

2022

Presentations from New Fellows

13 September 2022

15.30 **Welcome from the President**

Professor Dame Anne Johnson PMedSci

Presentations from new Fellows:

15.35 **Health for all childbearing women and newborn infants: science, collaboration, participation, action**

Professor Mary Renfrew OBE FRSE FMedSci

Emerita Professor of Mother and Infant Health, University of Dundee

15.55 **Life after stroke: Light from the CogFAST study**

Professor Rajesh Kaloria FMedSci

Professor of Cerebrovascular Pathology (Neuropathology), Newcastle University

16.15 **Reaching the WHO elimination targets for schistosomiasis: the importance of a One Health perspective**

Professor Joanne Webster FMedSci

Professor of Parasitic Disease, Royal Veterinary College

16.35 **Break**

17.00 **87 and 360: Mortality measured in months**

Professor Hugh Montgomery OBE FMedSci

Professor of Intensive Care Medicine, University College London

17.20 **A 'site-seeing' tour of molecular mode of actions to help us find better drugs faster**

Dr Chun-Wa Chung FMedSci FMedSci

Senior Director and UK Head of Structural and Biophysical Sciences, GlaxoSmithKline

17.40 **Which is the chicken, which is the egg? The surprising science of relationships in struggling families**

Professor Helen Minnis FMedSci

Professor of Child and Adolescent Psychiatry, University of Glasgow

18.00 **Close**

Presentations from new Fellows

Health for all child-bearing women and newborn infants: science, collaboration, participation, action

Professor Mary Renfrew OBE FRSE FMedSci

Current global and national maternity and newborn health systems are struggling to provide the care needed so that women and infants both survive and thrive. Tackling the complexity of providing the care and services needed is not easy, but the urgent need to reduce mortality and improve the quality of care for all women and newborn infants means that it is imperative to identify new solutions. In this paper I will draw on my experience of leading inter-disciplinary collaborations in national and global research, policy, standards, and implementation. Barriers to evidence-based policy and practice include disciplinary and methodological silos in research; women and babies being seen as separate; a predominant focus on technical interventions as the solution to safety; and women's views and experiences being seen as distinct from, and secondary to, their safety. As a consequence, policy, practice, resources, and research funding often reflect an over-reliance on interventions, a focus on physical health at the expense of mental health and well-being, neglect of models of care that provide preventive, supportive, respectful, and relationship-based care, separation of women and newborn infants, and ongoing inter-disciplinary differences. A new approach is needed in this often contentious and intensely inter-disciplinary field to build evidence, policy, and system change through genuine cross-sectoral participation. I will describe the example of our international collaboration for The Lancet series on midwifery. One output of this work was an innovative evidence-based framework for quality maternal and newborn care that can be used in any context to assess and plan the quality of care and services. Drawing on a wide spectrum of evidence it includes the practices, service organisation, values, philosophy, and characteristics of care providers needed by all women and newborn infants. This work has had a transformative impact globally and has underpinned new evidence-based guidance, professional education, standards, policy, and research priorities. Cross-sectoral collaboration has the potential to transform the design and delivery of health systems and improve health.

Mary Renfrew is Professor Emerita at the University of Dundee, Scotland. She is a health researcher, educator, and midwife who has conducted research in maternal and newborn care, midwifery, and infant feeding for more than 40 years, and whose work has helped to shape international public health and maternity policy and practice. Her work focusses on improving health and wellbeing, the quality of care, reducing the impact of inequalities, and evidence-informed policy and practice. She founded the multidisciplinary Mother and Infant Research Unit, which she directed for 25 years. She was principal investigator for the ground-breaking global Lancet Series on Midwifery and was Lead Adviser to the UK Nursing and Midwifery Council to develop the regulator's radical new standards of midwifery. She is a founding member of the International Quality Maternal and Newborn Care Research Alliance, has worked as Consultant for the World Health Organisation, and has been Trustee of UNICEF UK. She was awarded honorary membership of the British Association of Perinatal Medicine in 2018 and inaugural Senior Investigator status with the UK National Institute for Health Research in 2008. She is the first midwife or nurse to be elected as a Fellow of the Royal Society of Edinburgh and the first midwife to be elected as a Fellow of the Academy of Medical Sciences.

