

# Honours Research Projects

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Current Honours research projects available in the  
School of Veterinary Science

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## Measuring intragastric pH wirelessly in horses

Treatment for gastric ulcers in horses is based on inhibiting gastric acid secretion, with the target of increasing gastric pH > 4. Monitoring gastric acidity is highly important when evaluating the efficacy of acid suppressors, however, current options are complex with a variety of limitations, and do not permit continuous pH measurement in field settings. Several studies have measured intragastric pH using a calibration-free reflux capsule in humans and monkeys. This capsule is designed to be temporarily attached to the distal oesophageal mucosa in humans, fixed by mucosal suction for 48 hours. A novel placement method has been reported using a haemostasis clip to attach it to the gastric mucosa. This project will evaluate the feasibility of a novel placement method of the calibration-free reflux capsule for measuring intragastric pH in horses. This project involves both practical equine work (implantation of capsules and monitoring gastric pH) as well as data analysis. Expected outcomes of this project for the student include a first-author publication in a peer-reviewed journal, the opportunity to present findings at a national conference (e.g., Bain Fallon), and support to develop strong links with the equine and pharmaceutical industries. This project has been designed to prepare a student to be competitive in internship applications, or enable a motivated student to upgrade to a HDR upon completion.

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## Tick paralysis in the endangered Spectacled flying fox in Far North Queensland

The Spectacled flying fox (*Pteropus conspicillatus*) is a frugivorous megabat, colloquially known as flying foxes in Australia, with a restricted habitat range in Far North Queensland. The species has been listed as endangered and thus any mortality events in the population need to be investigated. Tick paralysis caused by the paralysis tick (*Ixodes holocyclus*) causes the death of hundreds of adult spectacled flying foxes each year in Spring and Summer. Often this results in mass orphanings and neonatal death of pups as the “tick season” coincides with the Spectacled flying fox birthing season. Spectacled flying foxes are the only Australian mainland flying fox known to succumb to tick paralysis.

Dr McMichael works closely with the Tolga Bat Hospital on the Atherton Tablelands which is the primary rehabilitation centre for Spectacled flying foxes in Far North Queensland. The tireless work of staff and volunteers at the hospital during tick paralysis season in collaboration with SVS researchers has led to the development of a research project investigating the epidemiology of tick paralysis in the Spectacled flying fox.

We would like to invite an honours student to participate in this exciting research. The investigation will have strong molecular biology aspects in examining the tick haplotypes found on individual flying foxes in combination with efficacy of treatment. The project also has feasibility to be broadened to examine tick borne pathogens and tick toxin variability dependent of project progression, and may indeed lead to an exciting PhD proposal. The research will be based at the School of Veterinary Science on Gatton campus utilising both archived and prospective tick and animal samples from the Tolga Bat Hospital and will include an opportunity for field work at the hospital in Atherton. Rabies vaccination will be required.

Please contact Dr Lee McMichael ([l.mcmichael@uq.edu.au](mailto:l.mcmichael@uq.edu.au)) for further information.

## Examination of the reasons for students to select veterinary science as a career path with a focus on gender.

Since the 1980s there have been steady increases in females entering the veterinary profession. In Western nations, there is now a sustained and pronounced feminisation of the veterinary sciences. This project will look at how the Australian context compares to international programs, and also the reasons why Australian students choose to enrol in veterinary science degrees. As well as how veterinary science compares to other professions. Skills include literature review, scientific writing, data analysis and surveys.

Supervisors: Prof. Rachel Allavena & Dr Fran Shapter

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## Egg yolk and semen freezing; identifying key cryoprotective components

Cryopreservation of spermatozoa induces significant cellular damage, which is only limited using cryoprotective agents. Egg yolk has been used as a cryoprotectant in semen freezing media for almost a century, and while yolk low density lipoproteins have been identified as an important protective element, our understanding of the exact cryoprotective mechanisms remains incomplete. Pinpointing the cryoprotective components of egg yolk is an important step towards minimising freezing damage and improving the outcomes of artificial insemination using frozen semen across a range of species, including livestock, wildlife and humans. This project will involve isolation and application of different egg yolk components to discern which is best able to protect sperm during cryopreservation. This project involves both practical animal work (semen collection) and laboratory-based work (semen freezing and advanced semen analyses).

