

Examples of Potential Supervisors and PhD project titles

Please note that this list is not exhaustive! There is a huge portfolio of research at Imperial College London and this list represents examples of opportunities within the scheme. Successful applicants can of course explore high quality project proposals not listed here. And please note that this list is subject to change as potential supervisors join or leave the College.

IMMUNITY	
Potential Supervisor	Example of PhD project
Prof Danny Altmann	Immune correlates of Zika virus exposure
Dr Darius Armstrong-James	Modulation of macrophage cell death in pulmonary aspergillosis
Dr Becca Asquith	Mathematical modelling of the impact of CD8+ T cell dynamics on the control of persistent viral infection
Prof Charles Bangham	The autologous anti-tumour T-cell response to HTLV-1-induced leukaemia
Dr Beth Holder	Determinants of efficient trans-placental antibody transfer from mother to fetus: protecting infants through antibody engineering
Dr Cecilia Johansson	Innate immunity regulates disease severity during respiratory viral infections
Prof Sebastian Johnston	Role of host dsDNA and NETs in rhinovirus-induced exacerbation of allergic airway inflammation
Prof Anastasios Karadimitris	iNKT cell immunotherapy for haematopoietic stem cell transplantation and B cell lymphomas
Dr George Kassiotis	Tuning of immune reactivity by endogenous retroviruses: mechanisms and consequences
Prof Ajit Lalvani	Immunity to TB infection: correlates of resistance and clearance in the human lung
Prof Matthias Merkenschlager	Gene regulation in the immune system
Dr Anne O'Garra	Transcriptional regulation of IL-10 versus proinflammatory cytokine production in myeloid cells via type I IFN dependent and independent mechanisms in mouse models and human disease including infection and allergy
Prof Peter Openshaw	Immune regulation of B cells in RSV infection of human volunteers
Prof Caetano Reis e Sousa	Immunity to cancer induced by dendritic cells

Mr Mikael Sodergren	Defining the oncological signalling pathways of cannabidiol (CBD) in pancreatic ductal adenocarcinoma
Dr David Thomas	Focuses on the biology of EROS, a newly characterised protein, and how it controls the generation of reactive oxygen species as well as other processes in both innate and adaptive immunity.
Dr John Tregoning	T cell immunity in the lungs as a potential vaccine target
Prof Victor Tybulewicz	Signaling pathways controlling B cell survival

INFLAMMATION	
Potential Supervisor	Example PhD Project
Prof John Bassett	The role of Daam2 and non-canonical wnt signalling in the pathogenesis of osteoporosis
Dr Jacques Behmoaras	Macrophage plasticity in systemic sclerosis
Prof Sir Stephen Bloom	Adipose and pancreatic inflammatory signals as a major cause of insulin resistance
Prof Marina Botto	The role of complement C1q in angiogenesis - implications for tissue regeneration
Prof Andrew Bush	The role of lineage negative innate lymphoid cells in paediatric asthma
Prof Waljit Dhillon	Hypothalamic inflammation in the control of metabolic function
Dr Margarita Dominguez-Villar	The role of environmental factors on regulatory T cell dysfunction in autoimmunity
Dr Nadia Guerra	The role of natural killer cell receptors
Dr James Harker	The role of IL-17A in the formation of lung lymphoid structures in chronic inflammation
Dr Mark Isalan	A multi-systemic double targeted therapeutic strategy for Huntington's disease
Prof Steve Ley	Regulation of innate immunity by TPL-2 kinase
Prof Clare Lloyd	Molecular mechanisms underlying development of preschool wheeze: the role of gene: environment interactions
Dr Cristina Lo Celso	Short- and long-term consequences of inflammation on haematopoietic stem and progenitor cells, from in vivo murine experimental models to clinical data