Life after stroke: Light from the CogFAST study

Professor Rajesh Kalaria FMedSci

Stroke is a leading cause of disability, dementia and death worldwide. One in three of us will either have a stroke, develop dementia or succumb to both. I will provide selected updates on the clinicopathological aspects of the primarily MRC funded Cognitive Function after Stroke (CogFAST) study, which began over 20 years ago. Elderly stroke survivors were prospectively recruited from hospital stroke registers and comprehensively assessed at 3 months post their first stroke and subsequently annually thereafter. Brain scans and post-mortem studies were also undertaken to reveal outcomes as part of a multidisciplinary project. Data from this largest study of its kind and relevant animal models to simulate human pathophysiological mechanisms, show that vigorous control of modifiable risk factors and lifestyle can deliver quality life after stroke.

Rajesh Kalaria is Leader of the Neurovascular Research Group in the Translational and Clinical Research Institute, Newcastle University. He is a Professor of Pathology (Cerebrovascular Diseases) and a neuroepidemiologist. He qualified from King's College, University of London and the Royal College of Pathologists. His interests include the interface between Alzheimer disease (AD) and vascular dementia (VaD), Post-Stroke Dementia and Small Vessel Diseases of the Brain. He has contributed to consensus criteria for Vascular Cognitive Impairment and leads dementia research projects in indigenous populations of developing countries, particularly sub-Saharan Africa. Professor Kalaria is a member of the Africa Task Force of the European Academy of Neurology. He is currently the liaison officer for IBRO-WFN and President of the International Society for Vascular Behavioural and Cognitive Disorders (VasCog).

Reaching the WHO elimination targets for schistosomiasis: the importance of a One Health perspective

Professor Joanne Webster FMedSci

Over the past year we have seen the launch of a new WHO Neglected Tropical Diseases (NTD) Roadmap, together with revised Disease Control and Elimination Guidelines and Targets. Across all there is now a clear emphasis on the need to incorporate a One Health approach, recognizing the critical links between human and animal health and the environment. Schistosomiasis, caused by *Schistosoma* spp. trematodes, is a NTD of global medical and veterinary importance, with over 220 million people currently infected as well as untold millions of livestock. Despite over two decades of mass administration of the anthelmintic praziquantel to, predominantly, school-aged children, the burden of schistosomiasis remains extremely high in certain regions, particularly within sub-Saharan Africa. Whilst animal hosts are acknowledged as zoonotic reservoirs across Asia, within Africa, in contrast, any zoonotic component of schistosomiasis transmission and its implications for disease control has, until now, been largely ignored. This is particularly the case for *S. haematobium*, the causative agent of urogenital schistosomiasis in humans, which was assumed to be an exclusively human infection – and thus amenable to elimination by targeting treatment of humans alone. Here, presenting our recent epidemiological, clinical, molecular and modelling work across both Asia and Africa, I will illustrate the transmission dynamics of *Schistosoma* spp., and notably the emerging risk raised by both wildlife reservoirs and viable hybridization between human with livestock schistosomes. Such research emphasizes that a truly multi-disciplinary One Health perspective must be implemented in order to achieve the 2030 WHO Roadmap targets of

elimination of schistosomiasis as a public health problem and ultimately towards interruption of transmission

Joanne Webster is Professor of Parasitic Diseases at the Royal Veterinary College and heads their Pathogen Flow in Ecosystems strategic grouping. Joanne is also Director of the London Centre for Neglected Tropical Disease Research (LCNTDR), Professor of Infectious Diseases at Imperial College London's Faculty of Medicine, and on the Board of Directors for Fauna and Flora International (FFI). From its inauguration in 2002 (until 2014) Joanne served as co-Director of the Schistosomiasis Control Initiative (SCI), which, during this period, provided approximately 300 million anthelmintic preventative chemotherapeutic treatments for children and at-risk adults across sub-Saharan Africa, and was awarded the Queen's Anniversary Prize and medal for International Public Health Impact. Joanne sits on a range of World Health Organization's (WHO), Food and Agriculture Organization, and beyond, working groups. Her research and disease control activities have been awarded a number of further medals and awards, such as the CA Wright Medal for Outstanding Contribution to Parasitology and the Chalmers Memorial Medal for Outstanding Contribution to Tropical Medicine.

87 and 360: Mortality measured in months

Professor Hugh Montgomery OBE FMedSci

We hear much of climate change. 'Scientists' and 'Politicians' are addressing it, we are told. But there is a difference between talking and tackling, discussing and doing. The last three decades have seen only expanding quantities of hot air. The result is that greenhouse gas emissions are still rising steeply, as is related atmospheric energy gain. We have triggered six positive feedback loops, all of which interact, and sudden binary 'flips' in our weather systems - all on a background of an anthropogenic mass extinction. What can we do to survive? Will we in medicine actually act, or merely continue to document our own extinction?

