

Veterinary medicine Immunoassays

Animal welfare measurement

Ethology – the study of animal behaviour – is becoming more and more important to the development of our understanding of animals. Whatever the research context – farming, wildlife management, pets or lab animals, animal welfare has become a mandatory priority. The measurement of markers

like cortisol, alpha amylase and melatonin in saliva provides a direct indicator of stress reactions as well as a useful tool for research into natural behaviour and into social disorders within a herd. It also can be used for studies on depression or anxiety.

Assays available from IBL International

Reproductive and stress hormones

- Cortisol, Corticosterone,
- alpha-Amylase,
- Testosterone, DHEA,
- Progesterone, Estradiol,
- Other steroid hormones

Immunology products

- Cytokines,
- Neopterin,
- HMGB1, ...

Neurotransmitters

- Melatonin,
- Adrenalin, Noradrenalin, Dopamine
- Serotonin, Histamine, ...

Products for research into Alzheimer's

- Amyloid beta,
- Amyloid beta fragments, APP, ...



Biological samples

Saliva
Faeces, Urine
Blood
Milk
Hair
Tissue homogenate



Species

Domestic and non-domestic animals:
Rat, Mouse, Pig, Primates,
Cow, Horse, Cat, Dog
Fish, Elephant, ...



IBL International GmbH

Flughafenstrasse 52 a
D-22335 Hamburg
Germany

Phone: +49 (0) 40 - 53 28 91 - 0
Fax: +49 (0) 40 - 53 28 91 - 11



IBL@IBL-International.com
www.IBL-International.com




List of Presentations

Talks

Reproduction (TR 1-7)

1. Janine Brown Hormone monitoring of wildlife species: An important tool for studying reproduction and aiding breeding management (keynote lecture)
2. Michael Heistermann Non-invasive assessment of physiological status: a  ear contribution to primatology (keynote lecture)
3. Catherine Wheaton Tolerance may lead to loss of tenure in tamarin societies: Use of non-invasive faecal reproductive steroid monitoring and behaviour observations to reveal reproductive and life-history traits in wild female cotton-top tamarins (*Saguinus oedipus*) in Colombia
4. Tamara Keeley The evaluation of reproductive hormones to determine the efficacy of commercial  GnRF vaccines as effective contraceptive options in captive female Asian Elephants
5. Tatiana Micheletti The use of altrenogest to reduce ovarian activity and avoid hyperoestrogenism after eCG-hCG ovulation protocol in tigrida (*Leopardus tigrinus*)
6. Ekaterina Pavlova Seasonal hormonal adaptations in felid reproduction
7. Jocelyn Bryant Faecal hormone metabolite monitoring of reproductive patterns and seasonality in red river hogs (*Potamochoerus porcus*)

Methodological issues (TMe 1-8)

1. Erich Möstl Remnants of stress hormones: Measurement and biological activity (keynote lecture)
2. Tobias Deschner LC-MS analyses of steroid hormones or their metabolites from faeces and urine: Problems and perspectives (keynote lecture)
3. Michael Lepschy Steroid extraction: Get the best out of faecal samples
4. Katie Edwards A practical field extraction method for non-invasive monitoring of hormonal activity in the black rhinoceros, *Diceros bicornis*
5. Otto Kallioikoski The confounding effect of GI activity on reliability of faecal glucocorticoids as biomarkers of stress
6. Sophie Rettenbacher Is stress of the female bird reflected in her eggs? 
7. Juliane Riechert Multiple sampling of common terns via blood-sucking bugs: change of prolactin and corticosterone values during incubation
8. Andy Kouba A novel method for non-invasively determining identity, gender, and reproductive status in vertebrates using Faecal Near Infrared Reflectance Spectroscopy (FNIRS): Case study results from okapi and giant panda

Stress (TS 1-8)

