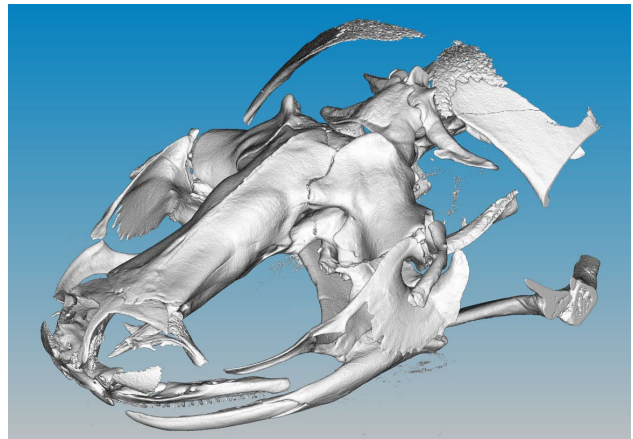
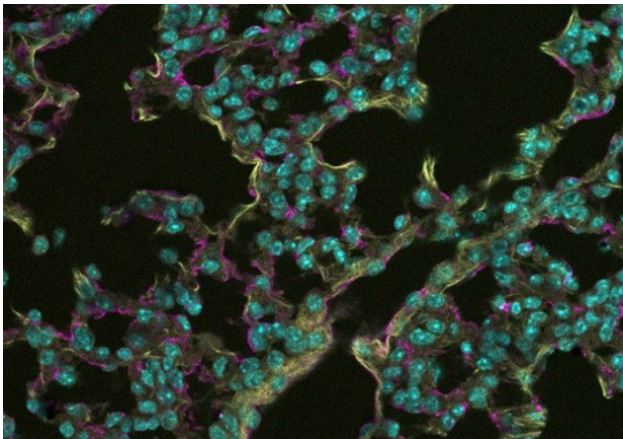
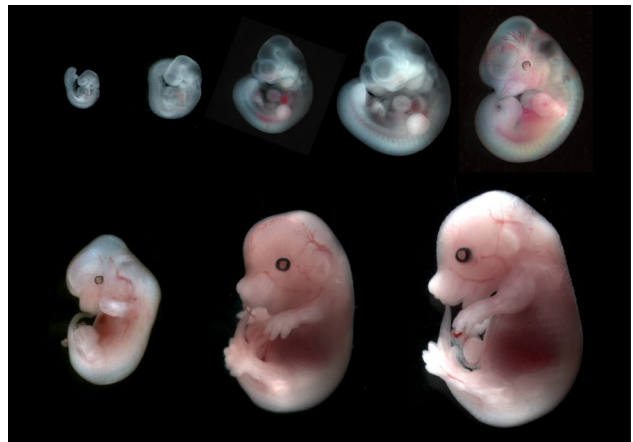
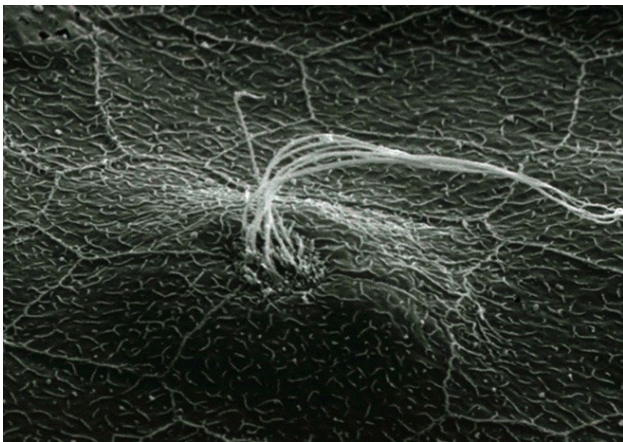




# pdn part II

Department of Physiology,  
Development and Neuroscience

2026-2027



UNIVERSITY OF  
CAMBRIDGE

# PART II PHYSIOLOGY, DEVELOPMENT AND NEUROSCIENCE 2026-2027

*Course Organisers: Profs. Hannah Clarke and Amanda Sferruzzi-Perri*

## **INTEGRATIVE PHYSIOLOGY**

*Theme Organiser: Dr James Fraser*

## **DEVELOPMENT AND REPRODUCTIVE BIOLOGY**

*Theme Organiser: Prof Nick Brown*

## **NEUROSCIENCE**

*Theme Organiser: Prof Angela Roberts*

### **General enquiries:**

Part II Administrator, Room C6, Physiology Building. email: [part2@pdn.cam.ac.uk](mailto:part2@pdn.cam.ac.uk)

Department of Physiology, Development and Neuroscience website:

<http://www.pdn.cam.ac.uk/>

Part II Physiology, Development and Neuroscience webpage:

<https://www.pdn.cam.ac.uk/undergraduate/part-ii-courses>

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## INTRODUCTION

Part II in Physiology, Development and Neuroscience offers a broad range of teaching and project opportunities covering the full spectrum of interests within the Department. Our Part II teaching is organised into modules to provide maximum flexibility enabling students to design a course to match their own interests.

The Department of Physiology, Development and Neuroscience is focussed on material central to the life sciences. It addresses questions about the way that cells, tissues and organs develop and function in people and animals. Physiology, Development and Neuroscience are broad but interlinked subjects with many different areas of specialisation. A good grounding in these subjects opens the way to a wide variety of careers: these range from those where you use your knowledge directly, to those in which the understanding you will acquire of complex organisms is put to work less directly, such as in managing equally complex human organisations.

The knowledge and skills gained on this Part II course will provide a valuable basis for the practice of human and veterinary clinical medicine, where a critical understanding of scientific advances is essential in designing and evaluating new treatments. The course offers fundamental insight into how the human body and other animals function, making it highly relevant for natural sciences biology students for scientific research. Many parts of the course concentrate on important research areas where recent discoveries have changed our knowledge of disease processes and have posed new questions to be answered. The modules are organised into three themes, allowing you to spend the whole of your third year studying in depth Integrative Physiology, Development & Reproductive Biology or Neuroscience. Alternatively, those seeking a broader overview can select to follow a more general course, combining modules across these themes.

One major benefit of studying Part II Physiology, Development and Neuroscience will be in gaining an in-depth knowledge of key core areas of the life sciences. You will also gain important knowledge and skills that graduates in any subject should these days have. These skills include:

- critically assessing information you read or hear
- keeping accurate records
- writing reports and reviews, and effectively presenting and communicating your ideas
- efficiently using libraries and information databases
- selecting appropriate statistical procedures to verify hypotheses
- using modern computer software

Teaching of the course involves most members of staff of the Department of Physiology, Development & Neuroscience and is supplemented by invited specialists from across the University and from the Gurdon Institute, the Medical Research Council Laboratory of Molecular Biology, Cancer Research UK and Addenbrookes and Papworth hospitals. We also offer a growing number of modules taught in collaboration with other Departments, allowing us to call upon the broadest range of expertise within the University.

Taking Part II in Physiology, Development & Neuroscience gives you the many advantages of a home base on the Downing Site. You will immediately feel an important contributing part of the vibrant research community. The social cohesion with your fellow Part II students will be enjoyable and valuable throughout the year and your academic and other questions can be informally dealt with when you happen to meet members of staff about the Department. You will be appointed a Departmental Advisor who will be available to discuss your progress and help support you in your studies. The friendly and supportive Part II administrator will become well known to you and will be your first port of call for queries. The Department has numerous resources available to you through the year, including a well-stocked library, where you will be able to find many of the books and journals you need in a single place. The Department also maintains computers and printers which you will be able to access.

