Anatomy at the Royal Veterinary College

History of the Royal Veterinary College

The Royal Veterinary College is the oldest Veterinary College in the UK, with a proud heritage of innovation in veterinary science, clinical practice and education.
It was founded in 1791 in what was then a rural area north of London, but is now in the heart of central London, close to Camden Town and the St Pancras Eurostar terminal. The college still occupies this original site and this campus houses the Hobday building (teaching and research facilities), the Beaumont Sainsbury Animal Hospital (clinical services) and the London Biosciences Innovation centre (Biotech innovation hub).

The Hobday Building, central London campus

The college opened a second campus in 1959 at Hawkshead, close to Potters Bar (Hertfordshire) in 1959, which houses clinical teaching and research facilities as well as the newly refurbished state of the art Queen Mother Hospital for Animals.

The Eclipse Building, Hawkshead Campus

The College is internationally recognised for excellence in animal research, with a multidisciplinary approach extending from the molecular level to the whole animal or population of animals. The disciplines underpinning these themes include Animal Welfare, Biomechanics, Genetics, Bioinformatics, Pathology and Epidemiology and Public Health.

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Teaching

The college offers undergraduate degrees in Veterinary Medicine and BioVeterinary Sciences. The teaching of Anatomy is a key component of both courses and is taught using an integrated, systems based approach. Staff from the Dept of Comparative Biomedical Sciences are largely responsible for the delivery of anatomy teaching which takes place in out well equipped dissection facility at the Camden campus.

Public Engagement and Widening Participation

The RVC has developed an innovative and award winning public engagement programme in order to inspire anatomists, biological scientists and veterinary surgeons of the future.

"*Afternoon Anatomy*" at the RVC brings school children of all ages into our extensive Anatomy Museum to learning about how animals and people are put together. This activity involves the pupils identifying a set of bones, both domestic and exotic, using the specimens in the museum and the expertise of our anatomy staff and Student Ambassadors.

Once they have got to grips with what is going on under the skin, they don lab coats and stethoscopes and examine live animals, including a pony, cow and dog. This is open to young people from 8 to 18 years old and the focus is on schools in urban areas. For many of these students it will be the first time they have ever seen a cow. Having been featured on the BBC's Asian Network and visited by HRH Princess Anne, the event remains one of the flagship activities of the RVC's Widening Participation initiative.

"***Teaching the teachers***" is an initiative to help teachers gain or improve skills in dissection. This was prompted by observations that the school curriculum had moved away from the fundamentals of anatomy and teachers were not necessarily trained or equipped to teach the discipline.
Mr Andrew Crook, chief Anatomy Technician decided to devise a programme that went back to the beginning and re-inspire biology teachers in the benefits of dissection to promote deeper understanding. This "At the Cutting Edge" event is heavily oversubscribed. For his work on this programme and other public engagement events, Andrew Crook was awarded an MBE in the New Years honours list 2012.

Research

Structure and Motion Laboratory

The world leading Structure and Motion Laboratory (SML) addresses fundamental questions relating to how and why animals are structured and move as they do, how movement is controlled and how performance is delivered or limited. This is achieved using a combination of anatomical measurements, imaging, experiential work and computer modelling. The laboratory houses state-of-the-art facilities for studying the biomechanics of locomotion; much experimental research is also undertaken in the field. The SML research team is diverse including vets, biologists, palaeontologists, engineers and computer scientists, supported by technical and administrative staff. Full details of all members of the group can be found at http://www.rvc.ac.uk/SML/People/Index.cfm

The head of the SML is **Professor Alan Wilson**. Alan's team's research has encompassed a range of subjects, from the study of individual muscle fibres and tendons, to whole animal locomotion, to how whole groups of animals work together. This has included species as diverse as humans, horses, greyhounds, ostriches, camels, wild dogs and cheetahs, with plans for others in the future. Alan's research interests relate to anatomical specialisation for

economy and performance.

