

ANNUAL REPORT AND FINANCIAL STATEMENTS

for the year ended 31 December

2020

A photograph of a scientist in a white lab coat and blue gloves, using a pipette to transfer liquid into a small vial in a laboratory setting.

*Nurturing the future leaders
in biomedical research*

The Institute was founded in 1891 and for the next 85 years played a vital role in the development of the laboratory aspects of preventive medicine as an independent research institute in the UK.

Financial pressures in the 1970s led to the closure of the research and production facilities. This in turn led to the conversion of the Lister Institute into a highly successful trust awarding prestigious research fellowships from 1982, which in 2003, were revised to become Prize Fellowships. The fellowships continue to deliver on the Lister Institute's strategic aim of nurturing the future leaders in biomedical research.

The Lister Institute of Preventive Medicine is a company limited by guarantee (England 34479) and is a registered charity (206271)

CHAIRMAN'S INTRODUCTION

for the year ended 31 December 2020



Chairman, Professor Sir Alex Markham

I am pleased to present the Lister Institute of Preventive Medicine's Annual Report for 2020 on behalf of the Governing Body (GB).

2020 has been a challenging year for everyone. We have all had to adapt to more constrained living and working, and to embrace technology to keep our organisations, families and friends connected. Despite this, the Lister Institute has weathered the storm of the Covid pandemic well. We received a large number of applications (114) and awarded four Lister Prizes of £250,000 each. One of the 2020 fellows (Tomás Ryan) is our first Prize Fellow from an Irish Institution which is pleasing given the Institute's long-standing relationship with the Guinness Family.

Our fellows and former fellows continue to conduct excellent research, publish in high impact journals and to win awards and recognition for their work. This year, particular congratulations must be given to Dr Marius Clore, Dr Sarah Teichmann, Professor Nigel Scrutton and Professor Andrew Jackson who have been elected as Fellows of the Royal Society; and to Professor Muzlifa Hanifa and Professor Peter Cullen who have been made fellows of the Academy of Medical Sciences. Congratulations must also be given to two of our Trustees: Professor Wendy Bickmore who was awarded the CBE for services to biomedical science and to women in science and to Professor Sir Adrian Bird, one of our Trustees, who won the Brain Prize for his outstanding contribution and impact in the field of Neuroscience.

I would like to thank Professor John Iredale and all the members of the Scientific Advisory Committee (SAC) for their hard work in reviewing the many applications and identifying the Lister Prize Fellows. For the 2020 prizes, the first part of the process was the same as usual, but because of Covid, it was not possible to conduct the interviews as normal. While some funders cancelled their fellowship schemes, the Lister Institute conducted the interviews virtually via Zoom. This worked very well with the candidates still giving presentations and being subject to intense questioning by the panel before the exceptional Prize winners were selected.

This year, since March, all meetings and business of the Governing Body and its sub-committees have been conducted on-line and this has worked remarkably well, although there is a real gap without the personal interactions. As such I would like to thank the members of the Governing Body and Finance and Investment Committee (FIC) for all their hard work and support throughout the year. I particularly wish to thank Mr Michael French who stood down at the AGM as the Treasurer of the Lister Institute after seventeen dedicated years and would like to extend an extremely warm welcome to Mr Murray Legg who has taken over as Treasurer.

The new staff team have settled in well. They have done a grand job of adapting ways of working to enable Lister business and work to continue throughout the pandemic. I especially want to take this opportunity to thank Naomi King who has now fully retired from the Institute. Naomi semi-retired last year but continued to provide support throughout 2020 for our new Operations Manager, Nicola King. I wish Naomi all the very best in her retirement. We are sorry to have to report that Johanna Rigg, one of our pensioners, has died.

Although generally the Institute got through the pandemic well, it has had an adverse effect on some of the business. For the first time, we were unable to hold our Annual Meeting and missed out on the chance to welcome and to hear from our 2020 Prize Fellowship winners. Fellows were also unable to meet and discuss with colleagues to gain support and advice about their work and careers. While we hope we will be able to hold the meeting in 2021, it has been decided that if this is not possible a virtual meeting, including speakers, will be held instead.

