First Person – Eimear Byrne

Describe your scientific journey and your current research focus
I began my undergraduate Bachelor of Veterinary Medicine (MVB) at the University College of Dublin (UCD) in 2018. It became apparent very early on that anatomy was my favourite subject in the early years of vet school. Spending time in the dissection hall learning the internal anatomy of the cadavers was enthralling. I became intrigued by the supracondylar foramen in feline humeri and the evolutionary drivers behind it. I fortunately received funding from the Anatomical Society to investigate this foramen using micro-CT analysis. I am currently working as a veterinary surgeon, which provides me with ample opportunities to engage with such anatomical puzzles.

Who or what inspired you to become a scientist?
I am the first in my family to pursue a career in the science field. From a young age, I was inquisitive, wanting to know the ‘why’ behind how the ecological system and its living creatures exist. After attending a ‘women in STEM’ workshop in school, I began to consider the career options available to me that would incorporate my love for biology. I have always loved animals and had my heart set on becoming a veterinarian since childhood. With a stroke of luck and a little determination, I secured my place in the UCD Veterinary School, and my love for veterinary anatomy grew from there. I have my anatomy professors – David Kilroy and Sourav Bhattacharjee – to thank for my introduction to the world of research. If it wasn’t for their belief in me and for putting me forward for the Anatomical Society Undergraduate Summer Vacation Scholarship in 2020/2021, I may never have explored it as an avenue for a potential career.

How would you explain the main finding of your paper?
The supracondylar foramen’s inconsistency across species and its hypothesized function have been a topic of debate for quite some time. During an interspecies comparison, it became apparent that parallels can be drawn between the supracondylar foramen in felines, climbing mammals and marsupials, the entepicondylar foramen in amniotes and archaic dinosaurs and, finally, the ligament of Struthers in humans. We hypothesised that the supposed osseous outer rim of the (feline) supracondylar foramen represented an attachment of a now-obsolete muscle. I used micro-computed tomography (micro-CT) on feline humeri specimens as a non-invasive method suitable for examining delicate specimens without dismantling. Furthermore, the data provided a 3D rendition of the supracondylar foramen for visualization. We used FIJI as our data analysis tool of choice to produce numerical readouts and developed mathematical models. Our investigations confirmed our hypothesis that the peripheral arch of the supracondylar foramen lacks an internal osseous fabric, and it represents the tendinous attachment of a digressed muscle of the arm, which, most probably, is coracobrachialis longus muscle.

I used micro-computed tomography (micro-CT) on feline humeri specimens as a non-invasive method suitable for examining delicate specimens without dismantling.

What are the potential implications of this finding for your field of research?
This study established that the peripheral arch of the supracondylar foramen represents a tendon of a muscle that is now a vestige. It is difficult to speculate which muscle tendon it may represent; however, our data projected the coracobrachialis longus muscle as the most likely candidate. The use of micro-CT enabled investigation on such peculiar osseous structures, especially in delicate and
(relatively) small specimens like feline humeri without dismantling, which, in turn, can be applied to other unexplained osseous features often encountered in vertebrates.

**Which part of this research project was the most rewarding?**

There were many rewarding aspects to conducting this research project. I presented my data in an oral talk at the Anatomical Society Summer Meeting in July 2022. This was daunting at first, as it was my first venture in front of an erudite audience. However, I quickly found myself at home surrounded by like-minded individuals who shared a united love of anatomy. The one aspect for which I am most grateful is the collaboration with my corresponding author and mentor, Dr Sourav Bhattacharjee. I was in awe of his intelligence and perseverance while coming across many hurdles during the project. I learnt that instead of becoming discouraged by setbacks, they should fuel our determination to overcome them. This allows for the greatest sense of achievement when you finally do make that breakthrough. He instilled self-confidence in me that I had what it takes to apply myself and yield results. The world of research is more familiar now and less of an enigma than it was before, and I am so grateful for the rewarding journey it has been.

I learnt that instead of becoming discouraged by setbacks, they should fuel our determination to overcome them.

**What do you enjoy most about being an early-career researcher?**

Having a career in research has provided me with the unique opportunity to explore an area of interest beyond the known territories. The opportunities are endless, and the need for research is paramount to expanding our knowledge of the world or emerging as a responsible physician, researcher, and citizen. In combining one’s ability, commitment, and determination, anything is possible, and that, to me, is extraordinary.

**What piece of advice would you give to the next generation of researchers?**

Attend conferences! They provide a great opportunity to network with fellow researchers both in and outside of your comfort zone. They may even inspire collaboration on a new project.

**What’s next for you?**

I graduated as a veterinary surgeon in 2023 and have been working in clinical practice since then. Caring for animals is extremely gratifying and rewarding, and I intend to continue with my vocation to contribute to their health and wellbeing. I hope to stay involved in research in some capacity; however, I am yet to finalise my next research venture.

**Reference**