Cystic Fibrosis Trust

UK Cystic Fibrosis Conference 2023

Tuesday 3 October

Programme

Welcome

I'm delighted to welcome you to this year's UK CF Conference. In the autumn of 2022 a refreshed list of priorities for CF research was identified. These will inform Cystic Fibrosis Trust's research activities over the coming years, and are the focus of this year's conference.

Access to CFTR modulators in the UK has changed many people's perspective and experience of CF. In the opening plenary of the conference, Professor Jane Davies will reflect on how we need to 're-learn' CF. Her talk has been guided by views of people with CF and their families, who kindly participated in a focus group prior to the event.

We are united in developing better treatments for all people with CF including those who are unable to benefit from CFTR modulators – and this is reflected in our research awards portfolio and today's programme. The third in our top 10 list of CF research priorities is relieving gastrointestinal symptoms, and I'm excited to hear about ongoing research in this area at the conference. Another topic on today's agenda, diagnosing and treating CF lung infections, continues to be an important topic for everyone with CF.

I intend to interact with as many of you as I can today, and I encourage you to make the most of the opportunities to learn new things, and use new contacts to accelerate our progress towards a life unlimited for everyone with cystic fibrosis.

Dr Lucy Allen
Director of Research and Healthcare Data, Cystic Fibrosis Trust

Programme

9.30–10.00am **Registration**

10.00–11.45am **Session 1: Opening session**

- 10.00–10.15am **Welcome**
  - Katherine Cowan, meeting facilitator
  - David Ramsden, Cystic Fibrosis Trust
  - Dr Lucy Allen, Cystic Fibrosis Trust

- 10.15–10.40am **Opening plenary – 'Re-learning cystic fibrosis'** – Professor Jane Davies, Imperial College London

- 10.40–11.00am **Partnership update 1– The CF Innovation Hub at Cambridge University** – Professor Andres Floto, University of Cambridge

- 11.00–11.15am **Partnership update 2 – CF AMR Syndicate: Connecting the community for impact** – Dr Paula Sommer, Cystic Fibrosis Trust; Connie Takawira, Medicines Discovery Catapult & Dr Ed McIver, LifeArc

- 11.15–11.30am **Partnership update 3 – Partnerships with LifeArc, The value of the expert lived experience** – Dr Catherine Kettleborough, LifeArc & Lorna Allen, Cystic Fibrosis Trust

- 11.30–11.45am **Cystic Fibrosis Trust Research Strategy** – Dr Lucy Allen, Cystic Fibrosis Trust

11.45am **Tea and coffee break**

Click here to read the speaker biographies for this session

Professor Jane Davies

12.15–1.30pm Session 2: Symptoms and complications of CF

Click here to read the speaker biographies for this session

Professor Alan Smyth

- 12.15–12.25pm **Gut feelings: unravelling gastrointestinal symptoms in CF** – Professor Alan Smyth, Nottingham University
- 12.25–12.35pm **Preventing bowel cancer in CF** – Professor Stephen Renshaw, Sheffield University
- 12.35–12.45pm **Taming gut dysbiosis, inflammation and abdominal symptoms** – Professor Daniel Peckham, Leeds University
- 12.45–1.00pm **Q&A**
- 1.00–1.30pm **Early Career Researcher flash posters for session 2**

Click here to read the list of posters for this session

1.30–2.30pm Lunch break

2.30–3.45pm Session 3: CF Lung infections

Click here to read the speaker biographies for this session

Dr Martin Welch

- 2.30–2.40pm **What's on the menu? Why *Pseudomonas aeruginosa* loves the CF airways** – Dr Martin Welch, University of Cambridge
- 2.40–2.50pm **Host and pathogen determinants of pulmonary aspergillosis in cystic fibrosis** – Professor Darius Armstrong James, Imperial College London
- 2.50–3pm **Exploiting bacterial quorum sensing signals to diagnose *Pseudomonas aeruginosa* infection in cystic fibrosis** – Professor Miguel Camara, Nottingham University
- 3–3.15pm **Q&A**
- 3.15–3.45pm **Early Career Researcher flash posters for session 3**

