IDEU Symposium, 14 June 2024
Big Data Institute

Programme:

Time	Title	Speaker
9.30-9.35	Welcome	Angela Brueggemann
Session 1		*Chair: Odile Harrison*
9.35-9.55	Clinical and pathological implications of hepatosplenic schistosomiasis: The SchistoTrack Cohort	Goylette Chami
9.55-10.15	The ART of antiretroviral treatment in pregnancy	Joris Hemelaar
10.15-10.35	The RECOVERY Trial - Beyond COVID-19	Leon Peto
10.35-10.55	How can Oxford best contribute in this new era of global health?	Alan Bernstein
10.55-11.30	Tea, coffee and networking	
Session 2		*Chair: Leon Peto*
11.30-11.50	Perspectives on the population biology of *Neisseria gonorrhoeae*	Odile Harrison
11.50-12.10	Learning from antigen testing for SARS-CoV-2 in the UK	David Eyre
12.10-13.00	IDEU early- and mid-career researcher short talks	
	Measuring the impact of the COVID-19 pandemic on invasive bacterial disease: findings from the IRIS Consortium	David Shaw
	Towards large-scale inference of bacterial ancestral recombination graphs	Shing Zhan
	An automated pipeline for identifying liver tissue in ultrasound video to support clinical decision making for hepatic schistosomiasis	Ellie Ockenden
	Care pathways for chronic infectious diseases in rural sub-Saharan Africa: ethical considerations for biomedical research implementation	Sandrena Frischer
	Determinants of participant attrition and re-joining in SchistoTrack	Christin Puthur
	Modelling normal physiological responses to infection treatment to enable personalised patient management	Qingze Gu

13.00-13.45	Lunch and networking	

Session 3		*Chair: Joris Hemelaar*
13.45-14.05	The INEOS Oxford Institute	Stewart Cole
14.05-14.40	IDEU early- and mid-career researcher short talks	
	Amoxicillin vs co-amoxiclav for hospital treatment of community-acquired pneumonia	Jia Wei
	Barcoding *Neisseria gonorrhoeae* for the discriminative analysis of population structure	Anastasia Unitt
	High-resolution genomic characterisation of the bacterial pathogen *Haemophilus influenzae*	Krisna Made
	Understanding the population structure of *Moraxella catarrhalis* using core-genome multilocus sequence typing	Iman Yassine
	A core genome typing tool for *Staphylococcus aureus* surveillance	Nazreen Hadjirin
14.40-15.00	Identifying direct risk factors in UK Biobank	Helen Fryer
15.00-15.20	Nasopharyngeal competition, bacteriocins and vaccines	Angela Brueggemann

15.20-15.40	Tea, coffee and networking	

Session 4		*Chair: Angela Brueggemann*
15.40-16.00	An overview of the MSD Investigator Studies Program and our vaccine research areas of interest	David McIntosh, MSD (industry sponsored session)
16.00-16.20	NYC lab bench to global multiomics: Azenta's epic journey	Nicholas Zoulias, Azenta (industry sponsored session)
16.20-16.30	Concluding comments	Richard Peto

Speaker biographies:

Angela Brueggemann
IDEU Director and Professor of Infectious Disease Epidemiology
https://www.ndph.ox.ac.uk/team/angela-brueggemann

My research group focuses on understanding how changes in bacterial population structure impact on global health and vaccine initiatives. We are especially interested in bacteria that are major causes of life-threatening diseases like meningitis and pneumonia, the most important of which is *Streptococcus pneumoniae*. I lead the IRIS Consortium, a global surveillance programme tracking invasive bacterial disease, and have a Wellcome Trust Investigator Award to investigate bacteriocins, which are antimicrobial peptides produced by bacteria to inhibit competing bacteria.

