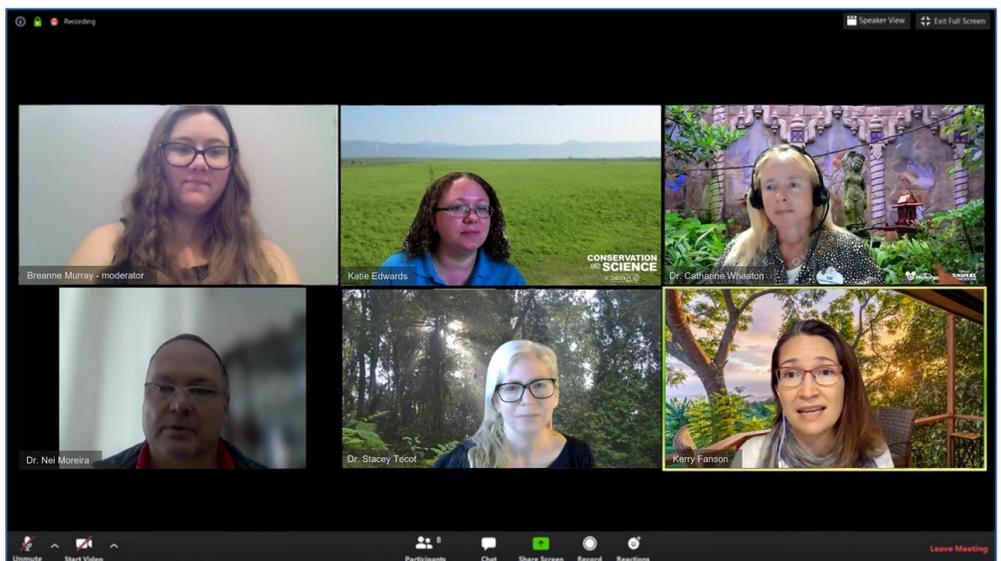
[International Society of Wildlife  
Endocrinology-ISWE](#)

## ***ISWE Holds Virtual Event, a First for the Society***

When the ISWE board made the difficult decision to postpone ISWE 8 in India, it was clear that the growing, collaborative society could not wait years to meet again. Conference Chair Diana Koester and her team stepped up to the challenge and planned the Society's first-ever virtual meeting for August 16-17, 2021. With the generous support of sponsor Arbor Assays, a total of 130 participants took part in ISWE's inaugural virtual event.

Given the importance of networking opportunities for building a research career, the Board decided to focus heavily on trainees for the virtual event. Participants had the opportunity to view pre-recorded research presentations for a month surrounding the event, and 43 of 63 presentations were submitted by students—almost 70%! Of these, 34 trainees entered the travel award contest, in which two winners were selected to receive support for attending ISWE 8 in India.

The two days of the virtual event were packed with online activities. Following an opening session and board update, a panel of Indian wildlife researchers shared their latest discoveries. Many of these talks actively addressed current conservation challenges in India, highlighting the research (and animals) that ISWE members can expect to see more of when ISWE 8 is held at Jim Corbett National Park in 2023. The second panel of the day convened experts from a variety of backgrounds (and four countries) to discuss applications of measuring glucocorticoids—and challenges. [cont'd pg 2]



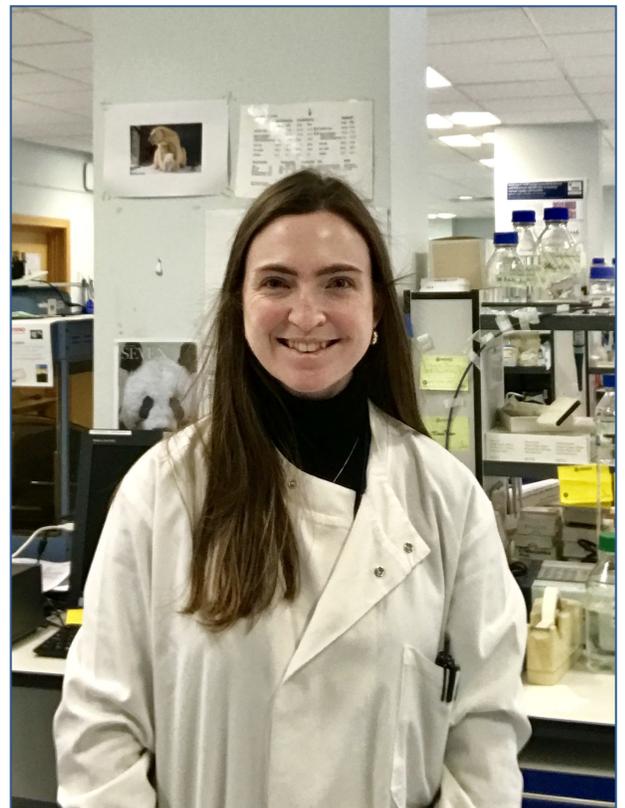
## ***ISWE Virtual Event [continued]***

On day two, the plenary session continued this theme, with a thought-provoking presentation by Dr. Michael Romero of Tufts University about the promises and pitfalls of measuring glucocorticoids in wildlife to understand ecology and conservation. The second day of the event also included a trainee-mentor networking session. Dedicated senior scientists in ISWE donated their time to the next generation, and most of the mentors met with several trainees to offer advice on building a career in wildlife research.