1. Nadja Wielebnowski The role of faecal glucocorticoid metabolite monitoring for welfare assessments and conservation management of wildlife (keynote lecture)
2. Chadi Touma Non-invasive monitoring of stress hormones in rodents and its application in biomedical research (keynote lecture)
3. Martin Amrein The effect of a fission-fusion zoo housing system on hormonal indicators of stress in Bornean orangutans (*Pongo pygmaeus*)
4. Marina Munerato Hormonal response to capture stress in free-ranging pampas deer (*Ozotoceros bezoarticus*)
5. Lara Metrione Living with the threat of predation: Faecal corticosterone metabolites in bison
6. Carole Fureix Do stereotypic horses cope better with poor environmental conditions? A physiological approach
7. Jim Clapp Quantifying fearfulness and aggression in beef cattle using saliva hormone measurements
8. Lisa Maria Glenk Can dogs relax? Work-related cortisol levels vary in dogs during animal-assisted interventions: A pilot study

New avenues (TNa 1-6)

1. Martin Dehnhard Non-invasive pregnancy diagnosis in felids based on faecal prostaglandin F2a metabolites (keynote lecture)
2. Tim Ellis Non-invasive monitoring of hormones in fish (keynote lecture)
3. Luana Cortinovic Preliminary study on non-invasive methods for hormonal profile determination in the basking shark (*Cetorhinus maximus*)
4. David Kersey Validating thyroxine and triiodothyroxine assays for use in measuring thyroid hormone metabolites excreted in the faeces and urine of the female giant panda
5. Cedric Girard-Buttoz Practicalities of urinary c-peptide measurements for monitoring the nutritional status of wild animals
6. Liza Moscovice Peripheral oxytocin levels in wild female chacma baboons fluctuate with oestrous state and involvement in sexual consortships

Miscellaneous topics (TMi 1-10)

1. Katharina Hirschenhauser Excreted steroid metabolites in bird droppings: behavioural studies using baseline patterns and stimulus-specific responses (keynote lecture)
2. Mareike Stöwe Social context: a modulator of behaviour and glucocorticoid secretion
3. Sascha Rösner Wildlife management of a highly endangered species: the capercaillie (*Tetrao urogallus*) – implications from behavioural and physiological indicators
4. Rachel Santymire Difficulties of determining pregnancy non-invasively in the endangered black-footed ferret
5. Antje Engelhardt Female signals of fertility and male reproductive behaviour in macaques
6. Bernard Wallner Macaque mothers' pre-conception faecal testosterone levels relate to dominance and to sex of offspring
7. Andre Ganswindt Endocrine drivers of flexible rutting behaviour in male giraffes (*Giraffa camelopardalis*)
8. Jennifer Sanderson Carers and non-carers respond differently to a territorial challenge; evidence for a physiological division of labour in the banded mongoose (*Mungos mungo*)
9. Verena Behringer Adrenarche in bonobos (*Pan paniscus*): Evidence from ontogenetic changes in urinary dehydroepiandrosterone-sulfate (DHEA-S) levels
10. Mathias Nemeth Saliva cortisol in relation to cognition and behaviour after PUFA administration in guinea pigs

Posters**Reproduction (PR 1-23)**

1. Annemieke van der Groot Faecal progestagen patterns in wild African white rhinoceros (*Ceratotherium simum*)
2. Franz Schwarzenberger Reproductive steroid monitoring in white rhinoceroses kept in European zoos
3. Katie Edwards Using hormone analysis to investigate reproductive success in the female eastern black rhinoceros (*Diceros bicornis michaeli*)
4. Jess Trotter Relationship between management, adrenal activity and reproduction in a captive group of female Asian elephants (*Elephas maximus*)
5. Ulrike Pfeiffenberger Faecal steroid monitoring as a supportive tool for the reproductive management of okapis kept in European zoos
6. Susan Walker Reproductive cyclicity in female okapi (*Okapia johnstoni*): the potential role of mate compatibility?
7. Katherine Cho Pregnancy diagnosis in wild equids, the Przewalski's horse (*Equus caballus przewalskii*) and onager (*Equus hemionus onager*)
8. Evalina Zanetti Comparison of two different superovulation protocols on ovarian and adrenal activity in the brown brocket deer (*Mazama gouazoubira*)
9. Priscila Viau Analytic profile of oestrogens and progestins in different biological matrixes in the ovine (*Ovis aries*)
10. Katherine MacKinnon Assessment of the reproductive physiology of the potto (*Perodicticus potto*)
11. Barbara Tiddi Influence of the ovarian cycle stage on female proceptive behaviours and male mating activity in wild tufted capuchin monkeys
12. Marcelo Guimarães Non-invasive monitoring of reproductive endocrine profile and socio-sexual behaviour in captive black-tufted marmoset (*Callithrix penicillata*)