Goylette Chami
Associate Professor
https://www.ndph.ox.ac.uk/team/goylette-chami

Dr Chami is an Associate Professor and Robertson Fellow in the Big Data Institute and Nuffield Department of Population Health. She leads the complex and high-dimensional prospective cohort—SchistoTrack—which aims to understand the progression of liver morbidities in the context of intestinal schistosomiasis (*Schistosoma mansoni*) and endemic coinfections. Dr Chami holds advisory roles for the World Health Organisation on morbidity diagnostics and surveillance. She has been endorsed as an Exceptional Promise Academic, profiled by Nature, and awarded the Odile Bain Memorial Prize for advances in medical parasitology. She completed MPhil and PhD degrees at the University of Cambridge.

Joris Hemelaar
Associate Professor
https://www.ndph.ox.ac.uk/team/joris-hemelaar

I am an NDPH Senior Clinical Research Fellow and an Honorary Consultant Obstetrician at the John Radcliffe Hospital, Oxford. I trained in molecular biology and genetics at Leiden University, molecular immunology in Oxford, and biochemistry at Harvard. I completed my medical school and specialty training in Obstetrics and Gynaecology in Oxford. My research focuses on the association of maternal HIV infection and antiretroviral therapy with adverse maternal and child outcomes, with a view to developing predictive, preventative and interventional strategies. I also investigate the global molecular epidemiology of HIV, which impacts transmission, pathogenesis, diagnosis, treatment, and HIV vaccine development.

Leon Peto
NDPH Senior Clinical Research Fellow
https://www.ndph.ox.ac.uk/team/leon-peto

Leon Peto is an NDPH Senior Clinical Research Fellow, and an honorary consultant in Infectious Diseases and Microbiology at Oxford University Hospitals NHS Trust. He joined the department in late 2020 to work on the RECOVERY trial, which is testing treatments for patients admitted to hospital with COVID-19.

Alan Bernstein
Director of Oxford Global Health
https://www.globalhealth.ox.ac.uk/our-researchers/alan-bernstein

Alan Bernstein is Professor of Global Health and Director of Oxford Global Health. He is President Emeritus, Canadian Institute for Advanced Research (CIFAR, 2012-2022), Professor Emeritus, University of Toronto and Distinguished Fellow, Munk School of Global Affairs and Public Policy. His research contributions range from landmark contributions to cancer research, stem cell science and haematopoiesis. Prior to CIFAR, Prof Bernstein was the founding President of the Canadian Institutes of Health Research (CIHR), Canada's federal agency for the support of health research (2000-2007). Subsequently (2008-2011), he was the Executive Director of the Global HIV Vaccine Enterprise in New York, an international alliance of researchers and funders charged with accelerating the search for an HIV vaccine. Prof Bernstein was a member of Canada's Vaccine Task Force, and chairs or is a member of advisory and review boards in Canada, the U.S., U.K., Italy, France, and Australia.

Odile Harrison
NDPH Senior Research Fellow
https://www.ndph.ox.ac.uk/team/odile-harrison

My work explores the population genomics of bacterial pathogens including *Neisseria gonorrhoeae*. I am particularly interested in defining bacterial lineages using genome sequence data as this allows strains associated with distinct pathologies including antimicrobial resistance to be more rapidly identified. Such information brings with it opportunities for improving diagnostics, preventing infection through vaccination and the capacity to limit antimicrobial resistance

David Eyre
Professor of Infectious Diseases
https://www.bdi.ox.ac.uk/Team/david-eyre

My research aims to understand who gets different infections and why, and how best to prevent, treat and monitor these infections. I also work on developing artificial intelligence tools to help diagnose and treat hospital patients, and to help hospitals run better. I use a range of approaches spanning epidemiology, statistics, causal inference, and machine learning. I work with detailed regional and national scale deidentified healthcare record data. My other research interests include using whole-genome sequencing to study the epidemiology and transmission of pathogens. I am also interested in using sequencing technologies as a novel tool for culture-independent microbiology diagnostics.

