

## Course Information Sheet for entry in 2025-26: DPhil in Paediatrics



### Course facts

Mode of study	Full Time Only
Expected length	3 to 4 years

### About the course

The DPhil in Paediatrics provides opportunities for study in a broad range of basic, translational and clinical science related to child health including major strengths in developmental immunology and haematology, infectious disease, vaccines, paediatric imaging and neuromuscular biology, mucosal immunology and gastroenterology. You will become part of a vibrant research community both within the department and in the wider University.

You will develop generic research skills by making use of a range of research training and skills development offered by the medical sciences division, alongside direction by your supervisor in specific research methods in relation to your project. You are encouraged to develop a literature review in your first year and to attend courses in manuscript and thesis writing and in presentation skills. At the heart of the skills provision are regular group meetings and the annual departmental Research Day where you will present and develop your research ideas and proposals with the benefit of feedback and support from your peers.

**Expand each supervisor's name below to read more about the research themes and areas.**

#### **Sarah Atkinson**

Infectious diseases are a leading cause of hospitalisation and death among young children living in resource-poor communities in sub-Saharan Africa. In the same communities, micronutrient deficiencies (MDs) are highly prevalent. Particularly concerning is that micronutrient deficiencies are estimated to cause 745,000 deaths annually and have been associated with a range of life-threatening infections. The intersection between widespread MDs and infectious disease risk is a substantial opportunity for public health policy. However, causal links between MDs and life-threatening infections are difficult to establish since observational studies may be biased by unmeasured confounders, such as socioeconomic status, or reverse causality since infection itself alters micronutrient status. Several randomised controlled trials (RCT) evidence impacts of certain micronutrient supplements on a range of infections, but findings are inconsistent. Moreover, many RCTs have focused on mild disease, had variable duration, dosage, or timing of supplementation, and biological mechanisms are largely unknown. Extremely large RCTs required for studying rare outcomes are often not feasible or scalable. The PhD candidate will conduct genome wide-association studies in 3,000 children from around Kilifi and in stored samples from across Africa to identify genetic variants that alter blood levels of micronutrients in young children living in Africa. The PhD will then assess the causal impact of specific micronutrient deficiencies on severe infections in young children using Mendelian randomization analyses in very large datasets from children with severe malaria, bacteraemia, TB, and a range of other life-threatening infections. Further work will include recall by genotype studies to elucidate putative biological mechanisms underlying causal associations between specific micronutrient deficiencies and specific severe infections.

The successful candidate will be expected to contribute to the planning and set up of a study of 3000 infants in Kilifi County, Kenya. The study will collect child health, and blood samples for biomarkers of micronutrients and genetic studies. GWAS studies will be used to identify genetic variants associated with these micronutrient levels in young children. Based on literature review and genetic variants identified from GWAS studies, the candidate will subsequently apply a Mendelian Randomization approach to investigate the causal effects of specific micronutrients on severe life-threatening infections in young children.

#### **Rinn Song/Else Bijker**

##### **Novel Diagnostics for Paediatric Tuberculosis**

Tuberculosis (TB) remains a significant cause of morbidity and mortality in children, particularly in low- and middle-income countries, with an estimated incidence of one million cases per year. Diagnosis of TB is complex, especially in young children, because their symptoms are non-specific, they cannot expectorate sputum and often have paucibacillary disease. Despite significant advances in TB diagnostics made in the last decade, they barely impacted on paediatric TB. As a result, under-diagnosis of those with TB is common. Improving paediatric TB diagnosis is very important, not only for individual patients, but also for the assessment of the true burden of paediatric TB and the development of new treatments and vaccines which is hindered by the lack of a reliable reference standard.

New approaches for diagnosis of paediatric TB are urgently needed, especially in three areas that the group is working on:

1. tests that can be used at the point of care level;
2. non-sputum-based tests; and
3. tests that can accurately identify the children with TB currently classified as microbiologically negative.

The group works together in a strong consortium of world-leading scientists and collaborators from around the world, including Uganda, Peru, the United States of America, Switzerland and Canada: the Feasibility of Novel Diagnostics for TB in Endemic Countries (FEND for TB) Consortium, funded by the U.S. National Institutes of Health for five years. The previous NIH-funded consortium led to the development of the GeneXpert Assay. The objective of the FEND for TB Consortium is to support the evaluation of early-stage tuberculosis diagnostic assays and strategies in the context of existing clinical algorithms in tuberculosis endemic countries. FEND for TB conducts early-stage diagnostic accuracy and feasibility studies and then feeds back to assay developers to facilitate the efficiency of the iterative assay evaluation-assay revision process. The consortium also involves a group of highly-recognised experts in modelling to evaluate impact, cost-effectiveness and other key factors to consider for the possible implementation of promising novel TB tests.