Click here to read the list of posters for this session

3.45–4.15pm Tea and coffee break

4.15–5.50pm Session 4: Underlying cause of CF

Click here to read the speaker biographies for this session

Dr Paola Vergani

- 4.15–4.25pm **Exploiting fluorescence assays for screening small molecules and CFTR variants** – Dr Paola Vergani, UCL, London
- 4.25–4.35pm **Fixing CF-causing variants – update on the Gene Editing SRC** – Dr Patrick Harrison, University of Cork, Ireland
- 4.35–4.45pm **CF lung disease: from inflammation to repair** – Dr Robert Gray, Glasgow University
- 4.45–4.55pm **Deubiquitinases as therapeutic targets: modulation of ion channel function in the CF airway epithelium** – Dr James Reihill, Queens University Belfast
- 4.55–5.10pm **Q&A**
- 5.10–5.40pm **Early Career Researcher flash posters for session 4**
- 5.40–5.50pm **Closing remarks** – Dr Lucy Allen, Cystic Fibrosis Trust

Click here to read the list of posters for this session

Poster viewing drinks reception 6–8pm

For a full list of the posters, please see page 12 of the programme.

Speakers

Listed by session

Welcome and introduction

Katherine Cowan

Conference facilitator

Katherine is an independent facilitator with over 20 years' experience of designing and delivering health research consultation and strategy development programmes internationally. Her professional background is in social research, and she has a particular interest in public involvement in decision-making processes. She also delivers facilitation skills training. From 2008-2023 Katherine was Senior Adviser to the James Lind Alliance. She was a key contributor to the development of its priority setting method and facilitated the CF research priorities refresh. For more information and publications please visit **www.katherinecowan.net**

Dr Lucy Allen

Director of Research and healthcare data
Cystic Fibrosis Trust

Lucy joined Cystic Fibrosis Trust in late 2019. Lucy's previous experience includes building and leading research collaborations with industry, other research charities and clinical academics across a wide range of disease areas such as respiratory, mental health, and cancer and nutrition for the National Institute of Health Research (NIHR). She has also lead Research and Development projects for GE Healthcare, developing radiopharmaceuticals for cancer and Alzheimer's disease. Lucy also has a PhD in lung inflammation and infection.

David Ramsden

Chief Executive,
Cystic Fibrosis Trust

David has been Chief Executive of Cystic Fibrosis Trust since 2016. He has worked in the charity sector for over 20 years –initially with the British Red Cross and he then spent 10 years as Chief Executive of BBC Children in Need. Prior to that he worked for Ernst & Young and is a Fellow of the Institute of Chartered Accountants of England and Wales.

Session 1: Opening session

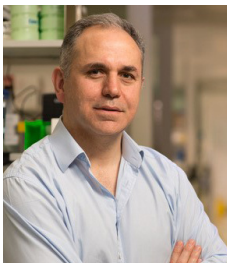
Professor Jane Davies

Imperial College London

Jane Davies is Professor of Paediatric Respirology & Experimental Medicine at the National Heart and Lung Institute, Imperial College London, in England and is a National Institute of Health Research Senior Investigator. She is an Honorary Consultant in Paediatric Respiratory Medicine, Royal Brompton Hospital, one of the largest CF clinics in Europe. Her main areas of research interest are cystic fibrosis chronic lung infection and clinical trial design. She directs a Strategic Research Centre focused on *Pseudomonas aeruginosa*, training future clinical and scientific researchers in CF infection. Jane has been global lead investigator on a large number of international trials of CFTR modulator drugs, including in children and infants and a member of the Strategy Group of the UK CF Gene Therapy Consortium. To support paediatric studies, she established the Lung Clearance Core Facility on behalf of the European CF Society, standardizing this more sensitive pulmonary outcome measure. She leads the NIHR CF National Research Strategy Group and is President-elect of the European CF Society.

