

# Biochemical Society 2022 Award winners

The work and contribution of 11 eminent bioscientists and exceptional early career researchers has been acknowledged in the annual Biochemical Society Awards. Each recipient has been recognized for excellence in their field of the biosciences, ranging from bioenergetics and 3D whole organ microscopy to prokaryotic cells and cancer research.

Professor Colin Bingle, Professor of Respiratory Cell and Molecular Biology at the University of Sheffield, and Chair of the Biochemical Society's Awards Committee, said: "We are living in extraordinary times and the COVID-19 pandemic has helped to shine a light on the value of high-quality research and collaboration in the life sciences. Amongst this year's nominees, there were some excellent, outstanding scientists which made the judging process very difficult. Every year, I am impressed by the contribution of these innovators and it is inspiring to see our winners are all on an upward trajectory in their chosen field. My heartfelt congratulations to our 2022 winners!"

## The AstraZeneca Award



The 2022 AstraZeneca Award will be presented to Dr Sjors Scheres. Dr Scheres is currently joint Head of the Structural Studies division at the MRC Laboratory of Molecular Biology (LMB). After completing a PhD in methods developments for protein crystallography in 2003, he shifted his interest to methods for cryo-EM image processing as a postdoctoral fellow at the CSIC National Centre for Biotechnology in Madrid. In 2010, he became a group leader at the LMB, where he wrote the software package RELION for cryo-EM structure determination. Currently, he combines image processing algorithm developments with the application of these methods to cryo-EM structure determination of amyloid fibrils. In close collaboration with the Goedert group, also at LMB, he pioneered the structure determination of such fibrils from human brain tissue.

Sjors said: "I am thrilled to receive The AstraZeneca Award, especially given its focus on the development of new methods or reagents. It is very rewarding to develop methods that enable others to do new science, and I consider this prize to be a recognition of the usefulness of our methods. Two inspirational scientists who have been particularly influential in my career are my PhD supervisor Piet Gros, who taught me how to do methods development in structural biology, and Richard Henderson, who brought me to the LMB and has advised me on many matters over the past ten years. Both of them instilled in me the importance of choosing the right projects."

## The Centenary Award



The 2022 Centenary Award will be presented to Professor Jeremy Thorner. Professor Thorner is a biochemist recognized for his contributions to our understanding of biological signal transduction mechanisms. Born, raised and educated in the public schools in Quincy, Massachusetts, USA, he received his AB magna cum laude (biochemical sciences) from Harvard College (1967) and his PhD (biochemistry) under Henry Paulus from Harvard University (1972). He was a Jane Coffin Childs Postdoctoral Fellow (1972–1974) under I. Robert Lehman in the Biochemistry Department at Stanford University School of Medicine. Appointed to the faculty at the University of California, Berkeley, in 1974, he held the William V. Power Chair in Biology for 20 years (1991–2011). Since 2020, he's been Professor Emeritus of Biochemistry, Biophysics and Structural Biology in the Department of Molecular and Cell Biology at UC Berkeley. Other honours he has received for his research and teaching include a 10-year MERIT Award (1989–1998) from the National Institute for General Medical Sciences; the Dean's Award for Distinguished Research Mentoring of Undergraduates in the College of Letters and Science at Berkeley (2004); election to the American Academy of Arts and Sciences (2007) and US National Academy of Sciences (2015); and the Herbert Tabor Research Award of the American Society for Biochemistry and Molecular Biology (2019).

Jeremy said: "When I examine the list of previous recipients of the honor of The Centenary Award, and its predecessor the Jubilee Lectureship, I am truly humbled to be placed in the same company. Moreover, I freely

acknowledge that, through me, this high accolade is actually bestowed on each of the many outstanding scientists who worked with me over the past 47 years and were directly responsible for our mutual success.”

### The Colworth Medal



The 2022 Colworth Medal will be presented to Dr Tanmay Bharat. Dr Bharat studied at Oxford, after which he pursued his PhD at EMBL Heidelberg, where he used cryo-EM to study the structure and assembly of pathogenic viruses including Ebola virus, Marburg virus and HIV-1. In particular, he studied the structures of several viral capsid proteins leading to mechanistic insights into filoviral and retroviral assembly in infected cells. As an EMBO/FEBS-funded postdoctoral fellow at the MRC Laboratory of Molecular Biology in Cambridge, he used novel cryo-EM techniques to study macromolecules directly inside cells in their native environment. In his postdoctoral work, he solved structures of molecules forming ordered arrays in bacterial cells including bacterial actin and surface layers. In his independent laboratory in Oxford, he is studying how prokaryotic cells interact with their environment through specialized cell surface molecules. Interaction with the environment is crucial to several processes, such as adhesion to host surfaces in infection and biofilm formation. Tanmay's group leverage their expertise in cryo-EM and electron tomography, combining it with advanced biochemical techniques to study fundamental problems related to prokaryotic cells.

Tanmay said: “I am deeply honoured to receive The Colworth Medal of the Biochemical Society. The list of previous winners is impressive, and I am delighted to join such a prestigious group. This award will put the work of my laboratory in the spotlight, and give recognition to the research my colleagues and collaborators are performing.”