This project would offer a variety of exciting opportunities, including in-country study implementation and supervision, biostatistical and analytical work, modelling research, and through close collaboration with the Foundation for Innovative New Diagnostics (FIND) insight and contributions to the process of working with the WHO in their regulatory approval process of new diagnostic tests for TB. For further information, please see the grant information for FEND for TB and the grant information for Novel and Optimized Diagnostics for Pediatric TB (both external links).

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## Michelle Fernandes

F1000: The “whole child” approach to promote and rescue early brain growth, health and development during the first 1000 days of life.

The first 1000 (F1000) days of life, from conception to age 2, are foundational to brain development. During this period, the developing brain is highly sensitive to environmental influences, both positive and adverse, with multi-system and enduring effects through the lifecourse. Approximately one in five children under five globally are at risk of developmental delay. Owing to a lack of screening resources, many do not receive the interventions they require within this golden window of brain development because they are only identified at school age or later.

The F1000 group's work is focussed on developing novel “whole child” strategies to promote and rescue early child development during the F1000 days of life. Our work involves the pillars of early identification, intervention and impact, towards making a positive difference to the most vulnerable children, internationally, at risk of developmental delay. The research of this group seeks to (i) detail mechanistic understanding of the pathways underpinning typical and atypical early child development globally; (ii) construct & disseminate novel and scalable tools to rapidly and sensitively identify infants and young children with developmental delay at key points of contact with healthcare services and (iii) develop and validate novel whole-child interventions to promote brain development among young children internationally by leveraging as much of the F1000 day window as possible. The group combines neuroscience, epidemiological, data science and global maternal and child health approaches and has longstanding collaborations with 26 institutions across 23 countries in the UK, Europe, South East Asia, the Middle East, Sub

Saharan Africa, and North, Central and South America. The group has pioneered the construction of three novel early child development assessments and the first international standards of early child development. An important theme that is integrated in all aspects of the group's work is promoting community and stakeholder engagement at local and regional level to build and sustain capacity in the "whole child" approach to early brain growth, health and development during the F1000 days.

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### **Daniela Ferreira**

Despite available vaccines, pneumonia is still a major killer affecting particularly vulnerable populations, such as children and the elderly. Pneumococcal infections are most common in the winter with secondary pneumococcal pneumonia being the major cause of mortality following seasonal and pandemic influenza infection. Our group uses Human Infection Challenge models in which participants are deliberately infected with live respiratory viruses and bacteria to study host-pathogen interactions, immune responses, pathogen transmission and to accelerate development of vaccines. Our group offers exciting DPhil projects in the following areas:

- Host and pathogen gene expression associate with pneumococcal shedding
- Systemic and mucosal correlates of protection to respiratory infection and vaccination
- Susceptibility to respiratory disease: chronic inflammation, comorbidities and immuneaging
- Interaction of viral and bacterial co-infections and immune response modulation
- Use of nanoparticle platforms to develop treatments for virus and bacterial respiratory infections
- Computational biology and machine learning

Each project can be tailored to give the student exposure to their methods of interest including B and T cell ELISPOTs, ELISAs, Luminex, multicolour flow cytometry and cell sorting, transcriptomic analysis at population and single cell level, and extensive data analysis (including R) and computational biology (machine learning).

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### **Philip Goulder**

It is becoming increasingly clear that immune sex differences have a substantial impact on outcome from infectious disease and vaccines. The group's own studies of children who became infected with HIV in utero show that these immune sex differences start before birth and have substantial impact before birth. Female fetuses born to mothers who themselves become infected with HIV during pregnancy are 2-3x more susceptible to infection than male fetuses. The reason, the group believes, is that the female fetus shares with her mother a strong dependence on the innate immune response, and specifically type I interferon (IFN-I) production in response to viruses such as HIV, to protect against infection. Thus, the virus that evades this defence in the mother is highly IFN-I-resistant, and this same highly IFN-I-resistant virus evades the same innate response in the female fetus, but not male fetuses, who are more susceptible to IFN-I-sensitive viruses with high replicative capacity (Adland et al Nature Communications, 2020).

The Goulder Group Research theme focuses on two related goals: the first being to define the mechanisms and impact of immune sex differences in early life; and the second being to define the immune responses in early life that maximise the potential for achieve cure in HIV-infected children. HIV provides an ideal tool to help understand the immune sex differences that are present in early life and their impact. A cohort of 250 HIV-infected mother child pairs in KwaZulu-Natal, South Africa, followed from the infant's birth, form the focus of much of this work in the Peter Medawar Building in Oxford. The exposure of sex-discordant twins to other infections (CMV) and to vaccines provide an additional unique means of evaluating early-life immune sex differences. This group's work is focused on the South African HIV epidemic. Although the group is based in Oxford, they have over the past 20 years developed strong collaborations in Durban and Kimberley, South Africa.