Professor Andres Floto

University of Cambridge



Andres Floto is Professor of Respiratory Biology at the University of Cambridge, Co-Director of the Cambridge Centre for AI in Medicine (CCAIM), and Director of the UK Cystic Fibrosis Innovation Hub.

His basic research is focused on understanding how bacteria interact with the innate immune system and how machine learning methods, including geometric deep learning, can be used to gain systems-level understanding of bacterial pathobiology and develop new antibiotics.

His clinical research is centred around using graph-based machine learning to understand and predict pulmonary exacerbations, and applying deep learning methods to provide individualised clinical forecasting for patients with CF.

Dr Paula Sommer

Head of Research
Cystic Fibrosis Trust

Dr Paula Sommer is the Head of Research at Cystic Fibrosis Trust. Her role is to implement the Trust's research strategy by running the operations of the grants process, developing programmes to ensure the impact of research investments are captured and effectively communicated to the CF communities and, together with the research team, identifying, supporting and co-ordinating national and international collaboration on relevant strategic issues. She has a global academic background in human genetics with her last role as senior lecturer in genetics in Durban, South Africa.

Connie Takawira

CF AMR Syndicate

Connie has been working as a partnership manager for the CF AMR Syndicate since February 2022. Her current focus at the Syndicate is on building and supporting the CF AMR Network, also playing a key role in delivering across multiple areas of the programme including on sector challenge projects like the UK CF Infection Biorepository to further cross-collaborative medicines and diagnostics discovery. Connie has a background in clinical pharmacy, working both in the UK and New Zealand where she specialised in respiratory medicine. She holds an MSc in Global Health from Gothenburg University.

Session 1: Opening session

Lorna Allen

CTAP Involvement Manager
Cystic Fibrosis Trust

Since joining the Trust in 2016 as PPIE lead for the Clinical Trials Accelerator Platform, Lorna's role has evolved to support involvement across the whole Research Directorate and Trust wide activity. Lorna's primary objective is to ensure people living with CF and their families not only have opportunities to inform and influence the development of proposals and clinical trials, but that their insights and expert 'lived experience' defines priorities and direction at the earliest possible stages. Cystic Fibrosis Trust unite the CF community with academia and industry, providing a conduit for collaboration and engagement, leading to better research for all whilst increasing awareness, equality and confidence regarding clinical trial participation. Lorna's daughter has CF and has benefitted from advances in care and treatment made available by previous generations of people with CF participating in research and she is passionate about creating those opportunities for future generations too.

Dr Katy Kettleborough

LifeArc

Catherine (Katy) Kettleborough leads LifeArc's Chronic Respiratory Infection Translational Challenge. The Chronic Respiratory Infection Translational Challenge is an ambitious programme to accelerate scientific innovation for people living with bronchiectasis (BE) and cystic fibrosis (CF). This is done by working with partners, people with CF, academics, charities, healthcare professionals and industry to fast-track scientific discoveries into new clinical solutions to transform how chronic respiratory infections are detected, treated and managed.

Dr Ed McIver

Scientific Director, LifeArc

Ed obtained his degree and PhD in Chemistry at the University of Liverpool and then moved to the University of Texas at Austin as a Postdoctoral research fellow. He then returned to the UK to join Merck Sharp and Dohme as a medicinal chemist and made significant contributions to a range of neuroscience programmes, including Alzheimer's disease and pain. He then moved to MRC Technology (now LifeArc) where he has led a broad range of small molecule drug discovery projects covering a wide range of therapeutic areas and target classes, including oncology, Neuroscience and AMR. His research career to date has resulted in over 35 patents and publications. In his current role, he is leading the therapeutics programs for the Chronic Respiratory Infection Translational Challenge at LifeArc, including the CF AMR Syndicate Collaborative Discovery Program. He is also a member of the CF AMR Syndicate management team.