### Early Career Research Award



The 2022 Early Career Research Award will be presented to Dr Hendrik Messal. Dr Messal completed his PhD in 2017 in the lab of Axel Behrens at the Francis Crick Institute London. He is currently a postdoc with Jacco van Rheenen at the Netherlands Cancer Institute in Amsterdam, where he uses 3D whole organ microscopy to explore the molecular mechanisms that shape tissue morphology in the normal and cancerous breast and pancreas.

Hendrik said: “I am delighted to be the recipient of the Biochemical Society’s Early Career Research Award. I thank my nominators and mentors for their continuous support. Above all, this award honors the many outstanding minds I have had the pleasure working with along the years.”

### Early Career Research Award



The 2022 Early Career Research Award will be presented to Dr Maria Marti Solano. Maria is a FEBS Long Term and Marie Skłodowska-Curie postdoctoral fellow at the MRC Laboratory of Molecular Biology. Her research focuses on the study of the relationships between structure, signaling and phenotype that underlie receptor function. In her most recent work, Maria has integrated data on multi-omics, receptor sequence and structure and molecular pharmacology to analyse how G protein-coupled receptor isoform structural and functional variation across human tissues can contribute to system-specific receptor signaling in response to endogenous ligands and drugs.

Maria said: “I am delighted to receive this award. I would like to thank my nominators, especially Dr M. Madan Babu, who is not only a really inspiring scientist but also an excellent mentor. Due to its multi-disciplinary nature, my research would not have been possible without the outstanding experimental and computational collaborators I’ve been lucky to work with in the past years, so I’d like to take this chance to thank them all for their continued support.”

### The GlaxoSmithKline Award



The 2022 GlaxoSmithKline Award will be presented to Dr Ivan Ahel. Dr Ahel is a Senior Wellcome Trust Research Fellow at the Sir William Dunn School of Pathology, University of Oxford. Ivan obtained his MSc in biology at the University of Zagreb, Croatia, in 2000, before undertaking a PhD with thesis work carried out at Yale University in Professor Dieter Söll’s group between 2000 and 2003. In 2004, Ivan joined the Cancer Research UK, London Research Institute, as a postdoctoral Fellow in Dr Stephen West’s laboratory, investigating novel DNA repair protein factors. He was appointed in 2009 as a Junior Group Leader at the Paterson Institute for Cancer Research in Manchester, before moving to the Sir William Dunn School of Pathology, in 2013. The general interest of Ivan’s laboratory centres on the basic cellular mechanisms underlying genome stability and the signaling mediated by the poly(ADP-ribose)

polymerase (PARP) family of enzymes. Ivan's laboratory has been funded by major grants from the Wellcome Trust, Cancer Research UK, Biotechnology and Biological Sciences Research Council and Ovarian Cancer Research Fund Alliance. Since 2012, he's been a member of the EMBO Young Investigator Programme and he is also recipient of the prestigious 2013 Cancer Research UK Future Leaders in Cancer Research Prize.

Ivan said: "I am honoured to be the recipient of the Biochemical Society's GlaxoSmithKline Award. This award also recognizes the fantastic work of my laboratory members and collaborators, and greatly stimulates us to advance our research."

## Industry and Academic Collaboration Award



The 2022 Industry and Academic Collaboration Award will be presented to Professor Matthias Trost. Professor Trost is a proteomics expert with over 20 years of experience in mass spectrometry. He studied chemistry in Freiburg, Germany, and Manchester, UK, completing his PhD in cellular microbiology and proteomics at the Helmholtz-Centre for Infection Research in Braunschweig, Germany, and his postdoctoral research at the Institute for Research in Immunology and Cancer in Montréal, Canada. In 2010, he became Group Leader and Head of Proteomics at the MRC Protein Phosphorylation and Ubiquitylation Unit (MRC PPU) at the University of Dundee. In 2016, he was appointed Professor of Proteomics at Newcastle University. Since 2019, he has been a Wellcome Trust Investigator. Matthias' main biological interest is in phagosome and macrophage biology and particularly signaling events in innate immunity driven by phosphorylation and ubiquitylation. In recent years, his lab has additionally focused on clinical proteomics and using mass spectrometry for drug discovery. For this, the lab pioneered the usage of high-throughput MALDI TOF mass spectrometry for drug screening which has attracted significant industry interest.

Matthias said: "I am very happy to have received this award which recognizes the fruitful industrial collaborations we have had over the years and is credit to the fantastic students and postdocs in my lab. The award will further promote our translational work using mass spectrometry in the area of drug discovery."