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### **Caroline Hartley**

One in 13 babies are born prematurely; understanding and mitigating the long-term impact of premature birth is important to improve the lives of these children. Apnoea - the cessation of breathing - is a common pathology associated with prematurity. These potentially life-threatening

events can result in reduced cerebral oxygenation and frequent apnoeas have been associated with long-term effects including reduced childhood cognitive ability. The focus of the research group is to understand the interaction between apnoea and brain development in premature infants, and to investigate how physiology is altered by pharmacological and non-pharmacological interventions. The group is part of a multidisciplinary team of clinicians, nurses, mathematicians, engineers and scientists. The group's work focuses on the collection and use of EEG (electroencephalography) and vital signs (heart rate, respiratory rate etc) data, and the group develops signal processing techniques and uses machine learning to derive tools with the aim to ultimately improve outcomes for prematurely-born children.

Caroline develops approaches to analyse infant brain activity and physiological data, such as heart rate and oxygen saturation, to address clinically relevant questions in the field of neonatal neuroscience. Caroline's research focuses on understanding the impact of apnoea on premature infant brain development, and providing measures to improve the assessment and treatment of pain in infants.

Apnoea - the cessation of breathing - is a common pathology associated with prematurity. These potentially life-threatening events can result in reduced cerebral oxygenation and frequent episodes of apnoea have been associated with long-term effects including reduced childhood cognitive ability. 1 in every 10 babies are born prematurely; understanding and mitigating the long-term impact of premature birth is important to improve the lives of these children.

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## Georg Hollander

The thymus is the anatomical site where T cells are generated and instructed to provide protective immunity against pathogens whilst ignoring the individual's own tissues. Thymic epithelial cells (TEC), an essential component of the organ's 3-dimensional scaffold, attract T cell precursor from the peripheral blood, foster their differentiation in a bespoke micro-environment, and help to select developing T cells based on their antigen specificities. Based on their distinct structural, phenotypic, and transcriptomic features, TEC are differentiated into distinct subtypes. Defects in TEC differentiation and function are incompatible with a normal generation of naive T cells and therefore frequently associated with severe combined immunodeficiencies or a loss of immunological tolerance. The research of the laboratory seeks to detail the genetic and epigenetic control of TEC development and function combining multi-parameter flow cytometry, advanced histological and molecular methods, proteomics, mathematical modelling and transcriptomic analyses at both population level and single cell resolution.

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## Young Chan Kim

### Novel Vaccine Development and Diagnostic Tools for Emerging Infectious Diseases

Our group, within the Oxford Vaccine Group (OVG), is committed to the development of innovative vaccines targeting a range of emerging infectious diseases, including alphaviruses, Plague, Q-fever, and Chagas disease. Our mission is to harness cutting-edge vaccine platforms to address these global health challenges, with a primary focus on improving human health. We employ a diverse range of vaccine technologies, including:

- Viral vectors (ChAdOx1, MVA)
- mRNA vaccines
- Virus-like particles (VLPs)
- Subunit vaccines
- Glycoconjugates

These platforms are utilised to design, develop, and carry out both pre-clinical and clinical testing of novel vaccines. Our group's expertise extends beyond vaccine development to include diagnostic tool innovation, particularly for diseases such as Enteric Fever (Salmonella Typhi and Paratyphi) and Neglected Tropical Diseases (NTDs). A key goal is to develop diagnostic assays suited for low-resource settings to enhance clinical management and disease surveillance.

This DPhil programme offers a unique opportunity for aspiring researchers to contribute to our innovative vaccine and diagnostic development initiatives. Students will work on projects aimed at advancing the field of infectious disease research, focusing on the following areas

- Vaccine design using multiple platforms
- Pre-clinical and clinical testing of vaccines
- Functional assays, including virus neutralisation assays and Serum Bactericidal Assays.

Our team is equipped to support a broad range of research projects, offering specialised training in vaccine development and diagnostics. DPhil students will gain hands-on experience in translational research, developing skills that will prepare them to tackle some of the world's most pressing public health challenges.

This programme provides an excellent platform to build a career in the development of vaccines and diagnostics, with the opportunity to contribute to research that has direct global health implications.

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## **Teresa Lambe**

### **Emerging and Outbreak pathogens**

Despite therapeutic advances, the continued emergence and re-emergence of novel infectious pathogens can have devastating healthcare impacts. Increased global interdependence and the ease of human, animal and trade movements facilitate transmission and present multiple opportunities for pathogen spread.