At the final session of the event, the Board announced the news everyone was waiting for: the winners of the travel awards. Katherine Fowler of the University of Illinois at Chicago won the top prize for her presentation on novel field methods for preserving African lion feces. Her objective was to determine the stability of corticosterone (Arbor Assays #K014) and testosterone (antibody R156/7, Coralie Munro, UC Davis, USA) metabolites for male and female samples: 1) when exposed to the natural environment and 2) in silica beads at ambient temperatures. She found that silica beads can be used to preserve fresh lion fecal samples for up to 10 days at ambient temperatures before long-term freezer storage.

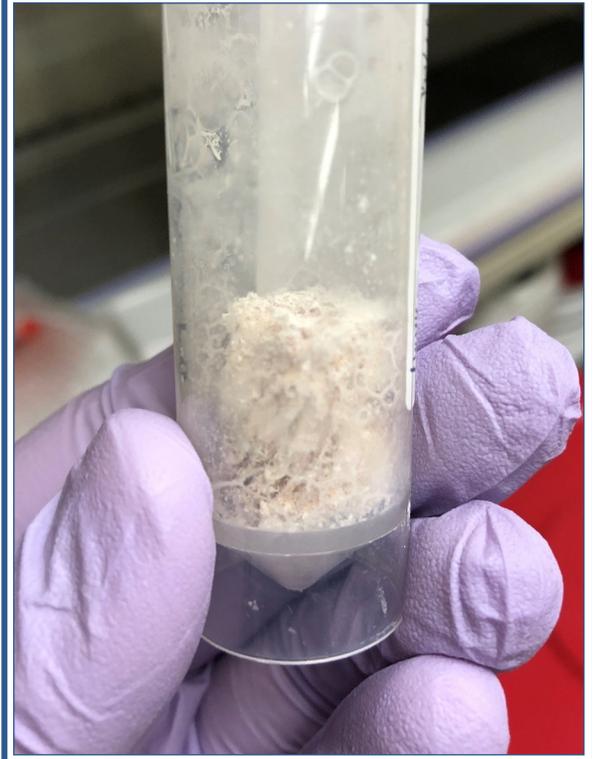
Kirsten Wilson of the University of Edinburgh received the runner-up travel award, which was sponsored by Arbor Assays. For her doctoral research, she is exploring biomarkers of giant panda reproduction. This species has only two days a year to get pregnant, so there is a need for biomarkers to provide the most advanced warning of impending estrus. In this talk, Wilson shared her latest research looking into the novel use of androgens to optimize estrus detection. [story cont'd pg 5]

**Travel award winners: Katherine Fowler, University of Illinois at Chicago (below) and Kristen Wilson, University of Edinburgh (right)**



## ***Guess Whose Poo?***

Can you “guess whose poo”? Check out the picture below, and see if you can correctly identify the poo. [Answer page 5]



## Lab in the Spotlight: *Koala Research-CQ*

Dr. Flavia Santamaria shares with us the exciting new koala research program at Central Queensland University, Rockhampton, Queensland, Australia which aims to study glucocorticoids in this unique Australian marsupial.



*Dr. Flavia Santamaria proudly shows off a koala fecal sample!*

### Tell us about your program.

Dr. Santamaria: Koala Research-CQ is a koala health and ecology research program based at Central Queensland University (CQU) in Rockhampton. Our work on koala fecal cortisol metabolites recently started, so currently, there are only two full time staff in the lab in Rockhampton—myself and Dr. Rolf Schlagloth. We are expanding our research capability with PhD students, as our work is steadily increasing.

We process our samples in the lab at CQU and at this stage of the project, we are collaborating with Dr. Rupert Palme at the University of Veterinary Medicine, Vienna, Austria for EIA analysis of the extracts we generate. However, the best part of my work has so far taken place in wildlife parks, wildlife hospitals and now in the field, waiting for koalas to deliver their fecal samples, nice and fresh.