**Contact:** Dr Taylor Pini, [t.pini@uq.edu.au](mailto:t.pini@uq.edu.au)

## Sperm proteasome function during chilled and frozen storage

The ability to store semen as a chilled or frozen product is important both for agricultural industries and conservation efforts. While cryopreservation offers unlimited storage of sperm, it causes significant sub-lethal damage; in comparison, although chilled storage results in less damage, shelf life is limited to 24-48 hours. To both minimise freezing damage and prolong chilled storage, it is important to understand what causes sperm to deteriorate following chilling and freezing. A potential explanation for this decline is breakdown of the cellular protein recycling machinery, the proteasome. This project will involve analysing markers of proteasome function in fresh, chilled and frozen sperm to discern how the proteasome is impacted by storage. This project involves both practical animal work (semen collection) and laboratory-based work (semen freezing and advanced semen analyses).

**Contact:** Dr Taylor Pini, [t.pini@uq.edu.au](mailto:t.pini@uq.edu.au)

## Current understanding and attitudes towards compassion fatigue and other mental health illnesses in SE Qld Veterinary Clinics.

Charles Figley (1995) described compassion fatigue as equivalent to secondary traumatic stress, and defined compassion fatigue as the caregiver's reduced capacity or interest in being empathic or "bearing the suffering of clients;" and being "the natural consequent behaviours and emotions resulting from knowing about a traumatising event experienced or suffered by a person". There is a substantial body of evidence of occupational stress in personnel working in human health care and, to a lesser extent, in animal health care. Professionals who work with people or animals, particularly those who are suffering, must not only cope with the normal stress or dissatisfaction of work but also with their personal feelings and emotional response to that suffering.

Compassion fatigue in animal-related professions is most often considered to be a direct result of the impact of euthanasia. However, evidence to date suggests that negative feelings are also induced by other common occupational stressors such as client financial constraints, employee workload, long-term care of patients with chronic diseases and, end of life care (Stamm, 1995; Figley, 1995; Figley & Roop, 2006; Rollin, 1987; Black et al., 2011; Foster & Maples, 2011; Baran et al., 2012). Compassion fatigue and the associated negative feelings can also be compounded by feelings of failing a patient, the client, or both (Joinson, 1992; Stamm, 1995; Figley, 1995; White & Shawhan, 1996; Arluke, 1991; Black et al., 2011; Foster & Maples, 2011; Baran et al., 2012). There is increasing dialogue on occupational stigma and the negative perception of various animal-related work tasks including broadly, the decision to euthanize, the use of animals in research and the global push towards the ideals of no-kill animal shelters (Rohlf & Bennett, 2005; Black et al., 2011; Foster & Maples, 2011; Baran et al., 2012; Davies & Lewis, 2010; Anderson et al., 2013). This stigma may further compound the effects of occupational stress and compassion fatigue and lead to emotional dissonance and the potential for emotional contagion not only between those directly involved in these tasks but also to ancillary and support staff such as receptionists and other office workers (Rohlf & Bennett, 2005; Black et al., 2011; Foster & Maples, 2011; Baran et al., 2012; Davies & Lewis, 2010; Anderson et al., 2013).

Further to this, a study by Jones-Fairnie et al. (2008) looked at the rate of suicide among veterinarians in two Australian States and reported that many older Australian veterinarians claim to know of at least one colleague who has committed suicide. The rate of suicide in paraprofessionals is also thought to be on the increase, however no research has been conducted to this end. These increases in suicide leads to the perception that veterinary professionals may be at considerable risk for suicide. Presently, however, there is no evidence that rates of suicide for Australian veterinarians differ markedly from that of the general population.

This study aims to gather information relating to veterinary personnel current understanding and attitudes towards compassion fatigue and other mental health illnesses in SE Qld Veterinary Clinics.

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## Determining the feasibility of including 'mental health risk assessments' in animal ethics applications, research protocols and, teaching protocols that incorporate high risk tasks.

OH&S is a strong focus across all industries and occupations. Risk assessments are very important as they form an integral part of an occupational health and safety management plan. They help to create awareness of hazards and risk, identify who may be at risk (e.g., employees, cleaners, visitors, contractors, the public, etc.), determine whether a control program is required for a particular hazard, prevent injuries or illnesses, especially when done at the design or planning stage, prioritize hazards and control measures and, meet legal requirements where applicable.

Risk assessments comprise a major component in animal ethics applications, research protocols and teaching protocols. These specific situations or applications focus entirely on the physical risk of procedures, chemicals and interactions.

There is ever emerging literature (Scotney et.al., 2017) on the mental and emotional effects of those working in animal-related occupations and as such it is important to consider potential risk factors associated with 'high-risk' tasks in this area. By formally identifying high-risk tasks, it is then possible to put in place strategies and resources to aid in mitigating the effects of same.

The aim of this project is to determine the feasibility of including mental health risk assessments in animal ethics applications, animal research protocols and teaching protocols.