Our Summer Studentship scheme was also adversely impacted by the pandemic as most university labs remained closed or

with restricted staff which meant that in most cases, Fellows could not host summer students in 2020. Nine studentships with computer-based (rather than lab-based) projects did go ahead with the students working at home. We have therefore increased the budget for summer students for 2021. 2020 was the 75th anniversary of the Microbiology Society and to help mark the occasion, the Institute had agreed to support five joint studentships in the field of Anti-Microbial Resistance with the Microbiology Society. One of these, won by Dr Serge Mostowy, went ahead and the others will happen in 2021 instead.

We did manage to visit three of the 2019 fellows. It was a real highlight to listen to them give seminars in their own departments, hear how the Lister Prize Fellowship is helping their careers and their research and meet other members of their departments. Sadly, two visits had to be cancelled and will be held once we can travel, meet and hold seminars again. To the fellows and their host institutions we did visit, I would like to express our thanks for their excellent hospitality and ongoing support.

2020 was an exceptionally volatile year in the financial markets, but despite this our investment managers did a good job of protecting our investments and ending the year with a positive outcome. The valuation of our investments at 31 March 2020 (after withdrawal of the funds for the Prize Fellowships and our operational costs) was £44.86M, up from £43.2M in 2019. While we thought we would need to use our liquidity reserve fund (£5M held in cash) to fund this year's prizes, in the end FIC decided not to so this fund remains intact.

The Covid Pandemic has brought science to the forefront of public attention and exemplified the vital importance of research. Nonetheless it is a time of great change and uncertainty with Brexit and the economic impact of Covid both on research charities and government finances. The Lister Institute Prizes of £250,000 provides an excellent opportunity to really impact Fellows' research and careers and ensures we deliver on our stated aim of 'nurturing the future leaders in biomedical research'.

The strength of the Institute is the people associated with it, whether they be our Fellows, members of the Governing Body and its sub-committees, the Membership of the Institute or our staff and to all I offer my sincerest and warmest appreciation.

Alex Markham, Chairman

2020 LISTER RESEARCH PRIZE FELLOWSHIP WINNERS:

Despite the disruptions of the Covid-19 pandemic, we ran our full application process remotely. We identified four researchers working in the UK and Republic of Ireland with the potential to play a leading role in biomedical development.

The individuals to whom we awarded the Lister Prize Fellowships are as follows:



Dr Rebecca Lawson, University of Cambridge
Computational Psychology Across the Lifespan

We know relatively little about how the human brain builds expectations about the world around it. The Lawson Lab seeks to understand why people with neurodevelopmental and psychiatric conditions – including autism, depression, and anxiety – experience the world so differently. Despite being the leading cause of disability, these conditions remain poorly understood. Rebecca's team uses computational models to capture individual differences in the brain processes that drive symptoms. Alongside pharmacology and brain imaging, this research may lead to earlier diagnosis and access to interventions.



Dr Hayley Sharpe, The Babraham Institute
Receptor tyrosine phosphatase signalling mechanisms in health and disease

Cell surface receptors help cells sense and respond to their environment by triggering changes in the cell. Hayley's research focuses on receptor-linked protein tyrosine phosphatases (PTPs) – enzymes that catalyse the removal of phosphate groups from other proteins. Her lab is revealing new insights into phosphatase signalling mechanisms, looking in particular at a family of PTPs that regulate cells' attachment to each other. Her research could uncover new ways of targeting PTPs, for example in cancer or spinal cord injury.



Dr Tomás Ryan, Trinity College Dublin
Gone or misplaced? Retrieving infant memories in adults

Spatial memories are stored in the brain as sparse populations of cells that are activated during learning and required for the retrieval of memories. The goal of Tomás' research is to understand how these memory engram cells are able to store specific memories as information. He is especially interested in understanding the biological mechanisms underpinning the loss of memories formed in early childhood, known as infantile amnesia. Tomás is the first Fellow to be based in an institution in the Republic of Ireland.