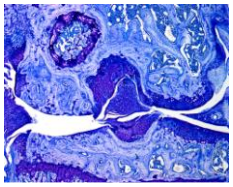
Other notable researchers with anatomically themed research interests include **Professor John Hutchinson** and **Dr Monica Daley**.

Professor Hutchinson is a Professor of Evolutionary Biomechanics whose team's research considers how very large animals stand and move and how locomotion evolved in different groups of land vertebrates. John was awarded the RCVS Share Jones Lecture in Veterinary Anatomy in 2011, and the Charles Darwin Award lecture at the British Science Festival in 2012.

Dr Daley is an integrated physiologist, whose team strive to reveal the basic principles of how muscle-tendon architecture, leg morphology, body size and terrain environment influence bipedal locomotion. They also collaborate with engineers to work towards translating basic principles into biologically inspired technology such as prosthetics and legged robots.

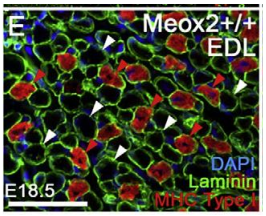
Musculoskeletal Biology

The RVC houses a dynamic and active Musculoskeletal Biology research group. Anatomists who form part of this group include:



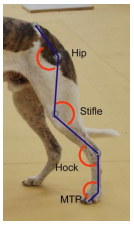
Osteoarthritic joint

Andrew Pitsillides, Professor of Skeletal Dynamics. Andrew and his research team study how embryonic, growing and adult skeletal tissues, especially joints and bones, adapt to changes in the mechanical demands placed upon them.



Neuromuscular junction

Dr Raymond Macharia, Senior Lecturer in Comparative Biomedical Sciences has an interest in vertebrate muscle growth and development. He is currently investigating weakness in hypertrophic muscles in Myostatin(GDF-8) null mice and the role of MyoD gene in the development of the skeletal neuromuscular junction.



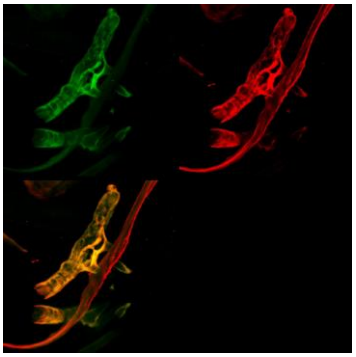
Dr Sarah Williams, Lecturer in Veterinary Anatomy is a comparative anatomist. She is currently researching how the structure of the musculoskeletal system alters during growth, and how it adapts to altered mechanical loads such as following limb amputation.

Dr Vicki Waring is a Lecturer in Veterinary Anatomy. Her current research is on the effect of diet on the development and degeneration of skeletal tissues, specifically the underlying mechanisms linking the alimentary and skeletal systems.

Developmental Biology

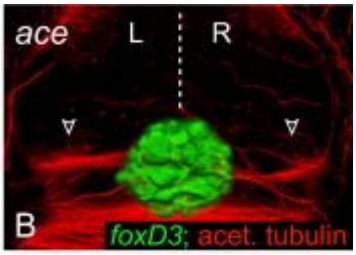
The developmental biology group has a broad focus on comparative aspects of embryonic development and the researchers in this unit use a wide variety of models in their research

Dr Imelda McGonnell, Senior Lecturer in Anatomy and Developmental Biology. The main research theme of this group is how craniofacial structures form during development and how interactions between the skeletal tissue and nervous system control patterning. Currently the group is investigating whether Chairi malformation of the skull is a developmental defect and are using naturally occurring disease models in canines as well as standard laboratory models to investigate this question.



Zebrafish cranial skeletal development

Dr Claire Russell, Lecturer in Comparative Biomedical Sciences. Focussing on developmental neurobiology, this group predominantly uses the embryonic and larval zebrafish to understand the development and maintenance of a healthy nervous system. Combining anatomical, physiological and locomotion assays with genetic, molecular, tissue and chemical manipulations allows us to dissect gene and protein function as well as model diseases that affect humans and animals such as neurodegeneration and epilepsy.



Zebrafish epithalamus