### ***The scope of the course***

You will probably already have an overview of some or all of physiology, development and neuroscience from your Part I courses and we will therefore build upon these basics by offering an in-depth course in which we will not attempt to cover the whole of these subjects. We offer teaching on topics of current interest that we discuss to a much higher level than in Part I. This means that you can devote your time to those areas you find particularly interesting. While we expect that the majority will have done the Part IA and IB courses in physiology, developmental and/or reproductive biology or neurobiology, we will also welcome those who have done only one of these courses, as well as those who approach physiology, development and neuroscience from other directions, such as biochemistry, genetics or animal biology.

### ***The organisation of the course***

All project students study four modules. The course offers a wide choice of modules across three themes: Integrative Physiology, Development & Reproductive Biology and Neuroscience. Some students will want to study one theme and others enjoy the opportunity to follow a more general course by combining modules from multiple themes. Students are free to choose how to distribute those four modules over the two terms, for example: two in Michaelmas and two in Lent is usual although three in Michaelmas and one in Lent etc. is possible. (see module descriptions from page 9).

In your detailed reading you will want to concentrate on the topics that particularly interest you. In the examination there will be one paper per module. Much of your formal teaching will take place during the morning. Many modules also offer workshops, journal clubs or seminars in the afternoons. These give opportunities for a more interactive style of teaching that many students enjoy and find helpful in consolidating the lecture material. Most afternoons during Michaelmas and Lent terms are free for project work and private study. The Easter Term is kept free from formal commitments to allow time for reading and for discussion.

### ***The Projects***

All project students do either an experimental research project or a theory-based project, under the supervision of an appropriate member of staff. Laboratory-based research projects are limited in number and allocation cannot be guaranteed to all students who wish to do these. The findings are written-up in the form of an 8,500-word report. During Lent term, you will have the opportunity to present your progress to members of the Department as a poster presentation. The times that you work on your project can be negotiated with your supervisor to some extent so that you will have time available for other work and outside interests, but in general, students are expected to spend about 16 hours a week on their project. The titles of a number of recent research projects are listed towards the end of this booklet, as are some of the publications arising from projects involving previous Part II students.

### ***The Project Allocations Process***

Soon after the NST part II allocations are complete, project students are provided with a broad list of project titles provided by PDN members. Students are invited to discuss these titles with potential supervisors and submit preferences for individual projects.

All titles are available to all project students, although specific skills may be essential for some projects. Requirements will be outlined in the title list and online discussions with potential supervisors may be necessary before allocation. We do not use grades, rank or any other metric to allocate projects. This ensures that the whole cohort has access to the same opportunities. Titles are arranged before the start of term so work can begin right at the start of your part II year.

## **PART II PDN: A strategic analysis**

### ***Our aims***

- To provide a broad multidisciplinary course in Physiology, Development & Neuroscience.
- To teach you a variety of scientific skills that will equip you for future careers in a wide range of areas: health sciences (e.g. the pharmaceutical industry and environmental physiology), medicine and veterinary medicine, research in the life sciences and related disciplines, teaching, publishing and management.

### ***How we expect to achieve them***

- By offering a modular course of lectures, workshops, seminars, informal discussions and research projects, supplemented by personal contact with members of academic staff.
- By training you in the use of practical and conceptual tools required in many sub-disciplines: from molecular biology, through membrane and cellular physiology, to the study of systems physiology and the disorders of physiology associated with disease.
- By providing constructive feedback on your progress through personal discussion and assessment of project work.

### ***What you can expect by the end of the course***

The ability to:

- think and write critically and creatively about what you have read, learnt and discovered.
- analyse, both qualitatively and quantitatively, data collected from research projects.
- use available resources to conduct research into scientific problems, e.g., libraries and computer databases, together with academic and technical expertise.
- assess and implement practical techniques necessary to solve a particular scientific problem.
- communicate with expert and non-expert audiences through presentations, project reports and essays.

## **PART II PDN COMMON COURSES: Skills for all PDN students**

There are some skills which we think that everyone doing part II in PDN needs to acquire, regardless of their area of specialisation. For this reason, we offer a programme of skills sessions to all PDN students.

### **Topics to be included:**

- Literature searching
- Reading and evaluating a scientific paper
- Note taking from papers
- Reference management
- How to write a Part II essay
- Statistics and data analysis
- How to answer experimental design questions
- Poster and figure making
- Project write-up guidance
- Information regarding the PDN Part II examinations

## WHAT TO DO IF YOU ARE INTERESTED IN APPLYING:

***Two application forms must be completed:***

### 1. **The PDN Departmental Application:**

If you want to take our Part II Physiology, Development and Neuroscience or BBS Major course (415) it is essential that you complete our internal application form:

<https://forms.office.com/e/Q0AFuWuHWt>



**We cannot allocate you a place if this form is not completed.**

### 2. **The University NST Application:**

Formal application to take the course **must** also be made to the NST Part II allocations team after consultation with your Director of Studies.

Details and the NST deadlines can be found on the Natural Sciences webpage: <https://www.natsci.tripos.cam.ac.uk/students/third/ii-subject-allocation>

**You should make all of your initial Part II applications by Friday 22<sup>nd</sup> May 2026**

A copy of this brochure and the PDN application form link are also available on our website: <https://www.pdn.cam.ac.uk/undergraduate/part-ii-courses> and your [Subject Fair Moodle page](#)

#### **NOTE:**

*This booklet describing the Part II Physiology, Development and Neuroscience course was produced in February. Some small details may change. Some lecturers may change because of timetabling or leave commitments.*

## **PART II BBS: Options in PDN**

The Part II BBS course is for students who want a course based entirely on lecture and library work, with no practical component. Students take a major subject (consisting of four PDN modules), a minor subject (one module from those offered as a minor), and write a dissertation.

### **MAJOR SUBJECT 415: Physiology, Development and Neuroscience**

*Maximum 28 places*

*Course Organisers for PDN: Profs. Hannah Clarke ([hfc23@cam.ac.uk](mailto:hfc23@cam.ac.uk)) and Amanda Sferruzzi-Perri ([ans48@cam.ac.uk](mailto:ans48@cam.ac.uk))*

BBS students must take 4 of the PDN modules as their major subject, under the auspices of Part II PDN (see module descriptions from page 9 onwards).

### **MINOR SUBJECTS:**

Some PDN modules are also offered as BBS minor subjects. PDN Major subject 415 may be taken with a PDN-based minor subject, provided that the minor is different to the four modules taken as part of the major subject.

Michaelmas Term minor options within PDN:

- 138: Module N1      Developmental Neurobiology (5 places)
- 152: Module N3      Neuroscience: Circuits and Systems (5 places)
- 153: Module P1N4   Cell Signalling (5 places)

Lent Term minor options within PDN:

- 111: Module N6      Higher Order Brain Function and Dysfunction (5 places)
- 142: Module P2      Development and Stem Cells (5 places)
- 143: Module P8      Systems and Clinical Physiology (5 places)

PDN Major (415) may be taken with other minors that do not have timetable clashes, including:

- 137:    Surgical and Radiological Anatomy (SaRA), run by PDN but only as a two-term BBS minor subject (see page 17 for minor 137).