There are a number of novel and dangerous pathogens with recognised pandemic potential, including but not limited to, SARS-CoV-2, Ebola, Marburg, Lassa Fever, Nipah, and Crimean Congo haemorrhagic fever. My team is currently focusing on the development and testing of the Oxford/AstraZeneca (ChAdOx1 nCoV-19/AZD1222) vaccine against SARS-CoV-2 working closely with Oxford Vaccine Group and global teams.

It is widely recognised that the health of humans and animals are interdependent and a number of emerging infectious diseases have a robust animal reservoir. The group are therefore delineating protective immune responses following natural infection in both human and animals to inform therapeutic development and vaccine design.

Using this information, the group are developing vaccines for a number of emerging pathogens with careful consideration of implications for veterinary cross-over and working closely with collaborators at the Pirbright Institute and NIH. Some of the works are at the pre-clinical stage while others have progressed to clinical trials.

This DPhil represents an exciting opportunity to build on the current and innovative program of vaccine development for emerging and outbreak pathogens while working in close collaboration with the Wellcome Trust major overseas research programme in Kilifi, Kenya and other key players for vaccine development against Emerging Pathogens.

Both specialised subject training and generic research capabilities will be developed, including but not limited to:

- Vaccine design (Molecular cloning & vaccine generation)
- Immunogenicity assessment of human samples
- Cellular immune assays (ELISpot, FACS & Intracellular Cytokine Staining (ICS))
- Humoral immune assays (ELISA, FACS & Cultured ELISpot)
- Development of translational assays (Pseudotyped virus assay)

All students will be expected to analyse, interpret and present their data internally and at appropriate conferences. This project will provide a broad range of transferable skills with a unique insight into translational research.

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## **Martin Maiden**

### **The application of the evolutionary and population approaches to the genomic analysis of bacterial pathogens for translation into public health interventions, especially immunisation**

Specific organism interests include the pathogenic *Neisseria* and *Campylobacter*. Highly interdisciplinary work across the Medical and MPLS Divisions.

See, for example: MacLennan JM, Rodrigues CMC, Bratcher HB, Lekshmi A, Finn A, Oliver J, et al. Meningococcal carriage in periods of high and low invasive meningococcal disease incidence in the UK: comparison of UKMenCar1-4 cross-sectional survey results (Reference: Lancet Infect Dis. 2021;21:677-87. Epub 2021/01/23. doi: 10.1016/S1473-3099(20)30842-2. PMID: 33482143)

## Daniel O'Connor

### Utilising the “-omics” toolkit to elucidate the mechanisms underlying immune responses to vaccines and infections

Vaccines have had a transformative impact on public health. However, infection remains an important cause of morbidity and mortality globally, causing ~9% of deaths and two of the five leading causes of disability-adjusted life-years. Acute febrile illness is one of the most common presenting symptoms in healthcare facilities. Signs and symptoms of infection can be non-specific of aetiology. Moreover, diagnostic tests can lack sensitivity and take several hours to days to return conclusive results. Consequently, there is a clinical demand for a new accurate and rapid diagnostic tool — to improve patient care and help tackle the emerging global crisis of antimicrobial resistance.

The immunological processes involved in protective immune responses are not entirely understood and vaccine development has been largely empirical. Recent technological advances offer the opportunity to reveal the immunology underlying vaccine response at an unprecedented resolution. These data could revolutionize the way vaccines are developed and tested and further augment their role in securing global health.

This theme of work explores multi-omics data across a spectrum of immune perturbation — vaccination through to infection. Research includes elucidating the genetic determinants of vaccine responses, describing novel immune correlates of protection, and developing rapid and accurate diagnostics.

## Andrew Pollard

### Oxford Vaccine Group

At the Oxford vaccine group our mission is the design, development, clinical evaluation and laboratory testing of vaccines to improve human health. We aim to achieve our mission with major programmes on:

- Pneumococcal infection and vaccines (Daniela Ferreira);
- Viral outbreak pathogens (Teresa Lambe);
- Typhoid, paratyphoid, Coxiella, meningococcus and plague (Andrew Pollard);
- Non-typhoidal salmonella (Maheshi Ramasamy);
- TB (Rinn Song);
- Use of “omics” to interrogate vaccine responses (O'Connor);
- Social sciences of vaccines (Samantha Vanderslott); and
- Alphaviruses and Chagas (Young Chan Kim).

Further details can be found under names of individual investigators. These major programmes above are in addition to a broad programme of work on COVID19 and the use of human challenge models and other experimental medicine studies. Our work includes opportunities for PhD training for potential students from both clinical and scientific backgrounds.