**Contact:** Dr Rebekah Scotney [rebekah.scotney@uq.edu.au](mailto:rebekah.scotney@uq.edu.au)

## The social and psychosocial construct of abattoir workers and the psychological effects of perceived dirty work.

There are limited studies which look at the mental well-being of those who work in abattoirs. Extant work regarding meatworkers has tended to focus on either the psychological well-being of workers (e.g., Dillard, 2008) or the potential health hazards for consumers, given food chain concerns (e.g., Nowak, Sammet, Klein, & Mueffling, 2006). Where attention has turned more toward the broader aspects of attitudes to animals within meat-working populations, the issues raised have been disturbing on both human and animal welfare fronts. In 2008, Dillard called for legal redress for "slaughterhouse workers" (commonly termed "meatworkers" in Australia/NZ) because of the psychological trauma caused by their daily experience of "large-scale violence and death" (p. 391) within an institutional culture that does little to reduce animal or human suffering (Richards et.al., 2013).

There are gaps in knowledge of the underpinning social and psychosocial construct of those who work in abattoirs. A better understanding of the prevalence of lowered mental wellbeing and psychological harm among abattoir workers needs to be achieved so as to bridge this gap and, to inform strategies and programs to aid mental wellbeing in those employed in abattoirs.

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## Impact on carers of cat colonies that are subjected to differing methods of cat management– either carer-centred or enforcement centred management.

Approximately 3-9% of Australian adults care for cats they do not perceive they own. Some people care for six or more cats, which is then considered a cat colony. Most of these cats are unsterilized and free-roaming, which results in complaints to authorities about nuisance behaviours such as soiling and fighting, wildlife predation, and animal welfare concerns.

The dominant approach taken by local governments, known as enforcement-centred management, includes trapping stray cats and killing those that cannot be adopted. This method of cat management is reflected in the average euthanasia rate for cats in shelters and municipal pounds of 38% across Australia, with some pounds killing up to 98% of cats. This inhumane approach is in contrast to carer-centred management that focuses on sterilization of all cats, which has been shown to result in rapid improvement in cat welfare and a sustained decrease in cat numbers.

An enforcement-centred approach to stray cat management is distressing for cat carers. Those carers who experience forced removal and euthanasia of their cats report symptoms consistent with post-traumatic stress. However, the impact on quality of life, including mental health of cat colony carers, has been poorly characterized.

This study aims to use a quantitative methodology to determine and compare the effects on carers of cat colonies of carer-centred and enforcement-centred management methods. We hope that the results of this research will help to change stray cat management in Australia to a proactive and carer-centred approach based on assisting with sterilization of colony cats.

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## Compassion fatigue and quality of life in people working in cat rescue

Volunteers with cat rescue groups have high empathy and are dedicating their spare time, labour and funds for the love of animals. They are dealing with an ever increasing number of requests to help cats and kittens that need a home. As the number of stray cats has increased over the years, so has the demand to help sick and injured cats and kittens. Due to the number of calls from the public about cats desperately needing assistance, rescue group members experience secondary trauma. They are also vulnerable to primary trauma in the form of mental, emotional and sometimes physical abuse from working in difficult and some dangerous environments.

While there has been research on compassion fatigue for professionals (paid workers with certified training etc), there does not appear to be research investigating the impact on rescue group members who are constantly overwhelmed by the number of cats and kittens needing help. The cat rescue groups do not have the resources, expertise or funds to proactively address compassion fatigue as do local governments or large animal welfare agencies. Cat rescue groups find it challenging to have sick leave, backup staff/volunteers, time for training etc and consequently experience burnout and high turnover of volunteers.

There is a need to investigate the mental wellbeing and levels of compassion fatigue in cat rescue volunteers.

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### Pilot study determining the efficacy of two commercial formulations of pergolide to treat Pituitary pars intermedia dysfunction (PPID) in horses.

PPID is a common disease afflicting horses (and ponies) throughout the world, with more than 20% of horses older than 15 years affected. Clinical signs of PPID include hypertrichosis, chronic infections; hyper- or anhidrosis and recurrent laminitis. Laminitis is a painful and incurable condition of horses resulting in loss of use, high veterinary and farrier expenses and decreased survival.

Elevated basal plasma adrenocorticotrophic hormone (ACTH) concentration is used to diagnose PPID. The dopamine agonist pergolide mesylate provides the most effective treatment for PPID. Dosages used to successfully control PPID range from 1 to 5 mg of pergolide daily. Treatment success is considered to be resolution of clinical signs and normalization of ACTH concentrations. There are anecdotal reports of high rates of treatment failures in horses and ponies being treated with liquid pergolide products. This may be because of inadequate dose or degraded drug because of inappropriate storage conditions and delays between manufacture and administration.