David Shaw
DPhil Student
https://www.ndph.ox.ac.uk/team/david-shaw

David is a DPhil student supervised by Angela Brueggemann. He obtained his Bachelor of Medicine and Bachelor of Surgery degree (MBBCh) from the University of the Witwatersrand, Johannesburg, South Africa, and a master's degree in Global Health Science and Epidemiology from Oxford Population Health. David is a member of the IRIS Consortium and is leading the statistical analyses of the data collected in this international prospective surveillance study. The IRIS Consortium aims to understand the impact of the COVID-19 pandemic on rates of invasive bacterial diseases caused by *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Neisseria meningitidis*, and *Streptococcus agalactiae* across a network of national reference microbiology laboratories in 30 countries.

Shing Zhan
NDPH Intermediate Fellow

Shing is developing computational methods and software tools to get evolutionary insights from large pathogen genomic datasets. Before joining the NDPH, he was a Janssen-Oxford Translational Genomics Fellow in the Nuffield Department of Medicine, working on genealogy-based methods to analyse biobank-scale human genomic data.

Ellie Ockenden
DPhil Student

I am a second-year DPhil student supervised by Goylette Chami and Alison Noble. The aim of my DPhil is to develop a diagnostic assistive tool for the staging of liver fibrosis caused by schistosomiasis. My current work focuses on the identification of liver tissue in ultrasound video, which constitutes the first step for training a classification model for staging schistosomal liver fibrosis.

Sandrena Frischer
DPhil Student

I am a social scientist and former research project manager pursuing my DPhil in Population Health. I hold a BA in Peace and Conflict Studies from UC Berkeley and an MSc in Public Health for Development from the London School of Hygiene and Tropical Medicine. My doctoral research focuses on ethical challenges implementing research on diseases of poverty in sub-Saharan Africa, with an emphasis on the nature of research collaborations with local health systems. Through my DPhil, I engage with Ugandan researchers to understand how best to ensure continuity of care for biomedical research participants.

Christin Puthur
Data Scientist

I am a data scientist in the Big Data and Helminth Epidemiology Research Group (Chami Group) which studies schistosomiasis epidemiology in Uganda. My role involves managing multi-dimensional data collected from the Ugandan SchistoTrack Cohort which includes clinical survey data, images, and spatial data. I am involved in assisting with data management, developing scripts for various tasks, and performing data wrangling. I recently also investigated factors associated with participant attrition from the cohort using statistical analysis methods.

Qingze Gu
DPhil Student

I am a DPhil candidate in Clinical Medicine at Nuffield Department of Medicine. My academic background lies in clinical epidemiology and pharmacology. My interest in improving healthcare through real-world data shaped my doctoral research, which focused on exploiting electronic health records to improve infection management.

Stewart Cole
Executive Chair, INEOS Oxford Institute
https://www.ineosoxford.ox.ac.uk/

Professor Stewart Cole is an internationally renowned microbiologist working in global health. He has made outstanding contributions to HIV and HPV genomics, and antimicrobial resistance research. However, he is most highly acclaimed for his pioneering work on the pathogenicity, evolution, and genomics of the mycobacteria responsible for tuberculosis (TB) and leprosy. His team harnessed genome-derived information to accelerate TB drug and vaccine discovery and development. Candidate drugs that arose from his work are currently in clinical trials. Throughout his career he has strived to translate findings from his discovery research into interventions that benefit human health. Professor Cole is a past president of the Institut Pasteur, Paris, having previously led the Global Health Institute at the Swiss Federal Institute of Technology in Lausanne.

Jia Wei
Postdoctoral Researcher

I completed my DPhil in Clinical Medicine at the Nuffield Department of Medicine (NDM), where my research focused on modelling longitudinal trajectories of antibody responses after SARS-CoV-2 infection and vaccination, using data from the UK's national COVID-19 Infection survey. I am now a post-doctoral researcher within NDM, focusing on electronic health records and infectious diseases. I have a strong interest in exploiting routinely collected patient data from various sources, applying advanced statistical and machine learning methods in infectious disease research, improving their surveillance, prediction, and management.