## Katrina Pollock

Vaccines that provide long-term protection against evolving pathogens eg SARS-CoV-2 and that overcome immunocompromise in older people, are urgently needed. Our knowledge of human immunity is incomplete however, and the opportunity for rational vaccine design has been overlooked.

To address this, the Lymph node single cell genomics ancestry and ageing (LEGACY) Network

studies the key tissue in which the immune response is generated. Using real time ultrasound imaging to sample lymph nodes by fine needle aspiration, coupled with innovative clinical study design, we can map the steady state and vaccine-stimulated immune response over time.

Our work involves detailed immunological techniques such as single cell gene expression, Cellular Indexing of Transcriptomes and Epitopes by Sequencing (CITE-Seq), T cell receptor sequencing, sequencing of immunoglobulin genes, multiparameter flow cytometry and systems serology.

Our experimental medicine model is being used to investigate questions in vaccine-responsive lymph nodes and blood in diverse groups:

1. LEGACY01: what is the distribution of immune cell types in unstimulated and responding lymph nodes after seasonal influenza vaccine in an ancestrally diverse cohort?
2. LEGACY02: how does age affect the priming and recall responses to a novel adenoviral vector vaccine against Crimean-Congo Haemorrhagic Fever?
3. LEGACY03: how does age affect the kinetics of the response to seasonal influenza and COVID-19 booster vaccinations?

Our multidisciplinary clinical and scientific research team welcomes applications from DPhil students across the arc of our work, with immunology as the cross-cutting theme.

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## **Maheshi Ramasamy**

### **Enteric infections and mucosal immune responses**

Infections caused by Gram negative bacteria are a major cause of childhood morbidity and mortality in low and middle income countries. Disease control ultimately requires access to good sanitation, but the current lack of sensitive diagnostic tests and increasing resistance to commonly used antibiotics make vaccines against these pathogens a cost-effective medium-term solution.

This theme investigates immunity against enteric pathogens with a focus on non-typhoidal Salmonella disease. Projects can range from assessing vaccines in healthy volunteer clinical trials to developing laboratory techniques to measure systemic and mucosal immune responses.

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## **Carlo Rinaldi**

The overall purpose of the group's research is to reduce the global burden of hereditary neurological disease. This goal is pursued through three strategic aims:

1. identification of genes associated with neurological diseases,
2. advancement of the current understanding of the molecular mechanisms of pathogenesis in these diseases, and
3. development of effective treatments for hereditary neurological diseases.

This work has recently led to the development of an innovative gene therapy approach for a genetic condition named spinal and bulbar muscular atrophy, relying on viral delivery of an isoform of the disease gene Androgen Receptor and suitable for translation into the clinic (see reference: doi.org 10.1126/sciadv.abi6896) and the identification of genetic variants in the ATP6V0A1 gene as a cause of severe neurodevelopmental conditions (see reference: doi.org 10.1101/2021.06.01.21257500).

In particular, the group are interested in understanding the mechanisms underlying the diversification of the human transcriptomic (RNA editing), the ways those contribute to the functioning of the motor unit in health and disease, and how this knowledge can be harvested to enable targeted correction of mutations in coding sequences of RNA for treatment.

The group employs a combination of transcriptomic analyses, advanced microscopy, cellular and biochemical studies in human iPSC-derived neurons, disease models in mice, and translational studies in human subjects. The group's expectation is that these studies will ultimately reveal

central disease mechanisms of neuromuscular diseases and serve as a foundation for the development of effective disease-modifying therapies.

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## Thomas Roberts

### RNA medicine

Strategies for therapeutic manipulation of gene expression have matured to the point where there are now multiple FDA-approved drugs with diverse mechanisms of action including gene silencing (via RNase H-active gapmer oligonucleotides or RNA interference using siRNA) and direct antagonism of proteins (using aptamers), and exon skipping/inclusion using steric block oligonucleotides. Of particular interest are splice switching oligonucleotides that can rescue expression of proteins associated with Duchenne muscular dystrophy (DMD) and spinal muscular atrophy (SMA) – both paediatric muscle-wasting disorders which previously had very limited treatment options. Central to the development of these therapies is an understanding of disease nucleic acid biology (in terms of understanding the target mRNA splicing) and drug nucleic acid chemistry (the design, composition, and delivery of the therapeutic molecule). These exciting developments are paving the way for a plethora of new molecule medicines across a wide spectrum of disease indications. The group are interested in developing new modalities of therapeutic gene manipulation, including gene editing, RNA editing, and gene activation. Primarily, the group are focused on neuromuscular diseases (such as DMD and SMA) and infantile epileptic encephalopathies (such as Dravet syndrome).