Dr Stephan Uphoff, University of Oxford
Imaging DNA repair and mutagenesis in bacteria

When bacteria are exposed to antibiotics, they respond by ramping up their DNA mutation rates. This stress response allows them to develop resistance to treatment. Stephan's research studies how bacterial cells regulate their mutation rates by deciphering the biological mechanisms involved in DNA repair and mutagenesis. His group develops new methods to observe individual DNA repair proteins within living bacterial cells and explore how those bacteria behave in response to stress. The central goal of his work is to understand what drives the evolution of antibiotic resistance.

Note: The academic rank of each Prize winner is shown as at the date of the award.

THE ROLE OF THE SCIENTIFIC ADVISORY COMMITTEE IN SELECTING THE 2020 LISTER PRIZE FELLOWS

“There’s no greater privilege than hearing the best young minds talk about what they want to do and helping them achieve it.”

The role of the Scientific Advisory Committee forms the heart of the Lister’s activities. Chaired by Professor John Iredale, this independent committee reviews and shortlists applications for the annual Lister Prize, interviews candidates, and ultimately recommends outstanding young researchers for the Fellowship.

In 2020, the process was conducted remotely as opposed to through face-to-face discussion. At an early stage, the Lister decided to include virtual interviews in the award process. While other funding bodies chose not to interview in the face of the pandemic, the SAC felt it was a vital element of the process.

A total of 114 applications were received and scored by SAC members. A longlist of 39 went out for peer review. Taking the comments of these external specialists into account, the SAC drew up a shortlist of 11 candidates to interview.

“We consider the quality of science and the excitement that the science generates in the mind of the SAC. We also look for the potential for the Prize to be transformative – both to the individual’s career and the wider scientific area,” explains John.

“That is a challenging thing to try and understand, but we select interviewers who can get under the skin of an idea to work out how it would unlock particular potential.”

Zoom interviews ran over two days in May 2020. A reduced panel of between six and eight SAC members with the most relevant skillsets interviewed each candidate. To maximise time for discussion,

candidates were asked to limit their presentations to a handful of slides.

“A good interview shouldn’t be inquisitorial,” says John. “If we’ve selected the right people – and that’s what happened – then what you get is a fascinating discussion. You know it’s right when it rapidly develops into that as opposed to a question-and-answer session.”

