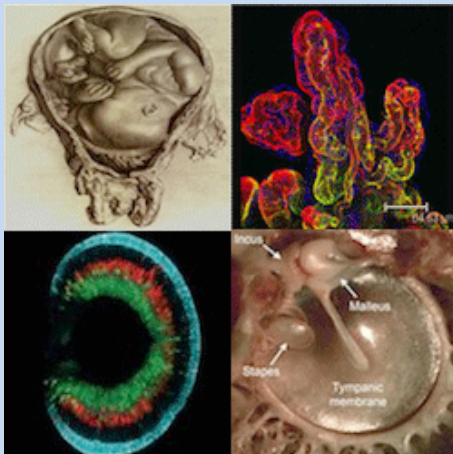


## Anatomy

### The Department of Physiology, Development and Neuroscience



On January 2006 the Department of Physiology, Development and Neuroscience, (PDN), was formed from the merger of the Departments of Anatomy and Physiology, this created one of the largest departments in the School of Biological Sciences. Research in PDN is primarily conducted in four major areas: Cellular and Systems Physiology, Neuroscience, Form & Function and Developmental and Reproductive Biology. PDN remains the home of Preclinical Teaching in Anatomy and Physiology for both medical and veterinary students. It is also a main contributor to the Natural Science Tripos in the areas of Physiology, Developmental Biology, and Neuroscience. PDN accommodates the Centre for Trophoblast Research and has strong collaborative links with the other departments in School of Biological Sciences and with the Clinical School, the Cambridge Centre for Brain Repair, the Cambridge Stem Cell Institute, and the Gurdon Institute. Support facilities for both teaching and research include the Multi-Imaging Centre, the Cambridge Advanced Imaging Centre and the Audio Visual Media Group.



### Research Activities

The central aim of our research activity is to understand the relationship between Biological Structure and Function.

**Cellular and Systems Physiology** has a strong presence across PDN. It consists of researchers primarily interested in either cell functioning or the way in which groups of cells co-ordinate their activities.

Naturally this theme has some overlap with both

neuroscience and developmental biology, but our researchers work on fundamental aspects of physiology that have a broader relevance than simply to either Neuroscience or Development alone. This theme is broadly divided into three main areas: calcium handling in cells, excitable and sensory cellular physiology and circulatory physiology.



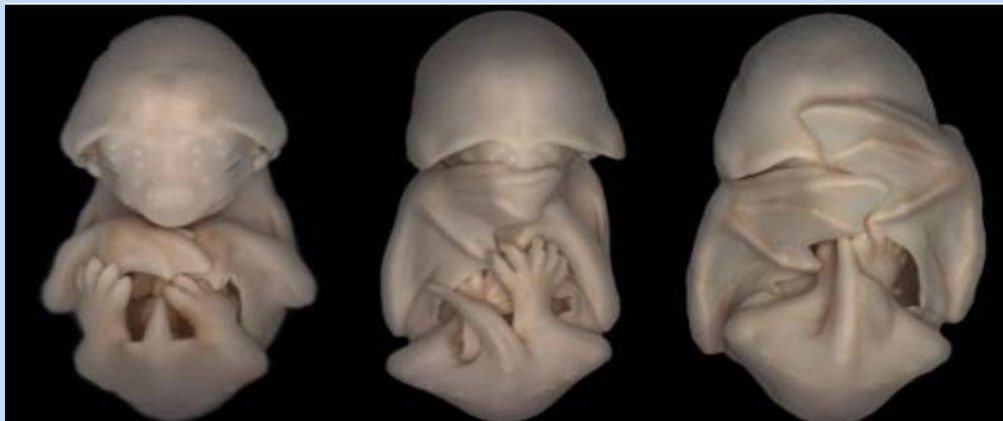
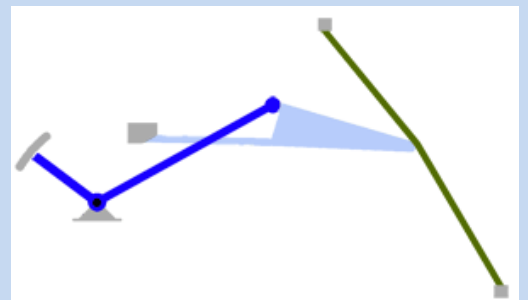


Cambridge has a strong tradition in **Neuroscience**, having hosted the first analyses of neural signalling in the 1930s (Matthews, Adrian), determination of the mechanisms of action potential generation in the 1950s (Hodgkin & Huxley), and some of the first theoretical approaches to function in brain circuits since the 1960s (Marr, Barlow). Neuroscience at Cambridge continues to grow and to incorporate new ideas and new approaches. This breadth of interest and expertise is reflected in the diversity of research in the merged department, with integration across disciplines and departments.

For descriptive purposes our Neuroscience research can be divided into three 'levels', cellular & molecular, systems and behavioural.

The work of the **Form and Function** group may be summarised as:

- Molecular mechanisms underlying control of cell shape, movement and cell-cell interactions.
- Reorganisation and assembly of cells into functional organs.
- Biomechanics of movement, at cellular and macroscopic levels.
- Functional consequences of tissue shape: middle ear, gastrointestinal tract, cardiopulmonary system and nervous system.
- The interface between cells and extracellular structures.



Fundamental questions that the **Developmental Biology and Reproduction** group seek to address are: How are myriads of different cells made, organised into tissues, arranged in the correct places and co-ordinated functionally to form an animal? Work in three distinct areas concerns neural population programming, germ cell development and the role of genomic imprinting and environmental signals in programming intrauterine development.

In addition to four key research areas two specialist centres exist:

The **Cambridge Advanced Imaging Centre** is a visionary initiative to promote multidisciplinary working across the University on the application of advanced imaging technology to biology.

The ultimate aim of the **Centre for Trophoblastic Research** is to alleviate suffering resulting from placentally-related complications of pregnancy that remain a major cause of maternal and infant morbidity and mortality worldwide.

## **Undergraduate Teaching Activities.**

### **Veterinary Anatomy**

The department is responsible for all the anatomical teaching of veterinary students during their pre-clinical course. In the first year students receive an introduction to the anatomy of the major domestic species, and in the second year this is continued into courses on neuroanatomy, reproductive anatomy and the biology of non-mammalian vertebrates and 'exotic' mammals. Facilities include a dedicated animal dissection room, a dry teaching laboratory, imaging facilities and a library of books, radiographs and MRI images. Teaching consists of lectures, practicals and live animal work. The group aims to emphasise the science underpinning the study of animal structure while constantly emphasising the clinical links of the course.

### **Medical Anatomy**



The department teaches anatomy to all medical students during their pre-clinical course and provides revision for clinical students.

Teaching integrates dissection, lectures and practical classes. The course is based largely on cadaveric dissection but also employs prosections, lectures, small group teaching and Applied Anatomy sessions comprising of case-based learning, patient presentations, radiological and living surface anatomy. Within the main undergraduate course (Functional Architecture of the Body), students dissect all regions of the body except the head and viscera of the neck. Head and Neck Anatomy is taught as a second year course parallel to Neuroanatomy.

The students have no further formal anatomy teaching until their first year of clinical study (fourth of a six year medical degree) when they re-attend the dissecting room for a series of revision sessions consisting of clinical vignettes with accompanying cadaveric prosections. This is designed to emulate OSCE assessments encountered in clinical years.

Out of term the Department holds courses including: RA-UK Cambridge Cadaveric Anatomy and Ultrasound Guided Nerve Block Course, ENT Sinus Surgery, Anatomy for ENPs and a variety of revision sessions.