The proposed pilot study would enrol client owned horses and ponies with PPID. ACTH concentration will be periodically measured after treatment with a liquid and tablet formulations of pergolide. A dose escalation study will be performed until clinical signs and ACTH concentrations improve. The efficacy of liquid and tablet formulations of pergolide will be compared.

*This project will only be available if funding is obtained.*

Contact: Allison Stewart [allison.stewart@uq.edu.au](mailto:allison.stewart@uq.edu.au) phone 0417962127

### Comparison of the effects of storage and temperature on the stability of Australian liquid formulations of pergolide

PPID is a common disease afflicting horses (and ponies) throughout the world, with more than 20% of horses older than 15 years affected. Clinical signs of PPID include hypertrichosis, chronic infections; hyper- or anhidrosis and recurrent laminitis. Laminitis is a painful and incurable condition of horses resulting in loss of use, high veterinary and farrier expenses and decreased survival.

The dopamine agonist pergolide mesylate provides the most effective treatment for PPID. Dosages used to successfully control PPID range from 1 to 5 mg of pergolide daily. Treatment success is considered to be resolution of clinical signs and normalization of ACTH concentrations. There are anecdotal reports of high rates of treatment failures in horses and ponies being treated with liquid pergolide products. This may be because of inadequate dose or degraded drug because of inappropriate storage conditions and delays between manufacture and administration.

Concentrations of pergolide in various commercially available products will be measured after exposure to various temperatures and periods of time using liquid chromatography-mass spectrometry (LC-MS).

*This project will only be available if funding is obtained.*

**Contact:** Allison Stewart [allison.stewart@uq.edu.au](mailto:allison.stewart@uq.edu.au) phone 0417962127

## Assessing gender equality in the veterinary science academic realm

Gender bias in academia, favouring men over women, penetrates virtually all domains of academic, including positions, promotions to higher positions, success in obtaining grants and many others. More effort needs to be made globally to improve the representation of women in higher education to reflect the diversity of our society

The study aims to evaluate the proportion of female academic staff in veterinary science schools/faculties worldwide and investigate factors determining gender inequality at different levels of career progression. This will provide information that may help to understand why the biggest challenges for workplace gender equality in this discipline. This may also raise awareness of gender bias and unconscious discrimination, that may enable a fair evaluation, selection and support of outstanding individuals.

The student will gain skills in data mining, data cleaning, data interpretation and statistical analysis. The project can be completed under a remote working arrangement.

**Contact:** A/Prof Chiara Palmieri ([c.palmieri@uq.edu.au](mailto:c.palmieri@uq.edu.au)), A/Prof Rachel Allavena & A/Prof Bec Dunlop

## The 'dolphin chirp' – a potential new dolphin vocal sound

The 'dolphin chirp' is a short, relatively low-frequency downsweep sound, which has been recorded (using a fixed hydrophone array) quite often off the coast of Peregrine Beach on the Sunshine Coast. Groups of bottlenose dolphins are commonly seen around the hydrophone array therefore it is likely that this sound comes from bottlenose dolphins. However, this 'chirp' sound is quite unique, in that there are no similar sounds that have been attributed to bottlenose, or indeed any species, of dolphin in the literature. Preliminary work has acoustically positioned these chirp sounds to other dolphin sounds (click and whistle sounds) on a few occasions. These chirp sounds also seem to have little variation in structure, and may be significantly louder than other dolphin sounds, therefore may be a useful sound for acoustically monitoring this dolphin population. This project will carry out further analysis on the 'chirp' sounds to provide further evidence that this is a novel sound from bottlenose dolphins. It will estimate the variance in sound structure within and between chirp bouts, compare sound parameters with other commonly heard tonal dolphin sounds (whistles) and determine if there are any changes in the frequency of 'chirp' acoustic detections over time (2002 – 2015). Results of this study will likely add a novel sound to the bottlenose dolphin repertoire, and provide some evaluation of its potential to be used in acoustic monitoring of this population of dolphins.

**Contact:** Dr Rebecca Dunlop [r.dunlop@uq.edu.au](mailto:r.dunlop@uq.edu.au) and Associate Professor Michael Noad [m.noad@uq.edu.au](mailto:m.noad@uq.edu.au)

## The use of surface-generated sounds in the presence of singers

Humpback whales emit two main communication sounds; vocal sounds and sounds generated on the surface (by breaching and slapping their pectoral and tail fins). Groups of whales tend to switch their communication strategy from using primarily vocal sounds, to using primarily surface-generated sounds, in higher wind noise. Whales also emit vocal sounds at higher levels in increased wind noise and therefore utilise two different methods to overcome potential deleterious effects communicating in noise. Interestingly, whales must also consider their social environment when signalling. Groups (especially females with a nursing calf) emit vocal sounds at lower levels in the presence of singing whales, despite the song being a potential source of noise. This is presumably to avoid the unwanted attention of a singing male. Therefore there are two competing effects; wind noise causing an increase in vocal level, and singing whales causing a decrease in vocal level. It is unknown, however, if whales emit fewer surface-generated sounds in the presence of singing whale (potentially to avoid the unwanted attention of the male), and if noise levels change this response. This project will determine if singing whales have an effect on the use of surface-generated sounds in humpback whale groups. It will also consider the potential effect of noise within this response to their social environment.