## SUMMARY OF PART II PDN THEMES AND MODULES

Integrative Physiology (P)	Development and Reproductive Biology (D)	Neuroscience (N)
<b>Michaelmas term</b>		
P1N4 Cell Signalling	N1 Developmental Neurobiology ( <i>shared with Part II Zoology</i> )	N1 Developmental Neurobiology ( <i>shared with Part II Zoology</i> )
P3 Fetal and Placental Physiology	P3 Fetal and Placental Physiology	N2 Experimental Tools for the Neuroscientist and how they are Shaping Scientific Discovery
	P4 Early Development & Patterning: Genetic and Cellular Mechanisms ( <i>shared with Part II Genetics and Zoology</i> )	N3 Neuroscience: Circuits and Systems
	P9 Cell Assembly and Interactions ( <i>shared with Part II Zoology</i> )	P1N4 Cell Signalling
<b>Lent term</b>		
P2 Development and Stem Cells	P2 Development and Stem Cells	N6 Higher Order Brain Function and Dysfunction
P7 Pathophysiology of Cancer	P6 Development: Cell Differentiation & Organogenesis ( <i>shared with Part II Zoology</i> )	N9 Modulation, Plasticity and Behaviour
P8 Systems and Clinical Physiology	P7 Pathophysiology of Cancer	

## THE PDN COURSE MODULES

The themes to which individual modules belong are indicated as follows:

(P) Integrative Physiology, (D) Development and Reproductive Biology and (N) Neuroscience.

### **Michaelmas Term Modules**

#### **Module N1: Developmental Neurobiology (D, N)**

*(Inter-departmental module with Zoology)*

*Module organiser: Prof. Clare Baker ([cvhb1@cam.ac.uk](mailto:cvhb1@cam.ac.uk))*

This module addresses how the nervous system is assembled during embryonic development. Although we now understand a considerable amount about the processes involved, many fascinating questions remain.

We begin by discussing the formation of the vertebrate neural tube (future brain and spinal cord), and how this is patterned to generate distinct neuronal fates in different regions, including the cerebral cortex. We also consider the evolution of the cerebral cortex and the potential for regeneration within the brain. Once neurons have formed, they extend axons to their targets to 'wire up' the nervous system: the process of axon guidance is considered in detail. We discuss the formation of the peripheral nervous system from the migratory neural crest and cranial neurogenic placodes (good models for understanding the control of cell migration and fate-choice). We discuss how circuit designs lead to function, and we explore how axons make and refine the synapses that will generate functional neural circuits.

This is an interdepartmental course (with Zoology), given by researchers in the Departments of PDN, Genetics, Zoology, and the MRC Laboratory of Molecular Biology.

It is best suited for students who have studied some neurobiology in Part IB, either in MedST/VetST or in NST, but others will be able to take it if they are prepared to do some background reading.

#### **Module N2: Experimental Tools for the Neuroscientist and how they are Shaping Scientific Discovery (N)**

*Module organiser: Prof. Angela Roberts ([acr4@cam.ac.uk](mailto:acr4@cam.ac.uk))*

This module will consider the current generation of experimental tools available to the neuroscientist and how their application is contributing to our understanding of brain organisation and function. The range of state-of-the-art technologies and approaches will include opto- and chemo-genetics, multichannel recording, single and multiphoton calcium imaging, multimodal MRI, computational modelling and brain organoids. Not only will you learn about the neurobiological foundations of each experimental tool, but also how it is transforming our understanding of neuroscientific topics ranging from sensory perception and motor control to memory and higher-order decision making.

Teaching will be a mixture of traditional lectures, interactive sessions and student-led presentations. Along the way, you will gain core generic skills of scientific presentation, scientific debate and critical reading of primary scientific papers. By the end of the module, we hope you

will have a comprehensive overview of the landscape of neuroscientific research and how the different techniques and experimental approaches provide insight into brain function across multiple levels of analysis from molecules and cells at single synapses to local and large-scale neural networks.

This module complements any of the other neuroscience modules. It is recommended especially for those neuroscientists wishing to take the 'neuroscience theme' in PDN, taking four neuroscience modules alongside a two-term neuroscience research project. It replaces the workshops for 'neuroscience theme' students that we have run in PDN for many years

### **Module N3: Neuroscience: Circuits and Systems (N)**

*Module organiser: Dr David Parker ([djp27@cam.ac.uk](mailto:djp27@cam.ac.uk))*

We know a lot about the brain in terms of its molecular and cellular properties, and of the role of different brain regions in behaviour. What we lack is insight into how the molecular, cellular, and circuit properties of brain regions generate cognitive functions and behaviours. This is widely considered to be the major problem facing neuroscience and of biology generally.

This module will consider this problem by considering how cellular interactions in neuronal circuits and neural systems generate cognitive functions and behaviours.

The module will focus on various conceptual aspects and experimental approaches to circuit/system understanding. Lectures will start with an introduction to neural circuits/systems and their analysis. This will be followed by consideration of connectomic analyses of neural circuits underlying sensory and motor function. Lectures will then focus on hypothalamic circuits underlying reproductive functions and metabolism. Neural systems will then be considered, with lectures on visual system pathways and the role of the vestibular system in perception and spatial navigation. The module will finish with an introduction to artificial neural networks and their role in system and circuit understanding.

A large number of students have taken the module in the two years it has run, and this makes it difficult for all lecturers to give conventional supervisions or read and comment on essays. At a minimum each lecturer will give a Q&A session a week after their lectures to address questions from the lecture material. In previous years some lecturers have done additional Q&A sessions when there is demand and held sessions where they work through approaches to essay questions.

The module will include interactive student debates that will discuss topics that cover the content of the module. In the past this has included the relative merits of experimental approaches (e.g., imaging compared to electrophysiology, will the 'photon replace the electron'); the relative merits of experimental and computational analyses to claims to understanding; what we can learn about brain function from brain injuries; and the relative merits of naturalistic behaviours vs those examined under controlled conditions.

This module complements any of the neuroscience modules. P1N4 provides complementary cellular detail, and P8 a complementary systems perspective.

## **Module P1N4: Cell Signalling (P, N)**

*Module organiser: Dr Ali Rasooli-Nejad ([smar4@cam.ac.uk](mailto:smar4@cam.ac.uk))*

Deep mechanistic understanding of organs and systems must include an appreciation of cellular and molecular properties and interactions. Neuronal and non-neuronal cells detect and respond to changes in their external environment using many signalling pathways. In this module we look at cellular signalling involving ions, including sodium, calcium and protons.

The lectures will cover: how ions enter cells via voltage and ligand gated ion channels; how their concentrations are regulated in cellular microdomains; how they influence cell signalling; and what the consequences of this are for neuronal and non-neuronal cells, including action potential firing, sensory transduction, synaptic plasticity and glial cell function. The lectures will emphasise research approaches used to study these signalling pathways.

This Module works particularly well with N1, N2, N3, N9, and P8.

## **Module P3: Fetal and Placental Physiology (D, P)**

*Module organiser: Prof Dino Giussani ([dag26@cam.ac.uk](mailto:dag26@cam.ac.uk))*

The study of the fetus and placenta is a unique aspect of physiology with relevance for basic and clinical sciences. This module will explore a wide range of topics, including the normal development of the fetus and placenta, adaptations to the intrauterine environment, responses to challenges in utero, mechanisms of parturition and the transition at birth. The scientific basis underlying the aetiology of miscarriage, preeclampsia and sudden infant death syndrome, and the consequences of prematurity, maternal obesity and intrauterine growth retardation will be discussed.

In addition, the course will give insight to current ideas on the developmental programming of health and disease.

Modules that complement P3 are: P2 for a developmental focus, P4/ P6 for students interested in cellular/morphological changes and P7/P8 for a wider physiology or pathophysiology theme.