Work in the group encompasses:

1. investigations of novel RNA-targeting or RNA-based therapeutic strategies;
  2. gene expression profiling to better understand disease (especially in terms of spatial-restriction, sub-cellular localisation, and non-coding RNA); and
  3. the development of biomarkers for monitoring responses to therapeutic intervention (with a particular focus on small RNA biomarkers).
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## Anindita Roy

The developmental stage-specific cellular and molecular characteristics of fetal and postnatal progenitors are likely to determine the biology of ALL at different ages. We are particularly interested in high-risk childhood ALL, such as infant ALL and Down syndrome associated ALL. We have recently developed a novel MLL-AF4+ infant ALL model using primary human haematopoietic stem and progenitor cells. The overarching aim of research in our lab is to improve the outcomes of children with high-risk ALL.

The current DPhil projects are in these areas:

1. Developing faithful models of high-risk childhood ALL to better understand leukaemia initiation and maintenance at different ages;
  2. Mechanistic studies to understand key drivers of childhood ALL;
  3. Target discovery and translation of findings from (1) and (2) into preclinical studies; and
  4. Projects using multi-omics to understand how cell intrinsic and/or microenvironmental characteristics of the developmental stage at which a leukaemia originates, drives the biology of leukaemia at different ages.
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## Stephan Sanders

Severe neurodevelopmental disorders (NDD) lead to serious and often life-threatening symptoms including seizures, cognitive impairment, communication problems, and motor dysfunction. Our group aims to use bioinformatics to identify the genetic mechanisms underlying these disorders and to develop therapies to improve the lives of those affected.

We focus on three main research questions:



1. How can we find the genetic variants and genes underlying these disorders in the coding and noncoding genome?
2. What do these genetic variants and genes tell us about the underlying neurobiology?
3. How can we use these insights to develop advanced therapies to help affected individuals?

Over the past decade, our group has used whole-exome and whole-genome sequencing of thousands of individuals to identify hundreds of genes underlying NDDs (Read more about this on the PubMed website) and to understand the role of splicing variants and noncoding variants in these disorders (Read more about this on the PubMed website).

Working with collaborators in the USA (UC San Francisco and Yale) we have generated single-cell datasets with epigenetic (ATAC-seq) and transcriptomic (RNA-seq) data from postmortem brain samples of hundreds of individuals. We use these data to understand regulatory processes underlying brain development and NDDs, including the role of biological sex as a modifier. We also aim to use these data to identify genes and variants that are amenable to genome-targeted therapies, including antisense oligonucleotides (ASOs) and CRISPR-based genome editing.

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## Laurent Servais

### **STRONG (Specialised Translational Research Oxford Neuromuscular Group)**

STRONG (Specialised Translational Research Oxford Neuromuscular Group) has a special interest for newborns screening of genetic condition, Angelman syndrome, innovative outcomes using magneto-inertial technology and wearable devices and natural history studies. The group are working with patients in order to design and conduct efficient clinical trials.

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## Rebecca Slater

### **Paediatric Neuroimaging Group**

The Paediatric Neuroimaging Group can offer a range of DPhil projects related to early life neurodevelopment and clinical research translation. The group's work is focussed on better understanding the development and treatment of infant pain. The group places great importance on translating mechanistic insights from research into clinical practice and can offer DPhil students opportunities to focus on mechanistic research, clinical trials, methodology development (MRI, EEG and analytical approaches) and provide opportunities to work with industry, academia and regulators to optimise the acceleration of innovations into practice.

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## Samantha Vanderslott

### **Vaccines, Health and Society (VHAS) Unit**

The Vaccines, Health and Society (VHAS) Unit is a multidisciplinary research centre that seeks to improve understanding of the roles played by different individuals and groups and their interaction with healthcare practice and medical research. The unit aims to produce theoretical and empirical research in social sciences and create a bridge to public health issues through policy advice, interventions, and public engagement. We draw on a variety of disciplines from sociology, history, behavioural science, health economics, and public policy to combine a wide set of tools and literatures. Further, being based within the Oxford Vaccine Group, benefits from the unique opportunity to interact with vaccinologists, epidemiologists, immunologists, and clinicians. A particular focus lies on studying actors' attitudes and behaviour towards vaccination in society, policy, and media, across time and geographies. More broadly, our interests are also in a wide range of public health topics, including issue prioritisation, disease history, and social mobilisation. Our research unit runs regular research seminars, has ongoing collaborative writing groups on a wide range of topics, and frequently hosts visiting researchers, providing a lively environment for DPhil candidates. We can support a range of DPhil projects on the social aspects

of vaccination and health, including co-supervision with other groups within the Department of Paediatrics (and in exceptional cases outside of the department).