Anastasia Unitt
NDPH Early Career Research Fellow

In my research I apply large genetic datasets to investigate bacterial pathogens, predominantly *Neisseria gonorrhoeae*. I am interested in exploring how genetics can reveal the distribution of traits of interest across bacterial populations – for example antimicrobial resistance genes, or vaccine antigen variants. Using this population genetics approach, I examine DNA sequence variation across thousands of isolates. My research interests also include horizontal gene transfer, strain taxonomy, interactions with commensal *Neisseria* species, and the application of evolutionary theory to explain observed patterns in genotypes.

Krisna Made
DPhil Student

I am a third-year DPhil student in the Nuffield Department of Clinical Medicine and Department of Biology. Coming from a clinical background with a postgraduate qualification in molecular biology and genetics, my research now focuses on the population genetics of *Haemophilus influenzae*, a fastidious, human bacterial pathogen known to cause invasive diseases. In my research, I characterise *H influenzae* population structure, as well as conduct comparative genomics studies detecting genetic variants associated with invasiveness and capsule acquisition to improve our understanding of the bacterium and may be putative vaccine candidates that are broadly effective against all strains.

Iman Yassine
Postdoctoral Researcher

I completed my PhD at Institut Pasteur, France, where I focused on analysing whole genome sequence data of the gram-negative organism, *Shigella* spp. Since February 2023, I have been a member of the Brueggemann lab, where I am now focusing on using core genome multilocus sequence typing (cgMLST) to understand the population structure of various organisms.

Nazreen Hadjirin
Postdoctoral Researcher

My research is on pathogen genomics, specialising in antimicrobial resistance, transmission dynamics and host adaption in infectious pathogens. I also have extensive experience in molecular microbiology and high throughput sequencing. I gained my PhD in microbial genomics from the University of Cambridge. Currently, I work with Angela Brueggemann on two projects; to develop a core genome typing tool for *Staphylococcus aureus* as well as to study bacteriocins in the species.

Helen Fryer
Senior Postdoctoral Scientist

Helen Fryer is a senior postdoctoral scientist in the Wilson lab. Her work focuses on the design and application of statistical genetics methodology to investigate how host-pathogen genetic interactions shape the development of disease. Her background lies in the development of methods at the interface of dynamical modelling, evolutionary modelling, and statistics. She has used these methods to investigate within-host interactions of pathogens and immune responses, with a particular focus on HIV-1.

David McIntosh
Executive Director Scientific Affairs for Vaccines, MSD

Dr E David G McIntosh is an Australian paediatrician, vaccinologist and infectious disease specialist, now the Executive Director Scientific Affairs for Vaccines at MSD. He has worked on vaccines and immunisations against *Streptococcus pneumoniae*, *Neisseria meningitidis*, RSV, influenza, arboviruses and norovirus, amongst others. He also worked on the antibiotics tigecycline and piperacillin-tazobactam, and the anti-parasitic agent moxidectin, now licensed for human use, for the treatment of River Blindness (onchocerciasis). David is an Honorary Clinical Senior Lecturer at Imperial College, London. In the Queen's Birthday Honours List in June 2011 he was appointed as a Member in the General Division of the Order of Australia, within the Australian Honours System. He holds the following qualifications: MBBS, MPH, LLM, PhD, FAFPHM, FRACP, FRCP&CH, FFPM, DRCOG, DCH, Dip Pharm Med.

Nicholas Zoulias
Senior Sales Specialist, Azenta

Nick earned his PhD in Evolutionary Biology from the University of Manchester in 2014. He then joined the University of Sheffield as a postdoctoral researcher, where he spent several years expanding his skill set. Transitioning to industry, Nick became an account manager at GENEWIZ from Azenta life sciences, leveraging his academic background to serve clients effectively. After a promotion, he now excels as a Senior Sales Specialist, utilising his deep knowledge of Molecular Biology and Next Generation Sequencing to ensure researchers needs are met with precision and excellence.