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| 13. Monique Paris | Reproductive physiology of the world's rarest canid: patterns in oestradiol, progesterone, glucocorticoid and testosterone metabolites in Ethiopian wolves (<i>Canis simensis</i>) |
| 14. Itsuki Adachi | Pregnancy detection and endocrinological regulation of parturition in Tsushima leopard cat (<i>Prionailurus bengalensis euptilurus</i>) |
| 15. Johanna Painer | Reproductive hormones in serum samples from free ranging Eurasian lynx (<i>Lynx lynx</i>) and their value for reproductive assessment |
| 16. Letitia Zezza | Non-invasive monitoring of sexual profile in two pubertal captive polar bears (<i>Ursus maritimus</i>) |
| 17. Karen Steinman | Validation of enzyme immunoassays for the measurement of reproductive hormones in polar bear (<i>Ursus maritimus</i>) urine |
| 18. Mandi Vick | Non-invasive monitoring of reproductive hormones in faecal samples from sloth (<i>Melursus ursinus</i>) and Andean (<i>Tremarctos ornatus</i>) bears, preliminary findings |
| 19. Marie-Odile Chelini | Adrenal glands release oestrogens in response to an ACTH challenge: A possible mechanism for stress induced reproductive dysfunction |
| 20. Marina Ponzio | Evaluation of three immunoassay systems for the assessment of urinary biomarkers of ovarian function in the endangered chinchilla (<i>Chinchilla lanigera</i>) |
| 21. Eva Millesi | Ovarian activity in captive and free-ranging European ground squirrels during the breeding and post-breeding period |
| 22. Annalisa Zaccaroni | Non-invasive methods for the hormonal profile determination in eels |
| 23. Constanza Formigaro | Comparison of hormonal screening results in placenta tissue and blood of orca (<i>Orcinus orca</i>) |

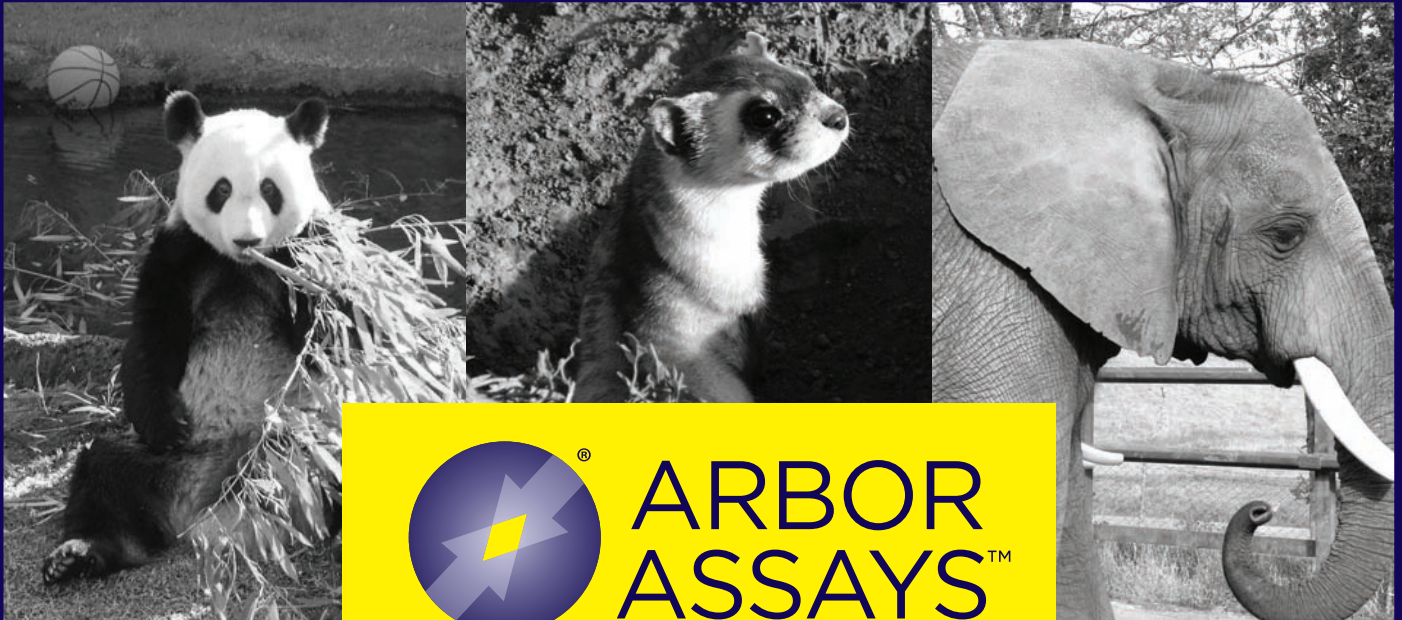
Stress (PS 1-35)