## **Module P4: Early Development & Patterning: Genetic and Cellular Mechanisms (D)**

*(Inter-departmental module with Genetics and Zoology)*

*Module organisers: Alberto Rosello-Diez ([ar2204@cam.ac.uk](mailto:ar2204@cam.ac.uk))*

This course is the first of two complementary modules (with P6), which can also be taken on their own. This module will look at:

- Early embryo development
- How animals' body plans are formed
- Gene regulatory & signalling interactions
- Dynamic cell behaviours & morphogenesis

You will therefore learn about the key principles of embryonic development, taking examples from a range of early developmental events, such as cell fate determination, germline development, gastrulation, segmentation, and somitogenesis, in both invertebrate and vertebrate systems.

During the course of the module you will be introduced to a range of modern techniques applicable to the study of development including molecular, genetic and imaging technologies.

The module will compare mechanisms across a broad range of experimental organisms and processes, in order to highlight the essential principles of developmental biology.

The module works well in combination with all other PDN modules.

### **Module P9: Cell Assembly and Interactions (D)**

*(Inter-departmental module with Zoology)*

Module organiser: Dr Angeleen Fleming ([af425@cam.ac.uk](mailto:af425@cam.ac.uk))

Cells are highly organised and dynamic structures. In this module we will explore how the architecture of the cell is constructed and how cells interact with each other and their environment in order to fulfil their myriad roles in animals. Our current knowledge of these vital topics will be presented in depth, with a focus on the molecular mechanisms that regulate cell behaviour. We examine how cells use basic cell biological mechanisms in their complex activities within animals, including cellular behaviour during development and how cellular activities provide key physiological functions in the adult.

We study how cells become polarized and adhere together to form higher order multicellular assemblies, how membrane compartments are constructed, and the dynamics of transfer between them. We will discuss current ideas about how cells were created during evolution, and how eukaryotic cells arose from prokaryotes. We will explore how cells sense and respond to the mechanical properties of their surroundings and the key role of the cytoskeleton in determining cell shape, organisation and movement. Finally, we will discuss how cells maintain protein homeostasis, and the important process of autophagy in cellular physiology. Thus, we provide a comprehensive picture of different fundamental cellular processes and introduce a broad range of techniques to visualise and study these processes in live cells, in vitro and in intact animals.

This is an interdepartmental course (with Zoology). In addition to lectures there are several interactive sessions (such as journal clubs) in which there will be discussions of key papers, experimental techniques and major concepts in the field.

P9 works well with the other 'Developmental and Reproductive Biology ('D') Theme' modules (P4, P6) and also P7: Pathophysiology of Cancer (D, P)

## **Lent Term Modules**

### **Module N6: Higher Order Function and Dysfunction (N)**

*Module organiser: Prof Angela Roberts ([acr4@cam.ac.uk](mailto:acr4@cam.ac.uk))*

This module considers the neurobiological basis of a range of higher-order functions in the brain including (i) perception, recognition and decision making in the visual domain, (ii) executive functions and their relationship with intelligence and (iii) positive and negative emotions and their regulation. These are the product primarily of the functioning of high-order association cortices found in the temporal and frontal lobes. They will be discussed in relation to findings from a range of experimental approaches in humans and animals including non-human primates and rodents.

Vision is a main source of information for primates, and our life greatly depends on the ability to recognise behaviourally relevant objects. This section will consider how a visual input is analysed to detect objects including faces, and how such information can be memorised and recalled to guide our behaviour. It will consider how the physical shape of an object is analysed along the ventral visual stream to create a neuronal representation of the object independent of angle and size in viewing; how memorised objects are represented by neurons in medial temporal lobe; how these memories can be recalled through local processing as well as global interaction of brain regions and how new information can be stored in the brain as detectable changes within specific neurons.

In considering executive function, a particular focus will be placed on the important role of the prefrontal cortex and associated networks, in particular the hippocampus. The unity and diversity of executive functions and their instantiation within prefrontal cortical networks alongside the specific relationship between the hippocampus and prefrontal cortex will be discussed. This section will finish by considering the dysregulation of executive functions that occur across a range of psychiatric disorders including Schizophrenia, Depression, Obsessive Compulsive disorder and anxiety and the failure of current therapies to treat cognitive symptoms.

Finally, the circuits involved in both the regulation and dysregulation of positive and negative emotion will be described. Emphasis will be placed on the contribution the prefrontal cortex makes to the top down regulation of subcortical circuits known to induce appetitive approach and negative avoidance behaviour. Throughout this module use of state-of-the-art technology to measure and intervene in brain function will be highlighted alongside the translational potential of studies in animals to inform our understanding of higher-order functions and dysfunctions in humans.

This module works best when taken with any of the other neuroscience modules.

### **Module N9: Modulation, Plasticity, and Behaviour (N)**

*Module organiser: Dr Sue Jones ([sj251@cam.ac.uk](mailto:sj251@cam.ac.uk))*

A fascinating feature of the nervous system is neuronal plasticity: the ability for neurons and their connections to be modified in response to specific patterns of activity in an ever-changing external or internal environment. Alongside neuronal plasticity, the modulatory effects of neurochemicals provide additional flexibility in the response repertoire of neurons. In the mature mammalian brain, neuronal plasticity and modulation enables complex neural networks to remain dynamic and adaptive.

Two key questions in modern neuroscience are: what are the mechanisms of neuronal plasticity, and how do neuronal plasticity and modulation contribute to behaviour? This module will focus

on both of these questions, and will explore examples of plasticity and modulation in defined neuronal systems, ranging from endocrine modulation of hypothalamic circuits in the context of sexual maturation and behaviour, to the neuronal plasticity in sensory, motor and cognitive networks. Contemporary as well as traditional research methods for investigating neuronal plasticity and modulation will be considered, including opto- and chemogenetic approaches, imaging and electrophysiology. The first lecture will include an introduction to different forms of cellular and synaptic plasticity and modulation.

This module works best when taken with any of the other neuroscience modules.

## **Module P2: Development and Stem Cells: Embryonic and Extra-embryonic Tissues (D, P)**

*Module organisers: Dr Erica Watson ([edw23@cam.ac.uk](mailto:edw23@cam.ac.uk)) and Dr Claire Senner ([ces07@cam.ac.uk](mailto:ces07@cam.ac.uk))*

A mammalian zygote is a remarkable cell because it carries the molecular and genetic information required to form an adult organism with reproductive potential. The initial cell divisions of an embryo are crucial to lay down the framework for reproductive success since the first cell fate decisions establish the embryonic and extra-embryonic lineages. For development to continue, the free-floating embryo must implant into the uterus, a process that requires complex interactions of cells from two different individuals. As embryogenesis occurs internally in the female reproductive tract, it is a logistical and ethical challenge to study these normal developmental processes in human pregnancy and to identify when and why they go awry to cause pathologies or embryo loss.

In this module, we delve into the earliest stages of mammalian embryogenesis in the pre-, peri-, and post-implantation embryo to consider how the cell fate decisions are taken and what signalling cascades, transcriptional networks, and epigenetic modifications play a role in their establishment and maintenance. We consider how genetic mouse models can be used to study these early developmental events as well as the recent exciting advances in human stem cell models of mammalian embryogenesis that allow better access to key developmental questions at these early stages of life. These models include stem cell derivation from embryonic and extraembryonic lineages, embryoid bodies, gastruloids, stem cell-derived embryo structures, trophoblast and endometrial organoids, and the co-culturing of embryos with uterine cells to model implantation. We will ask questions such as: can researchers really grow a mammalian embryo in a dish and what can it teach us about *in vivo* development? What are the benefits and limitations of stem cell models? How is the regulation of embryogenesis altered by environmental change, such as occurs during assisted reproduction (e.g., IVF), alteration of parental diet including vitamin intake, or toxicant exposure. Should researchers consider events in germ cell development and maturation to fully appreciate the factors required for early embryogenesis?