Session 2: Symptoms and complications of CF

Professor Alan Smyth

University of Nottingham / Queen's University Belfast

Prof Smyth is Dean of the School of Medicine, Dentistry and Biomedical Sciences, at Queens University Belfast and Professor of Child Health at Queens. He holds an honorary appointment as Professor of Child Health at the University of Nottingham and Consultant in Paediatric Respiratory Medicine at Nottingham Children's Hospital. He is the Co-ordinating Editor of "Cochrane Cystic Fibrosis" and has a research programme in MRI imaging of the lung and gut in cystic fibrosis. He led the James Lind Alliance priority setting partnership, which agreed the top 10 research priorities for cystic fibrosis, and the recent refresh of these priorities. When not at work he is a keen cyclist and pilot.

Professor Steve Renshaw

University of Sheffield

Steve Renshaw is the Sir Arthur Hall Professor of Medicine and Head of the Division of Clinical Medicine at the University of Sheffield. He studied medicine at Cambridge and then at Oxford Clinical School. He has been a Wellcome Trust Clinical Training Fellow, an MRC Clinician Scientist Fellow and an MRC Senior Clinical Fellow. His lab focusses on the biology of innate immune cells, particularly the neutrophil, and their relevance to respiratory disease. His major contribution has been the development of the transparent, genetically tractable larval zebrafish as a model for the study of innate immunity in vivo. He has developed several unique transgenic zebrafish which have allowed several important advances in our understanding of inflammation biology and of host-pathogen interaction. This has led to an interest in aspects of the biology of CF.

He continues clinical work in Respiratory Medicine with a special interest in interstitial lung disease associated with a range of multisystem diseases.

Professor Daniel Peckham

University of Leeds

Daniel Peckham is Professor of Respiratory Medicine and Deputy Director of the Leeds Institute of Medical Research at the University of Leeds.

He graduated from Westminster and Charing Cross Medical School (University of London) in 1987. In 1992, he completed his doctoral thesis "Airway Epithelial Sodium Potassium ATPase activity and Cystic Fibrosis" at the University of Nottingham. After working as a senior registrar in Oxford, he moved to Leeds where he leads the Regional Adult Cystic Fibrosis, bronchiectasis and the North of England Primary Ciliary Dyskinesia services.

He pioneered the design and implementation of chronic disease electronic patient records and established a strong base for clinical and basic research in cystic fibrosis. Active research programs focus on CF related inflammation, CFTR modulators, gut dysbiosis, cancer, allergy, big data and clinical trials.

Session 3: CF Lung infections

Dr Martin Welch

University of Cambridge

Martin is Professor of Microbial Physiology and Metabolism in the Department of Biochemistry at the University of Cambridge. His team are particularly interested in understanding why *Pseudomonas aeruginosa* finds the CF airways such an attractive place to live, and how the presence of other microbial species alters the behavior of this insidious pathogen. Along with an international team of colleagues from across the world, and with the Trust's support through SRC017, the consortium has established that the CF airway environment offers a near-optimal balance of the nutrients preferred by *P. aeruginosa*. It was also found that the presence of other species living alongside *P. aeruginosa* in the CF airways has a profound impact on antibiotic resistance, and that there is a novel biological link between antibiotic resistance and virulence in the organism. These features will be introduced and discussed in the presentation.

Professor Darius Armstrong-James

Imperial College London

Darius Armstrong-James is a clinician scientist working in the Department of Infectious Diseases at Imperial College London. He leads Cystic Fibrosis Trust Strategic Research centre in Fungal Immunotherapy (**TrIFIC.org**) and the Imperial Fungal Network of Excellence. He is an Honorary Consultant in Infectious Diseases and Medical Mycology at Royal Brompton and Harefield Hospitals where he established and leads to fungal diseases service and at Imperial College Healthcare where he is part of the respiratory infection and antifungal stewardship teams. His scientific research is focussed on host and pathogen determinants in pulmonary aspergillosis.