### **Attendance**

The course is full-time and requires attendance in Oxford. Full-time students are subject to the University's Residence requirements.

Provision exists for students on some courses to undertake their research in a 'well-founded laboratory' outside of the University. This may require travel to and attendance at a site that is not located in Oxford. Where known, existing collaborations will be outlined on this page. Please read the course information carefully, including the additional information about course fees and costs.

### **Resources to support your study**

As a graduate student, you will have access to the University's wide range of world-class resources including libraries, museums, galleries, digital resources and IT services.

The Bodleian Libraries is the largest library system in the UK. It includes the main Bodleian Library and libraries across Oxford, including major research libraries and faculty, department and institute libraries. Together, the Libraries hold more than 13 million printed items, provide access to e-journals, and contain outstanding special collections including rare books and manuscripts, classical papyri, maps, music, art and printed ephemera.

The University's IT Services is available to all students to support with core university IT systems and tools, as well as many other services and facilities. IT Services also offers a range of IT learning courses for students, to support with learning and research.

The department has state-of-the-art laboratories with a number of research groups at different locations in Oxford, with most of the groups based at the John Radcliffe Hospital and the Weatherall Institute of Molecular Medicine (WIMM), the Centre for Vaccinology and Tropical Medicine and the Institute of Developmental and Regenerative Medicine at the Churchill Hospital, and the Science Centre at South Parks Road.

Students will have access to the department's IT support and University library services. Workspace will be related to individual circumstances. If undertaking experimental work, bench space will be provided within a laboratory. The provision of other resources specific to a project should be agreed with the supervisor as part of the planning stages of the agreed project.

### **Weatherall Institute of Molecular Medicine**

The Weatherall Institute of Molecular Medicine (WIMM) fosters research in molecular and cell biology with direct application to the study of human disease. The WIMM is the location for the developmental immunology and haematology research groups in the Department.

### **Peter Medawar Building**

The Peter Medawar Building houses an inter-disciplinary research consortium which investigates pathogen diversity through a combination of experimental and theoretical approaches, with links to two University divisions: Medical Sciences, Mathematical, Physical and Life Sciences. This is the location for the HIV research group.

### **Oxford Vaccine Group, Centre for Clinical Vaccinology and Tropical Medicine (CCVTM)**

The Oxford Vaccine Group (OVG) is located in CCVTM which is a purpose built space for research in vaccinology and tropical medicine. The facility includes fully-equipped modern Containment Level 2 and 3 laboratories for the design, development and clinical testing of vaccines. Facilities are designed to accommodate multi-disciplinary working across microbiology, immunology, and molecular techniques in proximity to clinical expertise and trial patients/volunteers.

### **Paediatric Nutrition Research Group Laboratories**

The two Paediatric Nutrition Research Group Laboratories are located in the neonatal unit. One is a visual function laboratory to study the development of visual pathways in brain-damaged infants following neurotropic supplementation of their diets.

The second is a body composition laboratory which house an air displacement plethysmography used to validate new techniques derived from 3-D ultrasound measures of body composition in new-born infants.

### **Institute of Developmental and Regenerative Medicine (IDRM)**

The Institute of Developmental and Regenerative Medicine (IDRM) opened in 2022 and is an available resource for relevant students. At its core is a formal merger of developmental biology and regenerative medicine in the form of 15-20 world

leading research groups comprising 240 cardiovascular, neuroscience and immunology scientists. Our intention as an organisation is to integrate their expertise to foster multidisciplinary collaborations.

### **Library services**

Bodleian Health Care Libraries provides services to the staff and students of the University of Oxford, mainly in clinical medicine, and to the staff of the Oxford University Hospitals NHS Trust. There are over 20,000 books and over 550 journal titles in the Bodleian Health Care Libraries

### **IT resources**

The Medical Sciences Division IT services provide Information Technology services, support and advice to the University of Oxford's Medical Sciences Division. It operates and manages data networks and networked services for the division's departments located on the Oxford Hospital Sites (John Radcliffe, Churchill, Warneford and Nuffield Orthopaedic Centre), the Old Road Campus in Headington, and parts of the Science Area in the centre of Oxford.

### **Supervision**

The allocation of graduate supervision for this course is the responsibility of the Department of Paediatrics and it is not always possible to accommodate the preferences of incoming graduate students to work with a particular member of staff. Under exceptional circumstances a supervisor may be found outside the Department of Paediatrics.

Most students have the opportunity to meet with their supervisor at least three times a term.