The module will involve lectures, Q&A sessions, workshops, and journal clubs.

Useful combination modules include: P3 Fetal and placental physiology (M), P4 Early Development & Patterning: Genetic and Cellular Mechanisms (M), P6 Development: Cell differentiation and organogenesis (L).

## **Module P6: Development: Cell Differentiation and Organogenesis (D)**

*(Inter-departmental module with Zoology)*

Module organiser: Dr Emma Rawlins ([elr21@cam.ac.uk](mailto:elr21@cam.ac.uk))

This course is the second of two complementary Developmental Biology modules (with P4) that can also be taken on their own.

This module examines a second phase of embryonic development, following the initial steps of defining axes, major cell layers, and broad pattern domains (covered in P4). P6 works well with any of the other developmental and cell biology modules, particularly P2 Development and stem cells, P4 Early development and patterning, P7 Pathophysiology of Cancer and P9 Cell assembly and interactions. It can also complement P3 Fetal and placental physiology.

A series of topics will be presented, each using particular tissues or organs to highlight individual developmental mechanisms. Thus, the diverse mechanisms to make tubular organs will be used to highlight the importance of cell polarity and cell shape changes, and used as a framework for discussing key techniques in the study of developmental biology; the development of the heart will be used to discuss the transcriptional programmes that drive differentiation, and to highlight different strategies for organ morphogenesis; the importance of stem cells and cell competition in the formation and then lifelong maintenance of organs will be discussed using a variety of examples, including oesophagus and intestine; the formation of the vertebral column illuminates mechanisms of cell allocation and morphogenesis, including the role of mechanics; and limb development illustrates how patterning mechanisms are coordinated with cell proliferation.

A mixture of examples from simpler invertebrate models and vertebrates will show how developmental mechanisms have diversified with increasing cell number. We will also discuss human diseases that impact on the development of these organs, and how our understanding of organogenesis provides the foundation for regenerative medicine approaches to the treatment of these diseases.

This interdepartmental course (with Zoology) will consist of three lectures per week, and seven interactive sessions (such as journal clubs) in which we will aim to discuss key references and the concepts presented in the lectures.

## **Module P7: Pathophysiology of Cancer (D, P)**

*Module organisers: Prof Hugh Robinson ([hpcr@cam.ac.uk](mailto:hpcr@cam.ac.uk)) and Dr Maria Alcola ([mpa28@cam.ac.uk](mailto:mpa28@cam.ac.uk))*

We will examine cancer and malignant progression of solid tumours as examples of how to integrate a physiological approach to disease, giving consideration to modern genetic tools and techniques as well as to the unique physiological challenges of malignancy. We will also discuss how this impacts therapeutic choices and drug development. Consideration will be given to how research on pathophysiology is influenced by modern understandings of systems biology and physiology. The course will include lectures and interactive question and answer sessions of selected relevant articles.

The course is suited to both NST and MVST students and works well with all other modules.

## **Module P8: Systems and Clinical Physiology (P)**

*Module organiser: Prof Stewart Sage ([sos10@cam.ac.uk](mailto:sos10@cam.ac.uk))*

Systems physiology is central to the practice of scientific medicine. This module gives students a more detailed view of some aspects of systems physiology and includes some clinically oriented material that is of particular importance to the practising doctor. Cardiovascular topics include cardiac arrhythmias and the genetics and energetics of heart failure. Renal physiology covers autoregulation of renal blood flow and glomerular filtration rate, acute kidney injury and chronic renal failure. Several areas of endocrine physiology are explored in the form of pancreatic islet and gut hormones, brain control of food intake, the pathophysiology of obesity and the physiology and pathophysiology of bone.

The lecturers giving this course are from the Department of Medicine and the Institute of Metabolic Science as well as PDN.

This module is reasonably self-contained and can be taken in combination with any other modules. There is a small amount of overlap with some of the material covered in other P modules, including P1N4, P3 and P7, but it is not necessary to take any of these modules in order to understand the material in P8.

## **PDN MODULE FOR BBS STUDENTS ONLY**

### **Minor 137: Surgical and Radiological Anatomy**

*Maximum of 30 students*

*Organiser: Prof Cecilia Brassett ([part2@pdn.cam.ac.uk](mailto:part2@pdn.cam.ac.uk))*

This course introduces students to areas of anatomy that are especially relevant to surgical and radiological procedures. The need for a good working knowledge of anatomy in surgical and radiological practice is of course paramount in clinical safety. Applicants for Core Surgical Training and Specialty Radiology Training may improve their scores in the “Experience in and commitment to specialty” component by having chosen to take a relevant module such as this course. Students also choose one practical activity from the following options: attendance at operating theatre sessions; diagnostic and/or interventional radiology session; or preparation of an anatomical prosection (for Natural Sciences students, as they cannot undertake clinical placements). Assessment includes a 1-hour Short Answer Questions paper, a short written report and oral presentation on the practical session. Lecturers are current consultant radiologists and surgeons. Veterinary students are very welcome, as the lectures are still relevant, and they can obtain placements at the Vet School.

Further details can be found in the Surgical and Radiological Anatomy Subject Fair Moodle page <https://www.vle.cam.ac.uk/course/section.php?id=3475172>

Course Booklet: <https://www.biology.cam.ac.uk/sites/default/files/SaRA%20Booklet%2026-27%20%28updated%2011.02.26%29.pdf>

## RECENT RESEARCH PROJECTS: Some topics of recent PDN dissertations

<b>Two-term Experimental Projects 2025-26</b>	
<b>Supervisor</b>	<b>Experimental Project Title</b>
Maria Alcolea, Shay Melamed	3D explant-derived cultures (epithelioids) to study the effect of extracellular matrix proteins on epithelial cells
Clare Baker, Martin Minarik	The development of electrosensory lateral line organs in teleost fishes: insights into the evolution of novel cell types
Sumru Bayin	Investigating the Role of Growth Factor Signalling on Cerebellar Nestin-expressing Progenitor Differentiation
David Belin, Mickael Puaud	Comfort eating as a gateway to Semaglutide resistant obesity
Clemence Blouet, Anthony Tsang	Role of extracellular matrix remodelling in hindbrain feeding neural circuits
Thorsten Boroviak, Maria Ubach	Delineating human and non-human primate implantation strategies
Cecilia Brassett, Mr Peter Domos, Mr Niel Kang, Miss Salma Chaudhury	Evaluating the effect of a novel technology in two common surgical settings upon the accuracy of 1) screw placement in the Latarjet stabilisation procedure and 2) humeral head resection during shoulder arthroplasty
Cecilia Brassett, Mr Peter Domos, Mr Niel Kang, Miss Salma Chaudhury	Evaluating the effect of a novel technology upon the accuracy of humeral head resection during shoulder arthroplasty
Cecilia Brassett, Dr Andrew Grainger	The relationship between the attachments of gluteus medius, gluteus minimus and vastus lateralis in the Greater Trochanteric Pain Syndrome
Albert Cardona-Torrens, Yijie Yin	Mapping neurotransmitters onto electron microscopy-reconstructed connectomes
Albert Cardona-Torrens, Michael Clayton	Neural signatures of locomotion in the Drosophila larval brain
Tereza Cindrova-Davies	The impact of inflammatory cytokines on hormone-driven endometrial epithelial cycling
Hannah Clarke, Miriam Gwilt	Alterations in the marmoset dorsolateral prefrontal cortex perineuronal net (PNN)-wrapped pyramidal cells after hippocampus PNN degradation
James Fraser	Computer modelling of the skeletal muscle "excitability window"
James Fraser	Nerve conduction velocity supernormality
Elisa Galliano, Harin Wijayathunga	Olfactory enrichment and neuronal plasticity in the mouse olfactory bulb
Dino Giussani, Youguo Niu	Tadalafil therapy for fetal cardiovascular dysfunction: Studies in the chicken embryo
Geula Hanin	Investigating the role of imprinted gene Grb10 on mammary gland development
Geula Hanin	Exploring Imprinted Gene Products in Human Breastmilk and Their Role in Infant Development
Courtney Hanna, Emma Siragher, Julie Tang	Investigating the role for histone methyltransferase MLL2 in embryogenesis
Allan Herbison, Szilvia Vas	The relationship between arcuate kisspeptin neuron activity and the sleep-wake cycle in male mice
Omar Mahroo	Investigating human retinal function in vivo using the electroretinogram
Omar Mahroo	Investigating human retinal function in vivo using the electroretinogram
Matthew Mason	Comparative Morphology of the Hyoid Apparatus

