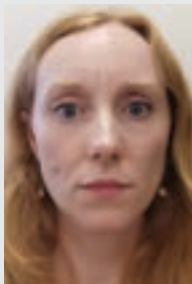




Veterinary Biosciences Student Summer Research Projects

Dr Alison Reynolds is Assistant Professor of Veterinary Biosciences and a member of the School of Veterinary Medicine Research Innovation and Impact Committee, where she is champion of undergraduate research. Here she gives an update on the 2022 undergraduate summer research projects within the Veterinary Biosciences Section



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Assistant Professor of Veterinary Bioscience

Dr Jane Irwin

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Amy Rand

Stage 3 graduate entry student

Eimear Byrne

Stage 5 veterinary medicine student

Fara Marin

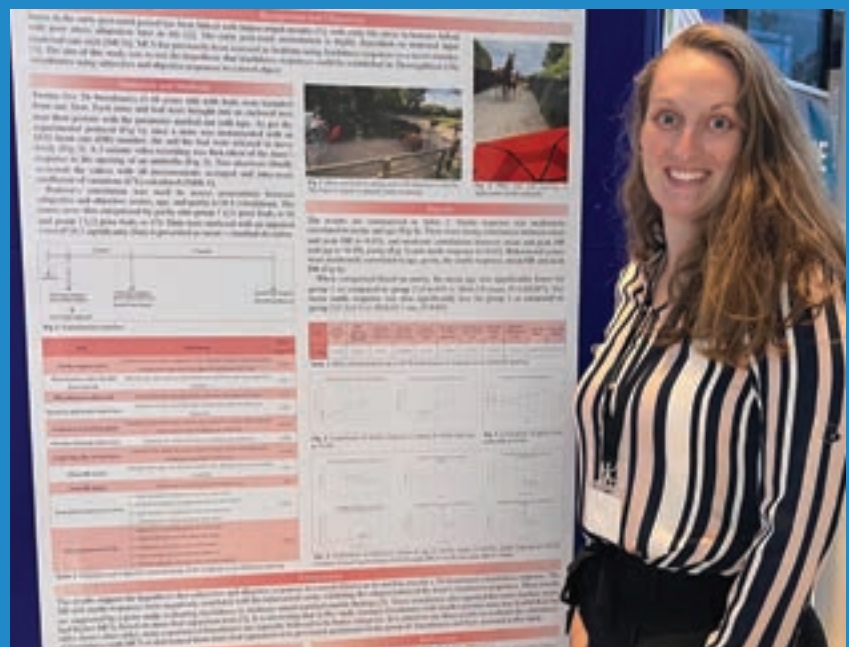
Stage 3 graduate entry student

This year has marked a return to the 'nearly normal' and with that a notable increase in the numbers of undergraduate veterinary and veterinary nursing students undertaking short summer research projects. Over 30 students were involved in research, mostly within the School of Veterinary Medicine, with 10 students undertaking the Department of Agriculture, Food and the Marine's Professional Work Placement Programme. Research in the Veterinary Biosciences Section within the School of Veterinary Medicine focuses on pre-clinical and translational research. Below is a selection of the summer research projects performed under the supervision of academics in the Veterinary Biosciences Section.

2022 SUMMER RESEARCH PROJECTS, VETERINARY BIOSCIENCES

Stage 5 veterinary medicine student

Clinical extramural studies



Amy Rand, Stage 3 graduate entry student, presenting a poster of her research at the Summer Student Research Awards, September 2022.

Stage 3 graduate entry student, Amy Rand, provides an overview of her clinical extramural studies experience earlier this year

This summer, I had the incredible opportunity of using my clinical extramural studies time to experience veterinary medicine through the eyes of research. I worked with Professor Lisa Katz and Dr Alexandra Moss subjectively and objectively analysing the behavioural responses of Thoroughbred broodmares to a novel object, with the goal of assessing their fearfulness responses. I was given the opportunity to assist in:

- development of the experimental design (based on a literature review);
- data collection from horses at the yard; and,
- data analysis.

During this time, I made invaluable professional connections with individuals in the equine, veterinary, and academic industry. I have always known that I wanted to pursue a veterinary career in the equine industry, but research has never really been on my radar. It is safe to say that after this summer, research has officially been added to the list of potential future directions I want my veterinary career to take. To be able to see a side of veterinary medicine that isn't solely clinical practice was incredibly eye-opening as it has inspired me to want to continue my education post-veterinary school through internships, residencies, and the potential PhD.