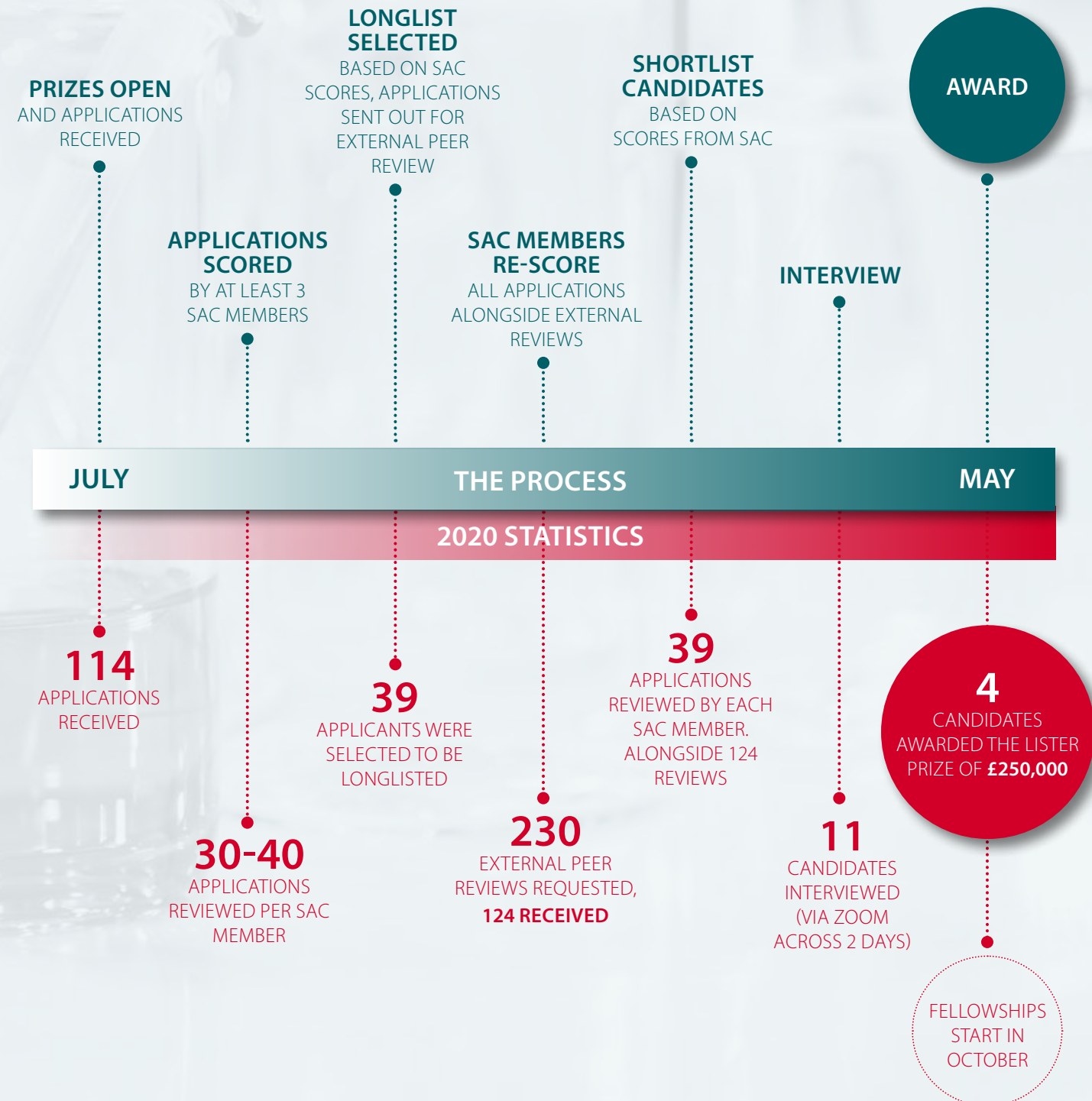
“One could argue that the interviewees were disadvantaged by being unable to assess non-verbal cues from the panel or sense the dynamic in the room. But my personal view is that those who may have appeared more reticent or timid in person may have come across better in a quieter, less intimidating online environment.”

He wants to record his gratitude to the members of the committee:

“All of us felt that we’d worked really hard to make it a success. For the stage it was in lockdown, when everyone was getting a bit fed up, it was a positive experience. We all felt we were back doing something for the community.”

The Lister was delighted to offer Fellowships to four outstanding young researchers in 2020. It also marks the first time we have awarded the Prize to a scientist in an Irish institution.

“We saw some outstanding individuals,” adds John. “And we had the same trouble that we have every year, which is that we’d like to award to more individuals. There are so many good young scientists out there.”



WHO ARE THE SCIENTIFIC ADVISORY COMMITTEE?

The SAC is made up of 12 experienced clinicians and scientists, with a broad range of expertise. Members are appointed to the SAC for one term of six years. It is currently chaired by Professor John Iredale.



Professor John Iredale, BM (Hons), DM, FRCP (Lond), FRCP (Ed), FMedSci, FRSE, MAE, University of Bristol – Chairman of the SAC

John took on the role of Chairman of the Scientific Advisory Board of the Lister Institute in 2018. He is currently Pro Vice-Chancellor Health and Life Sciences at the University of Bristol and holds the chair of Experimental Medicine. His research interests are focused on tissue scarring and regeneration and he has published extensively on these subjects. Professor Iredale was, in the past, the Regius Chair of Medical Science, Dean of Clinical Medicine and Vice Principal Health Services at the University of Edinburgh where he led the Medical School.