Hugh Matthews	Modulation of the stretch reflex in string musicians
Hugh Matthews	Modulation of the stretch reflex in athletes
Hugh Matthews, Chris Huang	Effects of modified cellular Ca <sup>2+</sup> homeostasis on Na <sup>+</sup> current activation in mouse skeletal muscle
Hugh Matthews, Chris Huang	PKC modulation of Nav1.4 in murine skeletal muscle
Ewa Paluch, Marta Urbanska	Exploring the molecular mechanisms of tissue (un)jamming in gastruloids
Jasper Poort	Visual cortical activity during visual detection and discrimination.
Eleanor Raffan	A genome-wide association study of food motivation in Labrador retrievers
Seyed Rasooli-Nejad, Sue Jones, Bill Colledge	Electrophysiological Characterisation of NMDA receptors in the Kisspeptin neurons of the Hypothalamus
Thomas Rawlings	Investigating the Origins of Endometrial Dyshomeostasis in Recurrent Miscarriage
Emma Rawlins, Mien Chew	How does hypoxia influence alveolar epithelial behaviour and differentiation in the developing human lung?
Hugh Robinson, Jodie Collingridge	Modelling voltage-gated sodium current and membrane potential signalling in triple-negative breast cancer cells
Alberto Rosello-Diez, Emma Steijvers	Investigating limb size determination using interspecies chimeric and AI staging models
Stephen Sawiak, Angela Roberts	Neuroimaging the social brain across development in a non-human primate
Claire Senner	Investigating the Role of Nonsense Mediated Decay in the Trophoblast Lineage
Amanda Sferruzzi-Perri, Geula Hanin, Natasha Cavell	Placenta-mammary gland axis and imprinted genes
Amanda Sferruzzi-Perri, Ashley Zubkowski	The effect of NMN on maternal metabolic parameters in normal mouse litters and those that overexpress Igf2
Amanda Sferruzzi-Perri, Ashley Zubkowski	The effect of NMN on conceptus development in normal mouse litters and those that overexpress Igf2'
Mekayla Storer, Camille Dumas, Joseph Wong	Understanding the finite nature of mammalian digit tip regeneration
Keita Tamura	Real time gaze-estimation of freely-moving marmosets
Keita Tamura	Establishing systems neuroscience approaches in freely behaving marmosets
Erica Watson, Bill Colledge	Exploring effects of abnormal folate metabolism on eye development and structure
Erica Watson	Development and function of glycogen trophoblast cells in mouse placenta
Fengzhu Xiong, Lakshmi Balasubramaniam	Biomechanics of vasculogenesis during early development

<b>Two-term Theory Projects 2025-2026</b>	
<b>Supervisor</b>	<b>Theory Project Title</b>
David Bainbridge	Is there sufficient evidence to determine whether placental Hofbauer cells respond effectively to bacterial infection, and is their response compromised by their role in fetomaternal tolerance?
Riccardo Beltramo,	How does the brain represent the spatial location of others?
Sepiedeh Keshavarzi, Célia Laurent	A systematic review of behavioural tests for rodent navigation: distinguishing path integration and landmark use
David Parker	An analysis of causality in nervous system models
Wolfram Schultz	Why is reward processed in many regions of the brain?

<b>BBS Dissertations 2025-2026</b>	
<b>Supervisor</b>	<b>Dissertation Title</b>
David Bainbridge	To what extent are the biological effects of menopause reversible?
David Bainbridge	How is neural control of fine motor function in the hand reorganised after stroke? What is the application of this to therapy and rehabilitation strategies?
Clare Baker	The role of non-neuronal cells in somatosensation
David Belin	The Noradrenergic Basis of Compulsive Behaviour
David Belin	Comfort eating as a gateway to Semaglutide resistant obesity
Nick Brown	Mechanotransduction in osteoarthritis: integrating mechanical loading and regenerative signalling
Nick Brown	The role of mechanotransduction in tissue remodeling during adult life
Andrea Dimitracopoulos	How can artificial neural networks help us understand and interface with the human brain?
Angeleen Fleming	Is UPS-type I mediated tau secretion protective or pathological in tauopathies?
Alison Forhead	Developmental programming in the livestock industry
Alison Forhead	Developmental programming in race horse performance and athletic capacity
Alison Forhead	Prenatal Androgen Exposure and Ovarian Function in Female Offspring
Alison Forhead	The male disadvantage? Sex differences in neonatal mortality and morbidity
Dino Giussani	Interventional Strategies for Developmental Origins of Disease
Allan Herbison	Characterising the Monkey Kisspeptin Neuron Pulse Generator Controlling Fertility: A Comparative Analysis of Monkey MUA and Mouse Neuronal Activity
Sepiedeh Keshavarzi	The Neural Basis of the Sense of Direction
David Parker	AI, brain emulation, and the technological singularity.
David Parker	Regeneration and recovery from spinal cord injury.
Ali Rasooli-Nejad	Voltage gated sodium channels as therapeutic targets for chronic pain
Hugh Robinson	Necrosis in Cancer; The impact of the Tumour Microenvironment on Tumour Development and Antitumour Immunity.
Stewart Sage	The Impact of SARS-CoV-2 on the Cardiovascular System: Mechanisms of Coagulopathy and Current Therapeutic Strategies
Stewart Sage	Exploring the relationship between SARS-COV-2 infection and coronary vessel occlusion: mechanisms and clinical manifestations
Milka Sarris	Exploring the mechanisms and strategies in manipulating immune cell trafficking in cancer immunotherapy
Christof Schwiening	Is maximal endurance performance determined by sympathetic reserve?
Amanda Sferruzzi-Perri	Artificial Placenta Technologies: Which hurdles need to be overcome before human trials?
Mekayla Storer	Regeneration: The cause or cure for cancer?

## RECENT PUBLICATIONS RESULTING FROM PART II RESEARCH PROJECTS

Recent published papers resulting from, or including work from, Part II projects (with student's name in bold):

**Amedor G.** and Giussani, D.A. (2026). Physiological mechanisms mediating socio-environmental influences on pregnancy outcomes in black people. *Trend in Endocrinology & Medicine*. In Press.

**Barrell AM,** Sferruzzi-Perri AN. The Impact of Preeclampsia and Gestational Diabetes on Future Maternal Cardiometabolic Health. *Acta Physiol (Oxf)*. 2025 Nov;241(11):e70113. doi: 10.1111/apha.70113

**Brown ER,** Giussani DA. Cause of fetal growth restriction during high-altitude pregnancy. *iScience*. 2024 Apr 8;27(5):109702. doi: 10.1016/j.isci.2024.109702. PMID: 38694168; PMCID: PMC11061758.