You will join one of the department's research groups with primary supervision provided by faculty members in one of the department's laboratory or clinical research facilities. It is highly recommended that individuals speak to and consider a supervisor before they make a formal application.

### **Assessment**

Formal assessment of progress will be made at three points during the course: transfer of status from Probationary Research Student (PRS) status to DPhil Status; this occurs in the 4th term. This is followed by confirmation of status which traditionally takes place either at the departmental annual research day held in late April or at the end of the ninth term. Then the final thesis and oral examination (*viva voce*) before the twelfth term ends.

### **Changes to this course**

The University will seek to deliver this course in accordance with the description set out above. However, there may be situations in which it is desirable or necessary for the University to make changes in course provision, either before or after you commence your course. These might include significant changes made necessary by any pandemic, epidemic or local health emergency. For further information, please see the University's Terms and Conditions (<http://www.graduate.ox.ac.uk/terms>) and our page on changes to courses (<http://www.graduate.ox.ac.uk/coursechanges>).

## Costs

### Annual fees for entry in 2025-26

Fee status	Annual Course fees
Home	£10,070
Overseas	£33,370

### Information about course fees

Course fees are payable each year, for the duration of your fee liability (your fee liability is the length of time for which you are required to pay course fees). For courses lasting longer than one year, please be aware that fees will usually increase annually. Information about how much fees and other costs may increase is set out in the University's Terms and Conditions (<http://www.graduate.ox.ac.uk/terms>).

Course fees cover your teaching as well as other academic services and facilities provided to support your studies. Unless specified in the additional cost information (below), course fees do not cover your accommodation, residential costs or other living costs. They also don't cover any additional costs and charges that are outlined in the additional cost information.

Graduate students who have reached the end of their standard period of fee liability may be required to pay a termly University and/or a college continuation charge.

The University continuation charge, per term for entry in 2025-26 is £672, please be aware that this will increase annually. For part-time students, the termly charge will be half of the termly rate payable by full-time students.

If a college continuation charge applies (not applicable for non-matriculated courses) it is likely to be in the region of £100 to £600. Please contact your college for more details, including information about whether your college's continuation charge is applied at a different rate for part-time study.

### Additional cost information

There are no compulsory elements of this course that entail additional costs beyond fees (or, after fee liability ends, continuation charges) and living costs. However, please note that, depending on your choice of research topic and the research required to complete it, you may incur additional expenses, such as travel expenses, research expenses, and field trips. You will need to meet these additional costs, although you may be able to apply for small grants from your department and/or college to help you cover some of these expenses.

## Living costs

In addition to your course fees and any additional course-specific costs, you will need to ensure that you have adequate funds to support your living costs for the duration of your course.

The likely living costs for the 2025-26 academic year are published below. These costs are based on a single, full-time graduate student, with no dependants, living in Oxford. We provide the cost per month so you can multiply up by the number of months you expect to live in Oxford.

### Likely living costs for one month

	Lower range	Upper range
<b>Food</b>	£330	£515
<b>Accommodation</b>	£790	£955
<b>Personal items</b>	£200	£335
<b>Social activities</b>	£45	£100
<b>Study costs</b>	£40	£90
<b>Other</b>	£20	£40
<b>Total</b>	£1,425	£2,035

### Likely living costs for nine months

	Lower range	Upper range
<b>Food</b>	£2,970	£4,635
<b>Accommodation</b>	£7,110	£8,595
<b>Personal items</b>	£1,800	£3,015
<b>Social activities</b>	£405	£900
<b>Study costs</b>	£360	£810
<b>Other</b>	£180	£360
<b>Total</b>	£12,825	£18,315

### Likely living costs for twelve months

	Lower range	Upper range
<b>Food</b>	£3,960	£6,180
<b>Accommodation</b>	£9,480	£11,460
<b>Personal items</b>	£2,400	£4,020
<b>Social activities</b>	£540	£1,200
<b>Study costs</b>	£480	£1,080
<b>Other</b>	£240	£480
<b>Total</b>	£17,100	£24,420

When planning your finances for any future years of study at Oxford beyond the 2025-26 academic year, it is suggested that you allow for potential increases in living expenses of 4% each year – although this rate may vary depending on the national economic situation.

More information about how these figures have been calculated is available at [www.graduate.ox.ac.uk/livingcosts](http://www.graduate.ox.ac.uk/livingcosts).

## Document accessibility

If you require a more accessible version of this document please contact Graduate Admissions and Recruitment by email ([graduate.admissions@admin.ox.ac.uk](mailto:graduate.admissions@admin.ox.ac.uk)) or via the online form (<http://www.graduate.ox.ac.uk/ask/form>).