Professor Judi Allen, FRSE, FMedSci, University of Manchester

Judi is an immunologist at the University of Manchester investigating the host immune response to metazoan parasites (helminths). A major research focus of the lab is the

function and evolution of the type 2 immune response, with a focus on macrophage biology and immune cell interactions with the extracellular matrix. Prior to moving to Manchester in 2016, Judi was at the University of Edinburgh, where she still holds an honorary professorship.



Professor J Julian Blow, PhD, FMedSci, FRSE, University of Dundee

Julian is Professor of Chromosome Maintenance and Interim Vice Principal (Academic Planning & Performance) at the University of Dundee. Julian's research interests centre on how eukaryotic DNA replication is regulated to ensure that the genome is precisely duplicated with the minimum of errors, with no sections of DNA left unreplicated and with no sections of DNA replicated more than once. Julian is a Fellow of the Royal Society of Edinburgh, a Fellow of the Academy of Medical Sciences and a member of EMBO.

Professor Cyrus Cooper, OBE, MA, DM, FRCP, FFPH, FMedSci, University of Southampton



Cyrus is Professor of Rheumatology and Director of the MRC Lifecourse Epidemiology Unit; Vice-Dean Faculty of Medicine at the University of Southampton; Professor of Epidemiology at NDORMS, University of Oxford. He leads an internationally competitive programme of research into the epidemiology of musculoskeletal disorders, most notably osteoporosis. President of the International Osteoporosis Foundation; Chair of BHF Project Grants Committee; an emeritus NIHR Senior Investigator; and Associate Editor of Osteoporosis International. He has published on osteoporosis and rheumatic disorders and pioneered clinical studies on the developmental origins of peak bone mass. In 2015, he was awarded an OBE.



Professor Aroon Hingorani PhD, FRCP, FESC, University College London

Aroon is UCL Professor of Genetic Epidemiology. He is Director of the UCL Institute of Cardiovascular Science; Cardiovascular Programme Lead for the UCL Hospitals NIHR Biomedical Research Centre; Director of the UCL British Heart Foundation Research Accelerator; and a co-Investigator in the Precision Medicine Research Initiative of the HDRUK

London site. He is Consultant Physician at University College London Hospitals NHS Foundation Trust and an NIHR Senior Investigator. His current work focuses on the use of genetic studies in populations as a tool to identify and validate drug targets, using the Mendelian randomisation principle. He has interest in critical evaluation of the use of genomic and biomarkers data for disease prediction and stratification.



Professor Kikkeri K Naresh, MBBS, MD, DCP, FRCPATH, Fred Hutchinson Cancer Centre & University of Washington, Seattle

Naresh is a haematopathologist, an expert in the diagnosis and translational research of haematological malignancies — especially lymphoma and bone marrow pathology. Naresh recently moved to Seattle, United States and is the Section Head & Professor of Pathology, Fred Hutchinson Cancer Center; and Professor of Pathology, University of Washington. He is an international expert, currently on the editorial board for the upcoming WHO Blue book on Haematolymphoid Tumours. As a translational researcher, Naresh conducts laboratory studies to improve patient care in the era of precision medicine. His focus is the biology of lymphoma, including its genome, lymphomagenesis, and microenvironment.

Professor Catherine Nobes, BSc PhD, University of Bristol

Kate is Professor of Cell Biology and Head of the School of Biochemistry at the University of Bristol. Kate held a Lister Institute Research Fellowship from 1997-2001 and an MRC Senior



Fellowship from 2001-2006, that enabled her to develop her own research interests including the mechanisms underlying how neuronal cell and cancer cell movements are guided through repulsive “contact-inhibition” and attractive interactions with other cells. Kate moved to University of Bristol in 2003 and she has been Head of School for 7 years.