**Burford, C.M.,** Cornwall, H.L., **Farr, M.R.B., Santoni, C.M.,** Mason, M.J. (2023) Development and anatomy of the human middle ear. In: Goycoolea, M.V., Selaimen da Costa, S., de Souza, C., Paparella, M.M. (eds) *Textbook of Otitis Media*, pp.29-48. Springer, Cham.

Campbell, A.S., Minařík, M., Buckley, D., **Anand, T.,** Gela, D., Pšenička, M., Baker, C.V.H. (2026) Molecular insights into electroreceptor ribbon synapses from differential gene expression in sturgeon lateral line organs. *Journal of Anatomy*, in press. DOI: <https://doi.org/10.1111/joa.70061>

Candia AA, Lean SC, Zhang CXW, McKeating DR, **Cochrane A,** Gulacsi E, Herrera EA, Krause BJ, Sferruzzi-Perri AN. Obesogenic Diet in Mice Leads to Inflammation and Oxidative Stress in the Mother in Association with Sex-Specific Changes in Fetal Development, Inflammatory Markers and Placental Transcriptome. *Antioxidants (Basel)*. 2024 Mar 28;13(4):411. doi: 10.3390/antiox13040411

**Duru DO,** Chaudhury S, Kang N, Brassett C. Scapular Morphometry Informs Suprascapular Nerve Injury Risk During Reverse Shoulder Arthroplasty: A Cadaveric Study. *J Clin Med*. 2026. Accepted. In press.

**Duru DO, Lee DKR,** Jarvis GE, Kang N, Chaudhury S, Brassett C (2025). A novel patient-specific landmark-guided approach for intramuscular botulinum neurotoxin injections into the rotator cuff: A cadaveric study. *Clinical Anatomy*, 2025 Dec (online ahead of print) <https://doi.org/10.1002/ca.70068>

**Duru DO, Lee DKR,** Kang N, Chaudhury S, Brassett C (2026). Scapular morphometrics inform anatomic landmark distances for arthroscopic suprascapular nerve decompression: A cadaveric study. *Journal of Shoulder and Elbow Surgery International*. 2026. <https://doi.org/10.1016/j.jseint.2026.101647>

**Eddlestone T,** Morris PG & Herbison AE (2026) GABA receptor modulation of arcuate kisspeptin neuron bursting and synchronization activity in female mice. *J Neuroendocrinol* 2026 (in press)

**Garrud TAC,** Teulings NEWD, Niu Y, **Skeffington KL,** Beck C, Itani N, **Conlon FG,** Botting KJ, Nicholas LM, Tong W, Derks JB, Ozanne SE, Giussani DA (2023). Molecular mechanisms underlying adverse effects of dexamethasone and betamethasone in the developing cardiovascular system. *FASEB J*. 37(6): e22887. doi: 10.1096/fj.202200676RR.

**Griffiths, B., Thirunavukarasu, A.,** Jarvis, G., Brassett, C. & Sarkies, N. (2023) Novel investigation of the dimensions of the optic canal using 3D reconstructions from micro-CT scans. *Clinical Anatomy*, DOI 10.1002/ca.24044.

**Guo, Y.,** Sparks, J., Brown, J. & Brassett, C. (2023) Novel factors affecting barrier function at the oesophagogastric junction. *Clinical Anatomy*, DOI: 10.1002/ca.24131.

Hilton JR, **Simpson SR,** Sherman ER, Raby-Smith W, Azvine K, **Arribas M, Zou J,** Deiana S, Hengerer B, Cahill EN (2023) Reactivity to conditioned threat cues is distinct from exploratory drive in the elevated plus-maze. *European Journal of Neuroscience*. doi: <https://doi.org/10.1101/2022.03.21.485161>

**Hutchinson, L.,** Lambert, S., Brassett, C. & Grainger, A. (2023). Developing a novel ultrasound protocol to measure movement of the subscapularis tendon in shoulder abduction. *Clinical Anatomy*, DOI: 10.1002/ca.24131.

**Hutchinson, L., Omer, T.,** Pizzimenti, M., Grainger, A., Brassett, C. & Lambert, S. (2023) Cadaveric study investigating variation in the nerve supply of subscapularis in relation to its morphology. *Clinical Anatomy*, DOI

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**Kane AD**, Herrera EA, Niu Y, Camm EJ, Allison BJ, Tijsseling D, Lusby C, Derks JB, **Brain KL**, Bronckers IM, Cross CM, Berends L, Giussani DA (2023). Combined Statin and Glucocorticoid Therapy for the Safer Treatment of Preterm Birth. *Hypertension* 80(4):837-851.

**Lakshmi, A.**, Grainger, A., Brassett, C. & Lyall, H. (2023) Anatomical variations in extensor tendons of the thumb: a study using cadaveric dissection and ultrasound scanning. *Clinical Anatomy*, DOI 10.1002/ca.24044.

Lea G, Doria-Borrell P, Ferrero-Micó A, **Varma A**, Simon C, Anderson H, Biggins L, De Clercq K, Andrews S, Niakan KK, Gahurova L, McGovern N, Pérez-García V, Hanna CW. (2025) Ectopic expression of DNMT3L in human trophoblast stem cells restores features of the placental methylome. *Cell Stem Cell*; 32(2):276-292.

**Leavy, A., Salahudin, D.**, Dowell, J. & Brassett, C. (2023) What factors might be useful in predicting the degree of overlap of latissimus dorsi on the inferior scapula? *Clinical Anatomy*, DOI: 10.1002/ca.24131.

**Li, Z-K**, Jarvis, GE, Nava T, Li, Z-H., **Maxwell, L.**, Brassett, C, Potten, S, Norrish, A, & Pasapula, C. (2026) Anterior talofibular ligament laxity restricts deep deltoid ligament strain in a cadaveric model of acquired planus 'The deep deltoid paradoxical intact sign'. *Clinical Biomechanics*, Feb 26, 132, 106734. <https://doi.org/10.1016/j.clinbiomech.2025.106734>

Lopez-Tello J., Yong H.E.J., Sandovici, I., Dowsett G.K.C., Christoforou, E.R., Salazar-Petres, E., **Boyland, R.**, Napso, T., Yeo, G.S H., Lam B.Y.H., Constancia, M., Sferruzzi-Perri, A.N. (2023) Fetal manipulation of maternal metabolism is a critical function of the imprinted Igf2 gene. *Cell Metab.* 2023 Jul 11;35(7):1195-1208.e6. doi: 10.1016/j.cmet.2023.06.007

**Margetts M, Rufus-Toye R**, Jiang X, Leo SM, Chow I, Indusegaran M, Hysi PG, Webster AR, Hammond CJ, Mahroo OA. Selective Impairment of Rod-Driven Vision in Vitamin A Deficiency: Insights From Examining the Effect of Desensitizing Backgrounds. *Invest Ophthalmol Vis Sci.* 2025 Sep 2;66(12):30. doi: 10.1167/iovs.66.12.30. PMID: 40938071; PMCID: PMC12439512.

Mason, M.J. & **Lewis, M.A.** (2024) Structure and scaling of the middle ear in domestic dog breeds. *Journal of Anatomy* 245: 324-338.

**Maxwell, L.**, Nava, T., Norrish, A., Pizzimenti, M., Brassett, C. & Pasapula, C. (2023) Locking vs. non-locking plate fixation in comminuted talar neck fractures: A biomechanical comparison using cadaveric specimens. *Clinical Anatomy*, DOI 10.1002/ca.24044.