## International Award



The 2022 International Award will be presented to Dr James Murphy. Dr Murphy is Head of the Inflammation Division at the Walter and Eliza Hall Institute of Medical Research in Melbourne, Australia. He completed his undergraduate studies in his home town of Christchurch, New Zealand, before completing his PhD studies at the Australian National University, Canberra, Australia, in 2003. As a CJ Martin Fellow of the National Health and Medical Research Council of Australia (NHMRC), he completed postdoctoral training in the lab of the signaling pioneer, the late Tony Pawson (Toronto, Canada). He moved to the Walter and Eliza Hall Institute in 2007 and was appointed group leader in January 2015, Associate Professor in 2017 and Head of the Inflammation Division in 2019. He has pursued a mechanistic understanding of the roles of several pseudokinases, protein kinases, cytokines/receptors and epigenetic regulators in signal transduction, with a particular focus on MLKL, a key pseudokinase in the necroptosis cell death pathway. These studies have culminated in more than 130 publications to date.

James said: "I am delighted and honoured to receive this award. I am grateful to the students, postdocs and technicians in my lab over the years for their contributions to science and for making the lab so much fun, our many collaborators, and our fantastic research facilities, which collectively have made our discoveries possible."

## The Keilin Memorial Lecture



The 2022 Keilin Memorial Lecture will be presented to Professor Leonid Sazanov FRS. Professor Sazanov is currently a professor at the Institute of Science and Technology Austria near Vienna, Austria, and previously was a Programme Leader at the MRC Mitochondrial Biology Unit in Cambridge, UK. His research is pushing the boundaries of structural biology (currently using cryo electron microscopy, previously X-ray crystallography) to study the structure and mechanism of large membrane protein complexes from the domain of bioenergetics, including respiratory complex I and ATP synthase.

Leonid said: "Ever since I was a graduate student in biophysics I was fascinated by energy transduction in nature, seeing how fundamental physical principles lead to the evolution of ever more complex molecular machines in photosynthesis and respiration. It is always amazing to be the first in the world to see the intricate architecture of such machines, when the structure emerges from the sea of data. I am delighted to be awarded The Keilin Memorial

Lecture and Medal, following in the footsteps of many distinguished figures in the bioenergetics field. This is a real honour for me and for all the talented students and postdocs with whom I have worked.”

### The Morton Lecture



The 2022 Morton Lecture will be presented to Professor Valerie O'Donnell. Professor O'Donnell is Professor of Biochemistry at Cardiff University and her research is focused on discovery of inflammatory bioactive lipids generated by circulating blood cells. Using mass spectrometry methods developed in her laboratory, her team uncovered families of unique lipids and demonstrated that many are essential for blood clotting and vascular inflammation. Alongside colleagues, she recently demonstrated that these lipids drive abdominal aortic aneurysm (AAA) development through their interactions with coagulation factors and showed their essential role in venous thrombosis. Her current research, funded by BBSRC and British Heart Foundation, focuses on understanding how phospholipids drive inflammation and coagulation in AAA and COVID-19. She co-leads the ELIXIR UK Bioresource LIPID MAPS, funded by Wellcome Trust. This international consortium with Babraham Institute, Cambridge, Swansea University and University of California San Diego supports the field of lipidomics worldwide, serving over 65,000 users with databases, lipid structure curation, classification, tools and software. She is an Honorary Group Lead at Babraham Institute and Associated Group Lead at UK Dementia Research Institute at Cardiff. Valerie is a Fellow of the Academy of Medical Sciences and Member of Academia Europaea and holds a Royal Society Wolfson Merit Award.

Valerie said: “I am delighted and honoured to accept The Morton Lecture. This would not have been possible without the many fantastic members of my team, past and present, both in the research lab and within the LIPID MAPS group. I have been fortunate to work with many inspiring colleagues over the years and I'm delighted with the recognition the award brings both for our research and our wider contribution to the community under the LIPID MAPS banner.”

### Teaching Excellence Award



The 2022 Teaching Excellence Award will be presented to Dr Dave Lewis. Dr Lewis is a Senior Lecturer in Pharmacology and Bioethics, Faculty of Biological Sciences, University of Leeds. A student education-focused colleague, he is passionate about educational equality and promoting inclusion, providing opportunities within and outside the curriculum for every student to realize their academic and personal goals. Recognizing that increasing numbers of his students were not going onto careers in research, Dave introduced the concept of the capstone project, with its focus on personal and professional development, into his programmes as an alternative to traditional research projects. With colleagues, he has co-created a sector-leading portfolio of 14 different project opportunities, a combination of traditional research projects offered alongside scientific or industry-relevant capstones and those with a civic or societal focus. Dave has freely shared his ideas and resources globally to support colleagues struggling to deliver final-year undergraduate research projects during the current pandemic. Appointed as Chair of the International Union of Basic and Clinical Pharmacology's Integrative and Organ Systems initiative, Dave uses his expertise in research animal sciences to co-create and co-deliver professional education courses in partnership with national pharmacological societies, animal welfare organization and regulatory bodies. The resultant courses cover welfare and ethics for those who care for or use animals in research in the Global South.

Dave said: “I'm extremely honoured to receive this prestigious award. It's been a collaborative team effort – I owe a huge debt of thanks to everybody who has contributed (students, colleagues, external partners). It's only the start of the journey; we need to build on what we have started and encourage others from across HE to come on-board, working collaboratively to fully realize the transformative potential of student capstone projects.”