Prof Justin Mason	In vitro and in vivo investigation of the role of adenosine deaminase 2 in the pathogenesis and treatment of the systemic vasculitides
Prof Miriam Moffatt	Omic Investigations of co-culture of bacterial isolates with human bronchial epithelial cells differentiated at the air liquid interface
Dr Philip Molyneaux	Investigating host microbial interaction in Idiopathic pulmonary fibrosis
Dr Fu Siong Ng	Effects of acute and chronic systemic inflammation on ventricular electrophysiology and arrhythmic risk
Prof Matthew Pickering	The role of complement deregulation in glomerulonephritis
Prof Sarah Rankin	Effects of lung inflammation on the activity of mesenchymal stem cells
Dr Susanne Sattler	Cardio-immunology – the role of the adaptive immune system in heart failure
Prof Molly Stevens	Designing Biomaterials for Cellular Applications
Dr Joanthan Stoye	Natural variation in lentiviral accessory proteins
Dr Jessica Strid	The role of type 2 immunity in tissue homeostasis and tumour immune-surveillance in the skin
Prof Martin Wilkins	Application of Mendelian randomization to identify inflammation targets for the treatment of pulmonary hypertension
Prof Robert Wilkinson	Role of Sirtuins, PARPS, Resolvins and Eicosanoids in hyperinflammatory HIV-associated tuberculosis: the immune reconstitution inflammatory syndrome (TB-IRIS)
Prof Graham Williams	Role of local thyroid hormone metabolism in chronic inflammation and tissue repair

INFECTION	
Potential Supervisor	Example PhD Project
Prof Wendy Barclay	Identification and characterization of human host factors that affect the outcome of influenza virus infection
Dr Jake Baum	The role of the erythrocyte cytoskeleton and membrane in malaria parasite invasion of the red blood cell
Prof Rosemary Boyton	The role of peptide / MHC in modulating NK cell activation in bacterial lung infection

Dr Peter Cherepanov	Host factors involved in retroviral DNA integration
Dr Christopher Chiu	Determinants of cross-reactive lung resident T cell memory during human influenza infection
Prof George Christophides	Characterisation of plasmodium vivax transmission in the Amazon
Dr Fiona Culley	Age related changes to innate anti-viral immunity in the lung
Dr Aubrey Cunnington	Identifying mechanisms of pathogen tolerance to improve survival in life-threatening infectious diseases
Dr Christl Donnelly	Exploration of heterogeneity in the West African Ebola outbreak - transmission, health-seeking behaviour and control
Dr Carlton Evans	Research enabling TB elimination through socioeconomic interventions and other innovative strategies, principally based in Peru
Prof Neil Ferguson	Characterising the relationship between prior antibody titre and disease severity in dengue infection and modelling the consequences for vaccine impact
Prof Gad Frankel	The impact of antibiotic treatment and diet on pathogen host interaction and the microbiota
Prof Azra Ghani	Estimating the impact and incremental cost-effectiveness of regional co-operation strategies for moving towards malaria elimination in sub-Saharan Africa
Prof Nicholas Grassly	Identifying the cause of poor oral rotavirus vaccine efficacy in low income settings
Prof Angelika Grundling	Investigate the mechanism by which the signalling nucleotide cdiAMP impacts the mecithillin resistance and biofilm formation in Staphylococcus aureus
Prof David Holden	How Salmonella virulence proteins interfere with innate and adaptive immunity
Prof Alison Holmes	Antimicrobial Resistance and Healthcare Associated Infections - a global problem
Prof Michael Levin	Integrating genomic variation and RNA expression data from TB and severe bacterial infection to understand immunopathogenesis
Dr Geodele Maertens	Identification and characterization of beta-retroviral integrase binding proteins

Prof Gloria Rudenko	The role of the Variant Surface Glycoprotein coat in immune evasion in the African trypanosome <i>Trypanosoma brucei</i>
Prof Shiranee Srisakandan	Understanding complexities of immediate response to bacterial sepsis
Dr Michael Way	The role of Arp2/3 isoforms in development and tissue homeostasis
Prof Dale Wigley	Targeting bacterial DNA repair systems for antibiotic development
Prof Sivaramesh Wigneshweraraj	Phage-inspired solutions to combat antibacterial resistance
Prof Thomas Williams	Mechanisms of malaria protection afforded by recently identified Glycophorin mutations in the Kilifi population.
Prof Xiaodong Zhang	Structural basis of transcription regulation of bacteria stress response and a new strategy for antibiotic development