Minařík, M., Modrell, M.S., Gillis, J.A., Campbell, A.S., **Fuller, I.**, Lyne, R., Micklem, G., Gela, D., Pšenička, M., Baker, C.V.H. (2024) Identification of multiple transcription factor genes potentially involved in the development of electrosensory versus mechanosensory lateral line organs. *Frontiers in Cell and Developmental Biology* 12, 1327924. DOI: 10.3389/fcell.2024.1327924

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**Morris, J. A., Bardsley, O. J.**, Salvage, S. C., Jackson, A. P., Matthews, H. R., & Huang, C. L.-H. (2023). Nernst-Planck-Gaussian modelling of electrodiffusional recovery from ephaptic excitation between mammalian cardiomyocytes. *Frontiers in Physiology*, section Cardiac Electrophysiology. 14:1280151. doi: 10.3389/fphys.2023.1280151, Manuscript ID: 1280151.

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**Nayak, S.**, Dowell, J., Grainger, A., Jarvis, G., Ashwood, N. & Brassett, C. (2024). Morphological variation of Lister's tubercle and its association with the extensor pollicis longus tendon. *Clinical Anatomy*, in press.

**Parkin, RA.**, Murray, AJ., The therapeutic potential of irisin to mitigate the risk of metabolic syndrome in postmenopausal women. (2024) *Front Reprod Health*, 6:1355922

**Salahudin, D., Leavy, A.,** Dowell, J. & Brassett, C. (2023) How much variation exists in the size and morphology of the thoracolumbar fascia? *Clinical Anatomy*, DOI: 10.1002/ca.24131.

**Sinha, A., Thirunavukarasu, A.J., Bonshahi, A. & Brassett, C.** (2025) Impact of anatomical research projects for medical students: A cross-sectional survey of academic and professional skills, clinical aspirations and appreciation of anatomy. *Clinical Anatomy*, DOI: 10.1002/ca.24259. Online ahead of print.

Sowton AP., Holzner, LMW., Krause, FN., **Baxter, R.,** Mocchiari, G., Kryzyzanska, DK., Minnion, M., O'Brien, KA., Harrop, MC., Darwin, PM., Thackray, BD., Vacca, M., Feelisch, M., Griffin, JL., Murray, AJ.. (2025) Chronic inorganic nitrate supplementation does not improve metabolic health and worsens disease progression in mice with diet-induced obesity. *Am J Physiol Endocrinol Metab*, 328:E69-E91

**Talks, C,** Brady, R, Jarvis, G, Brassett, C, Vivian, A, & Somner, J (2024) Investigation of anatomical variation in the superior oblique tendon and its clinical significance. *Clinical Anatomy* (online abstract). <https://onlinelibrary.wiley.com/pb-assets/assets/10982353/Keele-Abstracts-for-publication-1723060831050.pdf>

**Tandon, A.,** Brassett, C. & Wong, K.Y. (2023) Investigating the lumbar artery perforator flap using cadaveric dissection and Doppler ultrasound assessment: An alternative flap for autologous breast reconstruction. *Clinical Anatomy*, DOI 10.1002/ca.24044.

**Tong W,** Ganguly E, Villalobos-Labra R, Quon A, Spaans F, Giussani DA, Davidge ST (2023). Sex-Specific Differences in the Placental Unfolded Protein Response in a Rodent Model of Gestational Hypoxia. *Reprod Sci.* 30(6):1994-1997.

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Zhang Y, Pakulat LM, Takács S, **Campbell L,** Galliano E, Hrabovszky E, Colledge WH, & Jones S (2025), Neuronal plasticity at puberty in mouse hypothalamic Kiss1 neurons that control fertility, *Proc. Natl. Acad. Sci. U.S.A.* 122 (43) e2512855122, <https://doi.org/10.1073/pnas.2512855122>.

**Young R,** Lewandowska D, Long E, Wooding FBP, De Blasio MJ, Davies KL, Camm EJ, Sangild PT, Fowden AL & Forhead AJ (2023) Hypothyroidism impairs development of the gastrointestinal tract in the ovine fetus. *Frontiers in Physiology* 14: 1124938. doi: 10.3389/fphys.2023.1124938.

## PROVISIONAL PART II PDN TIMETABLE 2026/27

MICH	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>
9-10	<b>P1N4</b> Cell Signalling	<b>N2</b> Experimental Tools presentation (9-11)	<b>P1N4</b> Cell Signalling	<b>N1</b> Developmental Neurobiology	<b>P1N4</b> Cell Signalling
10-11	<b>N1</b> Developmental Neurobiology	<b>N2</b> Experimental Tools presentation (9-11)	<b>N3</b> Circuits and Systems	<b>P3</b> Fetal & Placental Physiology	<b>N1</b> Developmental Neurobiology
11-12	<b>P4</b> Early Development and Patterning	<b>N3</b> Circuits and Systems	<b>P4</b> Early Development and Patterning	<b>N3</b> Circuits and Systems	<b>P4</b> Early Development and Patterning
12-1	<b>Common Courses</b> – Skills sessions	<b>P3</b> Fetal & Placental Physiology	<b>Common Courses</b> – Skills sessions & Statistics lectures	<b>N2</b> Experimental Tools (preparation)	<b>P3</b> Fetal & Placental Physiology
1-2					
2-3	<b>N3</b> Circuits and Systems (2-4 optional)	<b>P4</b> Early Dev. and Patterning (2-4 optional)	<b>N2</b> Experimental Tools (lecture)	<b>N1</b> Developmental Neurobiology (2-3 optional)	<b>P1N4</b> Cell Signalling (2-4 optional)
3-4	<b>N3</b> Circuits and Systems (2-4 optional)	<b>P4</b> Early Dev and Patterning (2-4 optional)		<b>P9</b> Journal Club (3-5 optional)	<b>P1N4</b> Cell Signalling (2-4 optional)
4-5	<b>P9</b> Cell Assembly & Interactions		<b>P9</b> Cell Assembly & Interactions	<b>P9</b> Journal Club (3-5 optional)	<b>P9</b> Cell Assembly & Interactions

LENT	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>
9-10		<b>N9</b> Modulation, Plasticity & Behaviour			<b>N9</b> Modulation, Plasticity & Behaviour
10-11	<b>P7</b> Cancer Pathophysiology	<b>P7</b> Cancer Pathophysiology	<b>N9</b> Modulation, Plasticity & Behaviour	<b>N6</b> Higher Order Brain Function and Dysfunction	<b>P7</b> Cancer Pathophysiology
11-12	<b>P8</b> Systems Physiology	<b>N6</b> Higher Order Brain Function and Dysfunction	<b>P8</b> Systems Physiology	<b>P2</b> Development & Stem Cells	<b>P8</b> Systems Physiology
12-1	<b>Common Courses</b> – Skills sessions & Stats workshops	<b>P2</b> Development & Stem Cells	<b>P2</b> Development & Stem Cells	<b>P2</b> Development & Stem Cells (optional)	<b>N6</b> Higher Order Brain Function and Dysfunction
1-2					
2-3	<b>P6</b> Dev: Cell Differentiation & Organogenesis	<b>P6</b> Journal Club (2-4 optional)	<b>P6</b> Dev: Cell Differentiation & Organogenesis	<b>P7</b> Cancer Pathophysiology (optional)	<b>P6</b> Dev: Cell Differentiation & Organogenesis
3-4		<b>P6</b> Journal Club (2-4 optional)			
4-5					

Students wishing to take PDN-based courses **MUST** submit **BOTH** a PDN Application Form via <https://www.pdn.cam.ac.uk/undergraduate/part-ii-courses> **AND** the formal NST form.



Department of Physiology, Development and Neuroscience

Downing Street

Cambridge, CB2 3EG

<http://www.pdn.cam.ac.uk/>