### What is your current project?

At this stage we are exclusively focused on detecting stress in koalas using non-invasive methods, specifically by measuring fecal cortisol metabolites (FCMs) in populations of koalas throughout the large state of Queensland. While the study, so far, has been carried out on koalas in captivity in

South-East Queensland, we are now focused on working with wild koala populations throughout Central Queensland, broadening our research to include various health aspects.

### What makes your job unique?

Koalas are an arboreal endemic Australian species. Although found in many zoos around the world, Australia is where these unique animals exist in the wild. I am absolutely privileged to be working to protect koalas from extinction. Knowing if anthropogenic activities are causing stress, using a non-invasive method of detection, is a way to assist policy makers and conservation officers in their efforts to protect koalas.

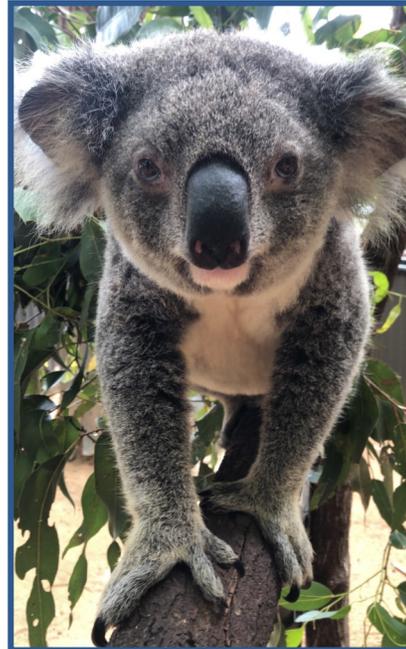


*Freshly collected koala feces!*

### Any recent publications to highlight from your lab?

Santamaria, F; Palme, R; Schlagloth, R; Klobetz-Rassam, E; Henning, J. 2021. Seasonal variations of faecal cortisol metabolites in koalas in south east Queensland. [Animals 11, 1622](#).

Santamaria, F; Barlow, CK; Schlagloth, R; Schittenhelm, RB; Palme, R; Henning, J. 2021. Identification of koala (*Phascolarctos cinereus*) faecal cortisol metabolites using liquid chromatography-mass spectrometry and enzyme immunoassays. [Metabolites 11, 393](#).



*Arlo, the koala.*

### Are you interested in pursuing collaborations within ISWE?

I am very interested in collaborating to write research papers on FCM levels in koalas held in overseas institutions (zoos and/or parks) using our latest validated EIA.

### Any funny or exciting stories from the field?

During our 96 hour fecal collection for the study phase that identified the FCM, we slept inside the car in the proximity to the koala enclosure in the zoo grounds and one of us was on guard to spot any defecation (fortunately emanating the pleasant aroma of *Eucalyptus* oils) and urination which were very frequent at night. As koalas and other animals in the zoo are nocturnal, calls and grunts ensured that none of us could enjoy much sleep. By the end of the collection, we decided to spoil ourselves with a stay at a 'luxurious' B&B.

Our "Lab in the Spotlight" feature highlights teams in the ISWE community. Want your lab to be in the spotlight? Email us at: [iswe.socialmedia@gmail.com](mailto:iswe.socialmedia@gmail.com)

## Recent Publication Highlights:

The “Publication Highlights” section offers brief summaries of recent publications by ISWE members. If you’d like to see your article in an upcoming newsletter, send us the citation and a photo showing your work in action. All submissions welcome (email: [ISWE.socialmedia@gmail.com](mailto:ISWE.socialmedia@gmail.com))!

### In utero accumulated steroids predict neonate anti-predator response in a wild mammal

A novel study creatively connects two timely areas of wildlife ecology, hormone analyses of keratinized products and individual temperament assessments. Experience and learning shape individual variability in behavior; thus, temperament studies focus upon subadults or adults. Behavioral phenotypes such as boldness, play and aggressiveness are influenced by cortisol and testosterone, which also play major roles in fetal maturation. Thus, Amin *et al.* studied a population of free-ranging fallow deer (*Dama dama*) in a Dublin park (2018-19) to examine the relationship between accumulated hair cortisol and testosterone hormone concentrations in neonatal hair and the coping responses of fawns to capture and handling (a proxy for anti-predator behavior). Fallow deer fawns are predominantly on their own the first three weeks of life and adopt a hiding anti-predator strategy. Therefore, any variations in neonate behavior are likely due to intrinsic differences in temperament rather than social experiences. The authors captured 185 fawns, shaved their belly hairs (>100mg) and monitored their response to routine tagging procedures as well as other physiological measures (e.g., heart rate). Hormones were extracted from the hairs using a methanol sonication and overnight shaking method; cortisol and testosterone concentrations were measured with Salimetrics enzyme immunoassay kits. In utero accumulated steroid concentrations were associated with inter-individual differences in coping behaviors. Low cortisol and high testosterone concentrations were associated with reduced fawn fearfulness, indicated through lower heart rates and a longer latency to leave after handling. Results demonstrated that behavioral differences were present within a few days of birth and were associated with the in utero environment. These temperament differences could impact neonate survival and responses to predators and anthropogenic threats. Future research should investigate the pathways for accumulation of hormones in neonate hair (fetal versus maternal) as well as how in utero hormones shape individual behavior.