Hugh Montgomery is Professor of Intensive Care Medicine at University College London (UCL) where he also directs the Centre for Human Health and Performance. He has published more than 550 papers (many related to hypoxic adaptation; paracrine renin-angiotensin systems; and the physiological responses to extreme environments). He was science lead for the 2007 Caudwell Xtreme Everest Expedition, and has won a number of national and international awards.

Being a commissioner, and then co-lead, on two Lancet Commissions on Human Health and Climate Change, he now co-chairs the 35-institution 27-country Lancet Countdown on Health and Climate Change. He has written and lectured extensively on the subject; was appointed London Leader by Greater London Authority's Sustainable Development Commission; attended many of the international 'COP' negotiations and leads the children's climate education programme 'Project Genie'.

Hugh has also consulted in the field of Artificial Intelligence as applied to Health, for DeepMind Health. He has patented a treatment for cancer wasting and prevention of injury in stroke; a new technology for patient hydration; a novel mask for the removal of pollutants; and a new asthma inhaler.

He has also been an archaeological diver and a high-altitude mountaineer. Hugh is also the author of the award-winning children's book, *The Voyage of the Arctic Tern* as well as *Cloudsailors*. He wrote and presented the five Royal Institution Christmas Lectures of

2007, and *Who Sank the Mary Rose* a year later. He initiated the international documentary *The Story of Us*, and another on climate change and flooding (2021).

A 'site-seeing' tour of molecular mode of actions to help us find better drugs faster

Dr Chun-Wa Chung FMedSci FMedSci

We all recognise that choosing the right molecular target for drug discovery for a particular disease indication is very important. Disease and genetic associations go some way to help us but we often lack sufficient knowledge of how to design molecules to successfully achieve the efficacy and safety we need at the outset. An understanding of the molecular mode of action (MMOA), or how the molecular details of drug binding link to disease pharmacology is necessary for rational drug design.

From unravelling the MMOA of phenotypic BET inhibitors that opened up a new target class for drug discovery to understanding the distinct way a new antibiotic traps an enzyme in action to overcome resistance, this 'site-seeing' tour illustrates the power of being able to visualise where and how compounds interact with their protein targets to develop new medicines.

Chun-Wa Chung is a Senior Director at GSK's major European research site in Stevenage where she heads the structural and biophysical science department. Her work on epigenetic proteins, especially bromodomains, enabled the design of new inhibitors of this previously unexploited target class, with several examples progressed into clinical trials for cancer and inflammatory diseases. She has served on multiple funding and advisory committees, most recently for the MRC and Wellcome Trust and is passionate about access, equity and inclusion in STEM.

Which is the chicken, which is the egg? The surprising science of relationships in struggling families

Professor Helen Minnis FMedSci

Historically, we have thought of children as blank slates - and of parents as having THE key role in writing on those blank slates. Yet each child comes into the world with a unique temperament and some children are easier for parents to influence than others. Since I began my involvement in science, I have been interested in how abuse and neglect is associated with poor mental health. In 2017, we published findings that overturned many of my previous assumptions: that abused and neglected children are much more likely than their peers to have neurodevelopmental conditions such as ADHD and Autism – and that these are not caused by the abuse and neglect. We have since shown that having both a neurodevelopmental condition and being abused and neglected, places children at 'double jeopardy' of developing symptoms of severe mental illness in adolescence. We are now exploring double jeopardy for physical health problems. For me, science is all about challenging assumptions and I have enjoyed the way these findings have overturned some of my own assumptions. Our surprising findings have opened exciting new avenues of research and suggest new ways for supporting struggling families and preventing abuse and neglect

Helen Minnis is Professor of Child and Adolescent Psychiatry at the University of Glasgow. She has had a longstanding clinical and research focus on the psychiatric problems of abused and neglected children. Currently her focus is on intervention research, including a randomised controlled trial of an infant mental health service for young children in foster care and a randomised controlled trial of Dyadic Developmental Psychotherapy for primary school-aged children in adoptive or foster placements. She is also conducting behavioural genetic research focussed on the role of abuse and neglect and its overlap with neurodevelopment across the life-course. She has collaborations with colleagues at the Institute of Psychiatry, Psychology and Neuroscience at King's College London, the Universities of Aalborg and Aarhus, Denmark and with the Gillberg Neuropsychiatry Centre, Gothenburg, Sweden.