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| 1. Diana Armstrong | Ape behaviour and hormonal response to alternation between zoo enclosures at Lincoln Park Zoo |
| 2. Christof Neumann | Stress levels, dominance rank and hierarchy dynamics in wild male crested macaques (<i>Macaca nigra</i>) |
| 3. Assahad Gholib | Number of fertile females and male social status influence physiological stress levels in wild male crested macaques (<i>Macaca nigra</i>) |
| 4. Carlo Cinque | Relocation stress induced long-term faecal hormonal modifications in semi free-ranging social groups of <i>Macaca tonkeana</i> |
| 5. Brandon Wheeler | Feeding competition and stress in wild tufted capuchin monkeys: Implications for the evolution of "deceptive" alarm calling |
| 6. Leticia Martinez | Comparison of faecal cortisol metabolite concentrations in white rhinoceroses (<i>Ceratotherium simum</i>) living in three different environments |
| 7. Sara Cáceres | Faecal cortisol and progesterone metabolites concentration in four captive white rhinoceros (<i>Ceratotherium simum</i>) kept in different housing conditions |
| 8. Julia Eggermann | Human activity is not the main source of stress in wolves |
| 9. Leanne van der Weyde | Adrenal activity in captive and free-ranging African wild dogs (<i>Lycaon pictus</i>) during the breeding season |
| 10. Bart Vlamings | Dog appeasing pheromone®: A useful tool to minimize stress and aggression in African wild dogs (<i>Lycaon pictus</i>)? |
| 11. Nadja Kneidinger | The use of non-invasive monitoring methods in conservation breeding of the endangered European mink (<i>Mustela lutreola</i>) |
| 12. Kerry Fanson | Individual stress response predicts post-release survival in reintroduced Canada lynx |
| 13. Maik Rehnus | Influence of tourism activities on glucocorticoid secretion in mountain hares (<i>Lepus timidus</i>) |
| 14. Elizabeth Freeman | Evaluation of faecal glucocorticoid metabolites in captive red pandas (<i>Ailurus fulgens</i>) |
| 15. Robyn Pimm | Response of female veiled chameleons (<i>Chameleo calypttratus</i>) in a research colony to environmental disturbances |
| 16. Juan Busso | Assessment of food-based enrichment in collared anteater (<i>Tamandua tetradactyla</i>) by non-invasive monitoring of adrenocortical activity |
| 17. Michaela Brenner | Anthropogenic effects on European ground squirrels physiology |
| 18. Carina Siutz | B ⁺ fat content and faecal cortisol secretion patterns in free-ranging juvenile Common hamsters |