INFORMATICS	
Potential Supervisor	Example PhD Project
Prof Paul Aylin	The role of electronic patient records in averting failure to rescue events in hospital patients
Prof Mauricio Barahona	From 'omics data to landscapes: dimensionality reduction and clustering through geometric graphs in single cell data
Dr Marc Chadeau-Hyam	Combining dynamic models and feature selection algorithms to identifyOMIC biomarkers involved in the natural history of chronic disease progression: application to genetic, epigenetic and gene expression data for lung cancer
Prof Stuart Cook	Dissection of RNA-sequencing, ribo-sequencing and miRNA signatures to understand cardiovascular disease mechanisms
Prof William Cookson	Metagenomics of the lung microbiome in health and disease
Prof Adnan Custovic	Integrating complex data structures to identify subtypes of childhood asthma: a probabilistic machine learning approach
Dr Timothy Ebbels	New tools for analysis of short highly multivariate time series in genomics and metabolomics
Prof Paul Elliott	Multi-omic approaches to understanding the aetiology and pathogenesis of cardiometabolic disorders
Prof Majid Ezzati	Bayesian ensemble models for population health forecasts
Prof Jorge Ferrer	Role of non-coding genome variation in human diabetes

Prof Amanda Fisher	Integrating cell cycle control and pluripotency in stem cells
Prof Darrel Francis	Linking big data from the Health Informatics Collaborative with an AI approaches to echocardiographic imaging datasets to develop automatic risk predictive models from echo images
Prof Paul Freemont	Developing novel synthetic biology biosensors for the detection of disease biomarkers
Prof Yike Guo	Identifying biomarkers for respiratory diseases using deep learning
Dr Petra Hajkova	The role of DNA modification interplay in epigenetic reprogramming
Dr Oliver Howes	Determining the effect of neuroinflammation on brain functional networks
Dr Prapa Kanagaratnam	Using arrhythmia mechanisms to develop tools to better interpret and treat cardiac rhythm disturbances
Prof Christoph Lees	Using novel bio-informatic approaches to identifying the impact of different management strategies in preterm fetal compromise on clinical and health-economic outcomes using data from observational and randomised controlled studies
Prof Boris Lenhard	The Role of Long-Range Developmental Regulation in Understanding Disease Variation and Mechanism
Prof Azeem Majeed	Using data from electronic primary care records for disease surveillance
Prof Jamil Mayet	Big data analysis from five BRC hospitals in the NIHR Health Informatics Collaborative to investigate the benefits of an invasive coronary approach in elderly patients presenting with acute coronary syndromes
Dr Irene Miguel-Aliaga	The transcriptional plasticity of the intestinal epithelium
Dr Fu Siong Ng	Using Granger Causality analysis to classify electrophenotypes of atrial fibrillation
Dr Declan O'Regan	Predicting patient survival in heart failure using machine learning image interpretation
Prof Nicholas Peters	AI Informatics of data from consumer devices for diagnosing, triaging and monitoring health and disease
Prof David Rueda	Exploring the molecular mechanisms of AID regulation in live cells and with single molecule resolution

Prof Sonia Saxena	Using data from electronic primary care records to reduce the burden of childhood illness and avoidable hospitalizations
Dr Rohini Sharma	Defining a novel prognostic radiogenomic score in hepatocellular cancer
Dr Ioanna Tzoulaki	Investigate the shared role of inflammation in cardiovascular disease and cancer aetiology
Dr Simon Walsh	Computed tomography in fibrotic lung disease: predicting outcome using computer algorithms
Dr Tobias Warnecke	Insights into infection from dynamic analysis of bacterial transcriptomes
Dr Zachary Whinnett	Development of smart implantable physiological monitoring systems