Professor Miguel Camara

Nottingham University

He has many years of expertise in quorum sensing-mediated bacterial cell-cell signalling mechanisms with a particular emphasis on the cystic fibrosis opportunistic pathogen *Pseudomonas aeruginosa*. He has led several drug discovery programs aiming at reducing the impact of antimicrobial resistance through novel anti-virulence target discovery and the design of inhibitors against these, mainly targeting quorum sensing-driven mechanisms. Some of the research areas he is working on include: (i) identification of novel biomarkers of infection for the development of point of care diagnostics (ii) molecular mechanisms of biofilm development and adaptation to low oxygen conditions; (iv) identification of novel drugs which prevent biofilm formation or sensitise them to antibiotics; (v) mechanisms of interactions between biofilms and the human host.

As co-director of the **National Biofilms Innovation Centre (NBIC)**, he is currently working with academic and industrial partners on different areas of biofilm research and innovation.

Session 4: Underlying cause of CF

Dr Paola Vergani
University College London

Paola graduated from the University of Pavia and obtained a PhD from the University of Milan in Italy. After a first postdoctoral research period at Wye College, University of London, she moved to the Rockefeller University in New York where she started working on the structure/function of CFTR. In 2006 Paola joined the then Pharmacology Department at UCL as a lecturer. Paola has been at UCL ever since, combining teaching of Physiology and Pharmacology with running a small research lab.

Paola trained in biochemistry and biophysics and spent countless hours measuring small or tiny electrical currents across biological membranes – mainly carried by the CFTR protein. At UCL, thanks to talented young researchers funded mainly by Cystic Fibrosis Trust, her lab developed fluorescence assays to monitor CFTR activity using light as a readout. These are used for basic science studies and for collaborations with industry.

Dr Patrick Harrison
University of Cork, Ireland

Dr. Patrick Harrison is a Senior Lecturer in Molecular Physiology at University College Cork, Ireland where he leads the CF Gene Editing Group. His lab is part of the Trust's Strategic Research Centre on Gene Editing led by Professor Stephen Hart, and has extensive collaborations with additional researchers in London, Italy, Paris, Portugal, and across the USA supported by grants from the CF Foundation (USA) and Science Foundation Ireland. Patrick is the European Editor for the scientific journal Gene Therapy, Chair of the Trust's Research Grants Review Committee, and gave the closing plenary lecture at this year's European CF Conference in Vienna entitled 'Hurdles on the Path to a Cure with Genetic Therapies for CF'.

Professor Robert Gray
University of Glasgow

Robert Gray is Professor of Respiratory Medicine at the University of Glasgow. He has studied inflammation in CF for almost 20 years ranging from biomarker studies to mechanistic biology. His lab is presently studying how inflammation might be altered to improve lung disease and the lung repair process in CF.

Dr James Reihill
Queen's University Belfast

James is a Senior Research Fellow at Queen's University Belfast, with an interest in the role of proteases in the CF airway epithelium. As the Principal Investigator on an MRC Innovation Scholarship supported by a CF Trust VIA award, he undertook a secondment to Almac Discovery, a leading biotech company specialising in targeting the deubiquitinating enzyme class (DUBs). During his presentation, he will provide an overview of his cross-sector project, which explores the potential of targeting DUBs to modulate ion channel function in the CF airway epithelium, to ultimately improve mucociliary clearance.

Poster presentations

Posters shown in **dark red** are not available for viewing at the in-person conference.

Session 2 Posters

2A Efraim Westholm, Lund University
– IGFBP7 – a new player in beta cell function?

2B Nicole Kattner, University of Newcastle
– Altered alpha-cell phenotype in cystic fibrosis pancreata

2C Ryan Marsh, University of Northumbria
– CFTR modulator therapy: gut microbiota composition, function, and intestinal outcomes in CF

2D Ellie Slater, University of Cambridge
– Human mucosal-derived organoids as a model to study epithelial cell biology and disease

2E Charlotte Moore, University of Sheffield
– Mechanisms of tumorigenesis in CFTR-associated colorectal cancer in mouse model systems

2F Stone Elworthy, University of Sheffield
– Using zebrafish to investigate gastrointestinal cancer from cystic fibrosis