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| 19. Katie Graham | Preliminary investigation of the use of non-invasive measurements of faecal immuno-reactive corticosterone in rufous fantails (<i>Rhipidura rufifrons</i>): A potential diagnostic tool for choice of best candidates for translocation |
| 20. Alvaro Navarro-Castilla | Motorways as stressors for wild wood mouse (<i>Apodemus sylvaticus</i>) populations |
| 21. Vera Voznessenskaya | Perception of sex pheromones in closely related mus species is modulated by glucocorticoids |
| 22. Joao Ferreira | Non-invasive measurement of adrenocortical activity in Blue-fronted parrot (<i>Amazona aestiva</i>) |
| 23. Nicoletta Formenti | Evaluation of the physiological stress response induced by winter sports in a black grouse (<i>Tetrao tetrix</i>) population from Lepontine Alps (VB) |
| 24. Sonja Ludwig | Effects of mate separation on stress hormones, parasite load and immune parameters in free-living greylag geese |
| 25. Michaela Spreafico | Physiological and behavioural response in Carrion crows (<i>Corvus corone corone</i>) after relocation to a new environment |
| 26. Georgine Szipl | Vocal response to stressful situations in Carrion crows (<i>Corvus corone corone</i>) |
| 27. Matthias Loretto | Does coping style affect preferences for feeding sites in ravens? |
| 28. Witold Kędzierski | Plasma and salivary cortisol levels as the indicators of stress and fatigue during field exercise test in Thoroughbred horses |
| 29. Line Ahrendt | Relationship between social rank and adrenocortical activity in horses |
| 30. Dean Konjević | Non-invasive monitoring of adrenocortical activity in captive fallow deer (<i>Dama dama L</i>) |
| 31. Eva Van laer | Effect of mild heat stress on faecal cortisol metabolites, blood minerals and energy metabolism of Holstein cows |
| 32. Holly Boland | Determination of stress in beef calves weaned using different methods |
| 33. Leire Ruiz | Non-invasive measures of acute stress reactivity in European rabbit (<i>Oryctolagus cuniculus L.</i>) restocking fences and their relation to fitness |
| 34. Ramón Rivera | Using non-invasive methods to determine animal stress in surgical training models |

Methodological issues, New avenues & Miscellaneous topics (PM 1-10)

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| 1. Agnes Haymerle | Faecal cortisol metabolites to assess stress in wildlife: Evaluation of a field method on free ranging chamois |
| 2. Rebecca Rimbach | Validation of a faecal glucocorticoid assay and effects of daytime, sex and female reproductive state on glucocorticoid output in spider monkeys (<i>Ateles hybridus</i>) |
| 3. Mohammad Agil | Biological validation of enzyme immunoassays for measurement of faecal androgen and glucocorticoid metabolites in crested macaques (<i>Macaca nigra</i>) |
| 4. Stefanie Petow | A new quantification method for the analysis of non-metabolised faecal cortisol with a commercial ELISA Kit |
| 5. Meredith Bashaw | Assay development for pregnancy testing of sitatunga (<i>Tragelaphus spekei</i>) |
| 6. Esther Carlitz | Monitoring stress in captive and wild orangutans with cortisol measurements obtained from shed nest hair? |
| 7. Linda Hofman | Levels of cortisol in hair samples of non-human primates |
| 8. Russ Hart | A preliminary investigation for monitoring reproductive status using prostaglandin F ₂ -alpha metabolite (PGFM) and proposed pregnancy biomarker ceruloplasmin in the urine of giant pandas |
| 9. Irene de la Casa | Endocrine disruption associated to oral administration of atrazine in European quail (<i>Coturnix coturnix coturnix</i>) |
| 10. Myrna Campos Ferraz | Effect of brute propolis on the diet of <i>Callithrix jacchus</i> used in research: Maintenance of the body weight |



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NON-INVASIVE ENDOCRINOLOGY KITS:

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- » Estrone
- » Estrone-3-Glucuronide (E1G)
- » Estrone-3-Sulfate (E1S)
- » Pregnanediol-3-Glucuronide (PDG)
- » Progesterone
- » Testosterone

NON-INVASIVE PREGNANCY KITS:

- » Ceruloplasmin Activity Assay
- » PGFM EIA

ASSAY COMPONENTS:

- » Coated Plates
- » Goat Anti-Mouse IgG, Fc, Affinity purified
- » Goat Anti-Rabbit IgG, Fc, Affinity purified
- » Donkey Anti-Sheep IgG, Affinity purified
- » Coating Buffer
- » Blocking Buffer