Professor Sir Michael Owen PhD, FRCPsych, FMedSci, FLSW, Cardiff University

Mike is Professor of Psychological Medicine, at Cardiff University. He trained in medicine and obtained a PhD in neuroscience at Birmingham University before training in psychiatry and the Maudsley Hospital in London. He was Director of the MRC Centre for Neuropsychiatric Genetics and Genomics at Cardiff University from 2009-2019. His research focuses on the genetics of psychiatric and neurodevelopmental disorders and is aimed at understanding disease mechanisms and in improving diagnostic processes.

WHO ARE **THE SCIENTIFIC ADVISORY COMMITTEE?**
(CONTINUED)

Professor Barry V L Potter MA, DPhil, DSc (Oxon), FRSB, FRSC, MAE, FmedSci, University of Oxford



Barry is a biological & medicinal chemist and studied chemistry at Oxford. After postdocs in Oxford and Göttingen at the Max-Planck-Institute he was lecturer at Leicester, Lister Institute Fellow and moved to Bath as Head of Medicinal Chemistry before returning to Oxford. His chemical biology research in cell signalling and anticancer drug discovery, with drugs entering clinical trials, has won academic and industrial awards, including four RSC medals and the GlaxoSmithKline International Achievement Award. He was elected to the Academy of Medical Sciences and to Academia Europaea.



Professor Fiona Powrie PhD, FRS FMedSci, University of Oxford

Fiona is Director of the Kennedy Institute of Rheumatology, University of Oxford, as well as a Governor of the Wellcome Trust. She joined the University of Oxford as a Wellcome Senior Research Fellow and has since held various leadership roles including the Sidney Truelove Professor of Gastroenterology and Head of the Translational Gastroenterology Unit. Her research interests include the mutualistic relationship between the intestinal microbiome and the host immune system and how this breaks down in inflammatory disease.



Professor Christoph M Tang, MBChB, PhD, FMedSci, University of Oxford

Chris is Professor of Cellular Pathology at the Sir William Dunn School of Pathology at the University of Oxford. His group studies mechanisms of virulence in human-adapted bacterial pathogens with a particular interest in immune evasion and the response of bacteria to microenvironments in their hosts. The long term aim is to translate fundamental insights of host:pathogen interaction into vaccine development and therapeutics. He is a member of EMBO, and a Fellow of the Academy of Medical Sciences.



Professor Magdalena Zernicka-Goetz, PhD, FMedSci, University of Cambridge and California Institute of Technology

Magda is Professor of Mammalian Development and Stem Cell Biology at the University of Cambridge and Bren Professor of Biology and Biological Engineering at the Californian Institute of Technology. She is interested in how cells make decisions and is best known for her pioneering work on human embryos and creating 3D stem cell models of mouse and human embryos. She has received several prizes, including award in recognition of lifetime contribution to Reproductive Medicine in 2017 and Pioneer award from NIH in 2020.



Professor Elizabeth Patton, BSc, PhD, Western General Hospital

Liz is a Professor and MRC Investigator at the MRC Human Genetics Unit, MRC Institute of Genetics and Molecular Medicine, University of Edinburgh. Liz received a BSc Honours degree from King's College at Dalhousie University, and a PhD from the University of Toronto, working with Mike Tyers to discover how E3 ubiquitin ligases control cell division. Following this, she received a Human Frontier Science Programme Postdoctoral Fellowship to work with Len Zon at Harvard Medical School, where she developed a zebrafish model for melanoma. Her lab uses chemical genetic approaches in zebrafish to investigate the basis for melanoma biology and drug discovery. Professor Patton is currently Editor-in-Chief of Disease Models & Mechanisms, Company of Biologists

SHINING A SPOTLIGHT ON COVID-19

Speeding up testing

Lister Fellow Professor Anne Straube's lab helped develop a rapid test for SARS-CoV-2.