2G Rahul Bhattacharya, University of Minnesota
– Studying the role of CFTR as a tumor suppressor in organoid and mouse models of CF associated CRC

Session 3 Posters

3A Yihe Qiao, Imperial College London
– Deep immuno-profiling of Aspergillus bronchitis and allergic bronchopulmonary aspergillosis in cystic fibrosis

3B Tom Williams, Imperial College London
– Characterisation of a cystic fibrosis murine model of allergic aspergillosis

3C Micaela Mossop, Imperial College London,
– Chronic co-infection with *Staphylococcus aureus* mitigates negative effects of *Pseudomonas aeruginosa*

3D Livia Spiga, Imperial College London
– *Pseudomonas aeruginosa* infections: inflammatory biomarkers and protective mechanisms

3E Bjarke Haldrup, Technical University of Denmark
– Evolution of Metabolism in *Pseudomonas aeruginosa* during adaptation to the cystic fibrosis airways

3F Melisa Guer, Braunschweig University of Technology, Denmark **– Extensive metabolic profiling of 414 clinical isolates of *P. aeruginosa* reveals the significance of specific amino acids in virulence and motility**

3G Tom Barton, University of Dundee
– Novel models for the study of host, pathogen and drug interactions in cystic fibrosis lung infections

3H Lucile Hubert, Cardiff University
– Testing novel therapeutics against the cystic fibrosis lung pathogen *Burkholderia multivorans*

Poster presentations

Posters shown in **dark red** are not available for viewing at the in-person conference.

Session 4 Posters

4A Arina Svoeglazova, University Libre de Bruxelles – **T1a nanobody as a tool for studying the F508del mutation effect in NBD1**

4B Mayuree Rodrat, University of Bristol – **Elexacaftor/tezacaftor/ivacaftor restore stability to F508del-CFTR Cl- channels**

4C Diana Veselu, University of Bristol **– Use of Computer simulations to investigate Ivacaftor-induced conformational changes in CFTR**

4D Lucia Nicosia, University College Cork **– Rescuing G542X by adenine base editing: A guide to restore function**

4E Isabelle Rose, St George's, University of London **– Correction of the cystic fibrosis variant G542X and restoration of functional CFTR by adenine base editing**

4F Miriam Greenwood, UCL Great Ormond Street Institute of Child Health **– Nucleic acid delivery using nanoparticle formulations to treat cystic fibrosis**

4G Brogan Richards, Nottingham University, **–Development of biofilm models resembling the cystic fibrosis environment to assess the effectiveness of therapeutic interventions**

4H Hollie Leighton, University of Liverpool, **– Development of a liquid polymicrobial biofilm model for CF therapeutics**

Summer Student posters

SS1 Jasmine Johnston, Edinburgh University, **– Investigating how excess fat in the human pancreas leads to loss of pancreas function in type 2 diabetes mellitus**

SS2 Simran Patel, Imperial College London, **– Activity of colistin and murepavadin against *Pseudomonas aeruginosa***

SS3 Zeyu Chen, University College London **– The therapeutic potential of potassium channel modulation in cystic fibrosis**

SS4 Peixuan Xie, University College London, **– Improving high-content fluorescence assay**

SS5 Ariana Axiaq, Queen's University Belfast, **– Self-supervised machine learning to decipher patient variability in the immune response to infection**

Cystic Fibrosis Trust

2024 marks Cystic Fibrosis Trust's 60th anniversary, and whilst there is much to reflect and celebrate, there is still more to do to ensure that everyone with cystic fibrosis lives a life without limits.

Save the date

Conferences coming up include:

6 March 2024 – CF Clinical Trials Conference Leeds: Addressing patient research priorities through clinical trials (the when and how)

19 March 2024 – Cystic Fibrosis MDT Conference Leeds: Delivering care in the new CF era

UKCFC will return in the autumn of 2024. For more details about any of the above email: **conference@cysticfibrosis.org.uk**

Uniting for a life unlimited