**Contact:** Dr Rebecca Dunlop [r.dunlop@uq.edu.au](mailto:r.dunlop@uq.edu.au)

## Compare total and ionised calcium levels in wild reptiles with those in captive reptiles

**Hypothesis:** That wild reptiles will have significantly higher total and ionised calcium levels than those kept in captivity

**Reason:** Metabolic bone disease, particularly nutritional secondary hyperparathyroidism, is common in captive reptiles. Artificial lighting is used in an attempt to prevent this problem, but it is not always effective. This project will demonstrate to veterinarians and pet owners the difference between wild and captive reptile calcium levels.

**Method:** Blood will be collected from wild and captive Carpet pythons and Bearded dragons and analysed for total and ionised calcium levels. The results will be analysed to see if there are significant differences.

**Contact:** Dr Bob Doneley [r.doneley@uq.edu.au](mailto:r.doneley@uq.edu.au)

## Evaluation of overall prevalence and phylogeography of methicillin resistant *Staphylococcus* spp. carriage in dogs and cats presented in two veterinary referral centres in the greater Brisbane

Methicillin-resistant *Staphylococcus* species are a major area of study worldwide due to their zoonotic potential and ability to develop multi-resistance to antibiotics. Methicillin-resistant *Staphylococcus* (MRS) infections as well as carriage have been shown in both people and animals. MRS carriage prevalence for dogs in North America is well known but its prevalence in Australia has not yet to our knowledge been reported. Australia is usually well-known for its overall low prevalence in infectious diseases so it is possible that the carriage rate could be different. The main goal of this study is to evaluate the overall prevalence of Methicillin-resistant *Staphylococcus* spp through the sampling of dogs and cats in different setting and location around the greater Brisbane area. The second goal would be to evaluate possible difference in carriage rates depending on location (urban vs rural area) and level of association with veterinary medical environment (general practice vs referral practice). The third goal would be to compare the strains obtained in animals to the ones most present in humans. The clinical and public health implications of this project are numerous and could lead to the development of collaborative projects with physicians and infectious diseases researchers as part of the One Health project.

The expected benefits of this project for a student are as follow:

The student will gain significant experience in study design, scientific data collection and statistical treatment of that information.

The preliminary data will be presented by the student at the end of the study period to the supervising staff in a 15 min oral presentation. The final data could be also submitted for presentation at a local, national or international congress.

The data collected will lead to the writing of a scientific manuscript for publication in a peerreviewed journal. The student will be involved in the redaction of the manuscript for additional experience with writing of scientific article with the degree of involvement depending on the personal implication in the project of the student.

This project requires mainly an individual who is serious, highly motivated, hard-working and can be relied on for the collection of the study sample and data. An interest in microbiology, data analysis and statistics software will be appreciated but is not mandatory.

**Contact:** Dr Erika Meler [e.meler@uq.edu.au](mailto:e.meler@uq.edu.au)

## Reliability and accuracy of activity trackers in dogs

The use of activity trackers in humans is widespread and nowadays common use. These are mostly used to objectively record people activity and to ensure that an adequate calorie-burning activities are done in day. Some companies have developed similar devices for dogs. These devices have some similarities but also more varied purposes. The initial goal of these device in companion animals was the ability to locate them via GPS application when lost. Nowadays the new generations of pet trackers are advertised to allow also monitoring of heart rate, respiratory rate as well as activity level. Up to now, there is no evidence of a study looking at the reliability and accuracy of these devices offered to the technology eager public of pet owners. Some of the data generated by these trackers will without a doubt trigger questions to treating veterinarians. It appears important from a medical point of view to be able to provide a thoughtful insight based on sound research on the validity of the measurement obtained with these new devices. Moreover, should some of these devices be identified as particularly reliable and accurate from this study, follow-up research could investigate their use in the clinical setting for animals with cardiac, respiratory, orthopaedic or neurologic conditions.