Amin B, Jennings DJ, Smith AF, Quinn M, Chari S, Haigh A, Matas D, Koren L, Ciuti S (2021) In utero accumulated steroids predict neonate anti-predator response in a wild mammal. *Funct Ecol.* 35:6, 1255-1267. doi: [10.1111/1365-2435.13790](https://doi.org/10.1111/1365-2435.13790)

Photo credit: Functional Ecology cover image



### Effects of faecal inorganic content variability on quantifying glucocorticoid and thyroid hormone metabolites in large felines: Implications for physiological assessments in free-ranging animals

Faecal hormone metabolites are commonly used as a non-invasive way to monitor physiological responses such as stress, nutrition, and reproductive status in free-ranging and captive animals. Assessing changes in metabolite concentrations in response to life events, and their interactive effects, allows researchers and wildlife managers a basis on which to make informed decisions on husbandry and conservation. Faecal material contains both organic and inorganic matter. Previous research confirms it is the organic material that contains the endocrine-derived metabolites. Wildlife can ingest inorganic material, i.e., soil, for a variety of reasons including nutrient supplementation and accidentally while feeding. Recently, Patel *et al.*, examined the influence of inorganic matter (IOM) on faecal glucocorticoids (fGCMs) and triiodothyronine (ft3Ms) metabolites in captive Asiatic lions and wild tigers in the Terai-Arc landscape in India. The group hypothesized that high IOM content in faecal samples could have negative ramifications on analysis and data interpretation. As such, the group analyzed samples for metabolites, quantified the amount of IOM in each, and investigated the influence on the concentrations of fGCMs and ft3Ms and subsequent data explication. In addition, if there were significant changes, they formulated possible corrective measures to mitigate inaccuracies in future samples thereby eliminating error.

As anticipated, wild tiger samples contained varying IOM content compared to captive Asiatic lions. Interestingly, significant correlations between IOM and wild tiger fGCMs and ft3Ms, and captive lion ft3Ms were documented. Corrected measures were applied to minimize IOM content inconsistencies between samples and the influence IOM has on analysis and data interpretation. To mitigate the issues, the group removed samples that were observed to contain 80% IOM and utilized a per gram of organic dry material measurement over the previously used total dry matter. In doing so, they observed a reduced IOM influence on ft3M data of wild tigers. There were no significant changes when applying the new laboratory techniques for captive lion ft3M and fGCM or wild tiger fGCM data interpretation.

Patel SK, Biswas S, Goswami S, Bhatt S, Pandav B and Mondol S (2021) Effects of faecal inorganic content variability on quantifying glucocorticoid and thyroid hormone metabolites in large felines: Implications for physiological assessments in free-ranging animals. *Gen Comp Endocrinol* 310:113833. doi: [10.1016/j.ygcn.2021.113833](https://doi.org/10.1016/j.ygcn.2021.113833)

## ***ISWE Virtual Event [continued]***

Although nothing can replace an in-person meeting (or a fireside dance at a South African bushbraai with hyenas circling in the darkness), the virtual event had one bright side. Participants in the event represented 18 countries, and the event truly showcased the impactful, novel work that the next generation of scientists are bringing to the field. On behalf of the ISWE Board, we look forward to meeting with you in India in 2023!

### **ISWE Virtual Event by the Numbers**

Attendees	130
Countries represented	18
Presented abstracts (recorded)	63
All student submissions	43
ISWE Students for Travel Award judging	32
Panel sessions	2
Plenary speakers	1
Mentors in trainee-mentor networking session (TMNS)	17
Trainees in TMNS	17
1:1 Trainee/Mentor meetings held during TMNS	34

### ***Photos from the Field***

Dr. Rachel Santymire works with US National Park Service veterinarian Dr. Danielle Buttke to collect samples from endangered black-footed ferrets at the Rocky Mountain Arsenal site just outside of Denver, Colorado.



Photo credit: Travis Livieri, Prairie Wildlife Research

### ***Guess whose poo?***

The mystery fecal was collected from a giant Pacific octopus (*Enteroctopus dofleini*).

The fecal photo taken in a zoo, shows the long “white ribbon-like” fecal collected in a 50mL falcon tube.

*Did you know?*

The siphon is a funnel-like hole on the side of the octopus' mantle that is used both for respiration and to excrete waste.