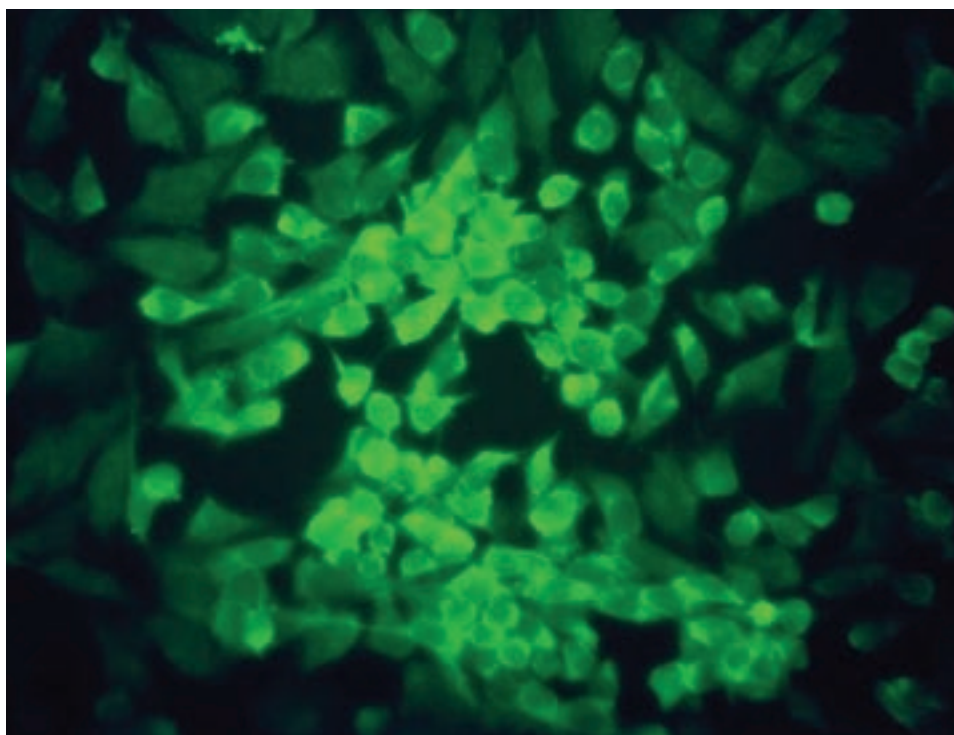


Figure 1: Cat mammary cell line stained (green) with an antibody that recognises the enzyme FUCA2, viewed under a confocal microscope.

Eimear Byrne conducted a project under the supervision of Dr. Sourav Bhattacharjee and Dr. David Kilroy, with funding from the Anatomical Society of the UK and Ireland. This project investigated the humeral supracondylar foramen in feline species and its evolutionary significance by acquiring micro-CT data. Using 3D imaging analysis software, such as FIJI and 3D Slicer, analyses revealed some crucial insights into the internal architecture of the supposed osseous walls of the supracondylar foramen and its correlation with the ligament of Struthers found in humans.

Fara Marin, a Stage 3 graduate entry student, worked with Biomedical Facility staff and Dr Alison Reynolds on a project focused on improving the ways we evaluate welfare in laboratory mice. Many research projects are carried out using laboratory mice and animals undergoing experimental procedures are scored daily to determine if they are in pain. Here, a qualitative behavioural assessment (QBA) approach was taken to see whether examining behaviour was an effective way to determine pain. Short daily videos were taken of the animals and 19 behavioural terms such as "inquisitive"/"playful" or "lethargic"/"agitated" were used to describe the behaviour of each animal. This QBA method seems quite effective at identifying behavioural expressions between different mice; however, more work must be done to validate the method.

Théo Fouché and Elisa Berty, second-year students from the École Nationale Vétérinaire in Toulouse, spent six weeks in the laboratory of Dr Jane Irwin. Their projects were based on an enzyme called alpha-L-fucosidase, which has two forms, one of which (FUCA2) is not well characterised. The enzyme removes a sugar called L-fucose from cells, and is of interest in cancer because it is thought to play a role in metastasis. Their projects involved the overexpression of this enzyme and studying its activity and expression in a human breast cancer cell line and a feline mammary cell line. Mammary cancer is the third most common cancer in cats, with this type of cancer similar to triple negative breast cancer, an aggressive form of breast cancer in humans. Cats are therefore a good model for studying breast cancer and investigating the similarities may lead to better therapies and outcomes for both human beings and cats.

ACKNOWLEDGEMENT

Summer research projects require the enthusiasm of our students and the support of supervisors, technical officers, postdoctoral researchers and PhD students who welcome students and give them valuable insights into working in research. We would like to thank the Anatomical Society and the School of Veterinary Medicine Research Innovation and Impact Committee for their ongoing support.