**Contact:** Dr Erika Meler [e.meler@uq.edu.au](mailto:e.meler@uq.edu.au)

## Medical geography of Q-fever in Queensland

Q-fever is a notifiable zoonotic infection which causes debilitating disease in humans working with livestock and potentially the community. It is highly incident in Australia particularly in Queensland. The student will build a spatial model to identify the level of disease clustering in Queensland and the role of individual, household and environmental factors that determine its geographical distribution.

**Contact:** [Dr Ricardo Soares Magalhaes r.magalhaes@uq.edu.au](mailto:r.magalhaes@uq.edu.au) Phone: 5460 1827

## Oral microbiome of Bilbys; comparing wild and captive animals.

The project aims to:

Review the incidence of captive held Bilbys in Australian collections via retrospective analysis of zoo medical records

Describe the dental anatomy of Bilbys

Collect samples from both wild and captive Bilbys to allow the identification and comparison of oral bacteria by PCR and culture

The outcome of this project will be to identify a marker for the early recognition of dental disease in captive Bilbys.

**Contact:** Bob Doneley ([r.doneley@uq.edu.au](mailto:r.doneley@uq.edu.au))

## Assessing perceptions of tick and flea infestation risk in southeast Queensland

Paralysis ticks (*Ixodes holocyclus*) and cat fleas (*Ctenocephalides felis*) are two of Australia's most economically important ectoparasites. Both parasites cause morbidity in pets and can infest a diversity of wildlife species. This represents a substantial One Health issue, yet factors that influence risk of parasite infestation, and how people perceive this risk, are not known. This presents a challenge for animal health workers, as people's risk perception and knowledge of their pets' interactions with wildlife can influence parasite spread at the domestic animal – wildlife interface. This Honours project aims to understand factors that influence pet owners' perceptions of ectoparasite infestation risk. Voluntary questionnaires and requests for public parasite submissions will be used to identify factors influencing risk of paralysis tick and flea spillover between wildlife and pets in southeast Queensland. Data collected will be non-identifiable but will provide necessary information to (1) quantitatively assess environmental and demographic correlates with risk perception; and (2) contribute to spatial models of incidence risk. Interests in One Health, wildlife disease and spatial data analysis will be appreciated.

Working as part of a vibrant research team, students will benefit in the following ways:

- Community engagement from a One Health perspective
- Script-based quantitative data analysis and spatial modelling

Contributing to the planning, writing and submission of peer-reviewed publications This project is funded and has ethics approval.

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## Spatial modelling of wildlife hospital admissions

Wildlife hospitals offer a tremendous service to the local community. One of the key benefits they can provide is gathering information on spatial and temporal patterns in wildlife trauma incidents. Understanding which species are more susceptible to trauma, and uncovering particular areas or times of the year when incidents are more likely to occur, can provide powerful leverage to local planners, conservation groups and policymakers. This Honours project will apply spatial modelling tools to a large dataset of wildlife hospital clinical records to identify factors associated with increased incidence of trauma. Outputs will consist of high-resolution maps of trauma incidence estimates and reports aimed at influencing planning decisions in efforts to reduce these occurrences. Interests in wildlife Health, conservation and spatial data analysis will be appreciated

Working as part of a vibrant research team, students will benefit in the following ways:

- Script-based quantitative data analysis and spatial modelling
- Interacting with wildlife veterinarians to guide a joint research agenda
- Contributing to the planning, writing and submission of peer-reviewed publication

This project is funded and has ethics approval.

**Contact:** Dr Nicholas Clark; [n.clark@uq.edu.au](mailto:n.clark@uq.edu.au) and A/Prof Ricardo Soares Magalhães; [r.magalhaes@uq.edu.au](mailto:r.magalhaes@uq.edu.au)

## Determining the presence and persistence of colostral transfer of passive immunity against Hendra virus in foals, and their response to Hendra vaccination.

Hendra virus (HeV) is a uniquely Australian zoonotic virus of horses, posing significant economic, animal welfare, and public health concerns. The virus is transmitted from bats to horses.

An equine vaccine Equivac® HeV is available and antibody titres greater than 1:32 are considered protective. There have been no HeV cases in vaccinated horses. As there is no human vaccine for HeV, the most effective means of preventing human infection is through vaccination of horses. All horses at UQ are vaccinated, with foals vaccinated at 4-6 months of age.

Immunity in the equine neonate is conferred via transfer of passive immunoglobulins through ingestion of colostrum. Maternal antibody titres in foals may offer a short period of protection against HeV. The ideal time to vaccinate foals is unknown. The project will involve bleeding foals at birth and then every month until vaccination. Blood samples will also be collected after vaccination of different aged foals. HeV titres will be measured. PhD level projects may also involve laboratory work in the validation of other diagnostic tests to measure HeV antibody titres.

Please **contact** Allison Stewart [allison.stewart@uq.edu.au](mailto:allison.stewart@uq.edu.au). Graduate student salary and tuition support is currently not included in the funds available for this project. Australian and Commonwealth students may be eligible for scholarships. We would welcome international students with home country financial support (academic performance greater than B+ and IELTS >6.5 overall and > 6 in each category). Limited UQ scholarships for international students are available for high outstanding applicants.

**For general enquiries on Honours studies in Veterinary Science, please contact:**

Dr Frances Shapter [f.shapter@uq.edu.au](mailto:f.shapter@uq.edu.au) for enquiries about the Bachelor of Science (Honours)  
–Gatton in Animal and Veterinary Bioscience

[http://www.uq.edu.au/study/program.html?acad\\_prog=2354](http://www.uq.edu.au/study/program.html?acad_prog=2354)

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Technology (Honours) [http://www.uq.edu.au/study/program.html?acad\\_prog=2422](http://www.uq.edu.au/study/program.html?acad_prog=2422)

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## **Recently Completed Projects**

### Reference intervals for equine adrenocorticotrophic hormone (ACTH) in Southeast Queensland

Pituitary *pars intermedia* dysfunction (PPID) is a common disease of older horses affecting more than 20% of horses older than 15 years of age in Southern Queensland. This condition is caused by neurodegeneration of the inhibitory dopaminergic hypothalamic neurons resulting in adenomatous hyperplasia of the *pars intermedia* and increased adrenocorticotrophic hormone (ACTH) concentrations. The typical clinical signs of PPID are hypertrichosis, chronic infections and hyper- or anhidrosis but one of the most severe problems experienced by affected horses is recurrent laminitis.

Measurement of basal ACTH concentration is the most commonly used method to diagnose PPID; however, because of circannual variability (higher ACTH concentrations in autumn), seasonal reference intervals should be developed by individual laboratories to accurately interpret ACTH results. In addition to circannual variations, regional variations have been described, indicating that reference intervals established at a specific latitude are not valid at another latitude, limiting the extrapolation of results from other institutions.

The purpose of this study is to establish ACTH reference intervals in Southern Queensland to improve the diagnosis of PPID. To achieve this goal, plasma samples will be taken from 50 healthy, ≥ 15-yearold horses monthly and reference intervals will be established for Southern Queensland.

This project is funded and has ethics approval.

**Contact:** François-René Bertin, School of Veterinary Science, [f.bertin@uq.edu.au](mailto:f.bertin@uq.edu.au).

#### **Publications:**

Horn, R., Stewart, AJ., Jackson, KV., Dryburgh, EL., Medina-Torres, C., & Bertin, FR. 2020. *Clinical implications of using adrenocorticotrophic hormone diagnostic cutoffs or reference intervals to diagnose pituitary pars intermedia dysfunction in mature horses*. DOI: 10.1111/jvim.16017

## Assessment of the diagnostic value of a combined thyrotropin-releasing hormone stimulation test and 2-step insulin response test to simultaneously diagnose Equine Pituitary Pars Intermedia Dysfunction and Equine Metabolic Syndrome

Pituitary pars intermedia dysfunction (PPID) and equine metabolic syndrome (EMS) are the most common hormonal disorders in adult horses. Although both conditions have been described worldwide, those diseases have a specific significance in Australia where it has been shown that more than 20% of aged horses are suffering from PPID and that more than a third of them are also suffering from EMS. Both conditions have a huge impact on equine health as they both result in laminitis. Prevention of the first painful episode of laminitis is critical when managing horses at risk of developing hormonal dysregulation.

As early detection of horses at risk is paramount in order to prevent the development of the first episode of painful laminitis, new diagnostic tools are needed. This project aims at assessing the diagnostic value of combining two sensitive tests to diagnose both endocrine disorders at once. To achieve this goal, control horses and horses with PPID, EMS and both will be tested with this novel diagnostic tool.

This project has ethics approval and funding .

**Contact:** François-René Bertin, School of Veterinary Science, [f.bertin@uq.edu.au](mailto:f.bertin@uq.edu.au).

### **Publications:**

Horn, R. & Bertin, FR. 2019. *Evaluation of combined testing to simultaneously diagnose pituitary pars intermedia dysfunction and insulin dysregulation in horses*. 2019. DOI: 10.1111/jvim.15617

Hicks, G.R.; Fraser, N.S.& Bertin, F.-R. 2021. *Changes Associated with the Peri-Ovulatory Period, Age and Pregnancy in ACTH, Cortisol, Glucose and Insulin Concentrations in Mares*. *Animals*; 11, 891. <https://doi.org/10.3390/ani11030891>

## Prevalence of *Toxoplasma gondii* and Feline Immunodeficiency Virus (FIV) in unowned cat populations in Brisbane, South-East Qld.

In Brisbane, feral cats are problematic and are subjected to ongoing management by local government. Unowned cats can reach high local densities, and potentially harbour and spread diseases of importance to public health and pets, livestock and wildlife conservation. There is increasing resistance from residents towards local government cat management programs. Information regarding the diseases carried by unowned cats, and the potential risks these may pose to residents, pets, livestock and wildlife, may assist local government to formulate informed awareness and education programs and may persuade more responsible pet ownership.

Limited studies indicate that feral or unowned cats can host a variety of endoparasites, ectoparasites and bacterial pathogens. Two diseases of particular concern include toxoplasmosis and Feline Immunodeficiency Virus (FIV). The prevalence of *T. gondii* and FIV in unowned cat populations in Brisbane is unknown, and implications for disease (and unowned and owned cat) management remain unclear.

This honours project will design and implement a study to investigate the prevalence of toxoplasmosis and FIV in unowned cats in the greater Brisbane City Council area. Specifically, this project will aim to sample unowned feral cats euthanized from management programs by Brisbane City Council. In Brisbane City Council, typically 800-1000 unowned cats per year are euthanized as part of ongoing management programs. Necropsy of selected animals provides the opportunity to sample a range of unowned cats for diseases of concern including toxoplasmosis and FIV. This project has strong support from Brisbane City Council, and will be jointly supervised by the University of Queensland, Brisbane City Council and Biosecurity Qld.

**Contact:** Cobbold; r.cobbold@uq.edu.au.

## Novel Herpesviruses in Australian flying foxes

Herpesviruses have been detected in bat species from several countries, with a limited number of studies examining herpesviruses in *Pteropus* species (flying foxes), and no investigation of herpesvirus in Australian flying foxes. Thus, the prevalence and characteristics of herpesviruses in Australian *Pteropus* species remains unknown. This study examined the presence and prevalence of herpesviruses in the four mainland Australian flying fox species. A nested polymerase chain reaction targeting highly conserved amino acid motifs in the polymerase gene of herpesviruses was used to analyse 564 bat samples collected from 514 individual *Pteropus alecto*, *P. scapulatus*, *P. poliocephalus* and *P. conspicillatus*. The prevalence of herpesvirus DNA in blood, urine, oral and faecal swabs from the four species was 17% in *P. scapulatus*, 11% in *P. poliocephalus*, 11% in *P. alecto*, and 9% in *P. conspicillatus* (31% in *P. conspicillatus* spleen tissue). Five novel herpesviruses were detected across the four flying fox species. Following sequence analysis, four of the herpesviruses grouped phylogenetically with the gammaherpesviruses, with nucleotide identities between 79% and 90% to gammaherpesviruses from Asian megabats. A single betaherpesvirus was detected in *P. scapulatus* with 99% nucleotide identity to the partial polymerase gene sequence of an Indonesian fruit bat betaherpesvirus. This study discusses the relationship of herpesviruses found in Australian flying foxes with those found in other bat species, lays the foundation for future epidemiology research of herpesviruses in Australian *Pteropus* species, and adds to the discussion of hypotheses surrounding the evolutionary epidemiology of bat borne viruses on a global scale.

**Contact:** Lee McMichael <l.mcmichael@uq.edu.au>

**Completed 2019:****Tracing the spillover of fleas (*Ctenocephalides* spp.) between native and domestic animals**

Spillover of parasites between wildlife and pets is a threat to animal health. Cat fleas (*Ctenocephalides felis*) and related dog fleas (*C. canis*) are among the world's most economically important ectoparasites. Both can infest domestic pets as well as a diversity of wildlife species. Yet knowledge on their distributions, particularly among wildlife, is poor. To provide the first assessment of ectoparasite populations among Australia's wild mammals, our team is currently sampling parasites from native and feral mammals across urbanization gradients in Southeast Queensland. The aims of this Honours project are twofold: (1) to contribute to wildlife trapping and surveying efforts; (2) to develop DNA markers that can be used to understand the influences of biotic and environmental features on the genetic population structure of cat fleas. Interests in genetics, wildlife sampling and data analysis will be appreciated.

Working as part of a vibrant research team, students will benefit in the following ways:

- Experience in sampling design and data collection in field and laboratory environments
- Quantitative analysis of complex datasets using script-based software
- Contributing to the planning, writing and submission of peer-reviewed publications

**Contact:** Dr Nicholas Clark; [n.clark@uq.edu.au](mailto:n.clark@uq.edu.au) and Prof Jenny Seddon; [j.seddon1@uq.edu.au](mailto:j.seddon1@uq.edu.au)