"All lab-based activities stopped, with Covid-related research as the only exception," says Anne, based at Warwick Medical School's Centre for Mechanochemical Cell Biology. "My lab routinely purifies proteins from human and insect cells, so we had all the equipment and reagents available, sitting there, unused. We were delighted to be able to help."

There is debate over the effectiveness of lateral flow tests already in use, which search for antibodies or genetic material in saliva. But the Warwick tool uses sugars to grab onto the virus as it moves along a test strip, delivering a rapid result.

A new target for attacking SARS-CoV-2

Lister Fellow Professor Pete Cullen's lab found a new way in which the SARS-CoV-2 coronavirus attaches to the host cell to make it more infectious.



"The similar SARS-CoV virus, which appeared in 2002, didn't cause a pandemic, and yet both viruses bind to the same cell surface ACE2 receptor," says Pete. "So, why is SARS-CoV-2 highly infectious? There must be something different about it."

The Cullen lab has been studying a family of proteins called neuropilins, which are found on the surface of cells. They already knew that neuropilins bind to proteins that contain a specific amino acid sequence known as a 'CendR motif'. When they examined the spike protein of SARS-CoV-2 – the part the virus uses to bind to the host cell's surface – they spotted this motif. This led to a simple hypothesis: are neuropilins required to enhance SARS-CoV-2 infectivity?

Their November 2020 Science paper validated this idea. It presented evidence that blocking the interaction between the spike protein's CendR motif and neuropilin-1 reduced SARS-CoV-2 infection. From this landmark finding, US company aTyr Pharma is performing clinical trials to repurpose a drug originally developed to treat cancer that interferes with interaction between the CendR motif and neuropilins. It is hoped that this drug may have potential in the fight against COVID-19.



Lateral flow devices offer rapid COVID-19 testing that people can do themselves without the need for expert help. This low cost, paper-based technology delivers results in a matter of minutes.

Anne's colleagues at Warwick Medical School and the University's chemistry department began developing their own test during the first lockdown. To test it, they needed purified stock of the virus's S1 spike protein. But supplies were limited and expensive.

SUMMER STUDENTSHIP SCHEME 2020

This year, the Lister Institute awarded 38 Summer Studentships to help support the biomedical scientists of the future. This scheme supports undergraduate students to carry out summer research projects with Fellows and former Fellows.

Due to the coronavirus pandemic, only nine Studentships were able to go ahead, running remotely. We are delighted to have been able to support these students during a difficult time.

Joint Studentship with the Microbiology Society

Professor Serge Mostowy and University College London student, Olivia Hill, were awarded one of these new joint studentships.

Olivia helped develop an automated approach for analysing images of zebrafish larvae infected with antibiotic resistant Shigella bacteria. She worked with Dr Margarida C Gomes, a postdoctoral researcher in the lab, and took an online image processing and analysis course to help answer the biological questions posed by her project.

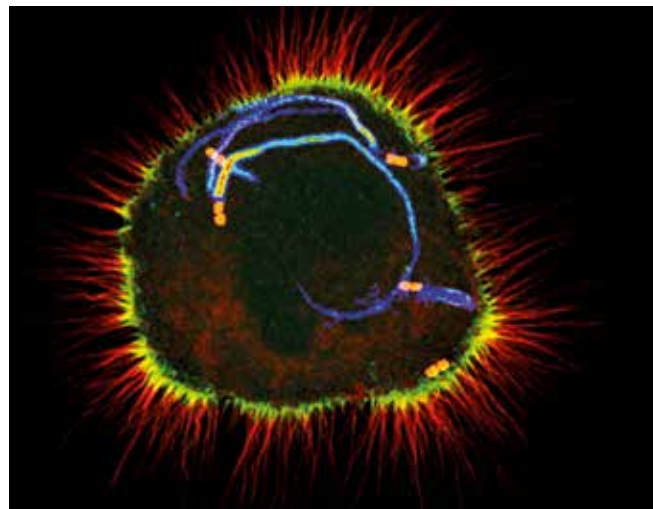
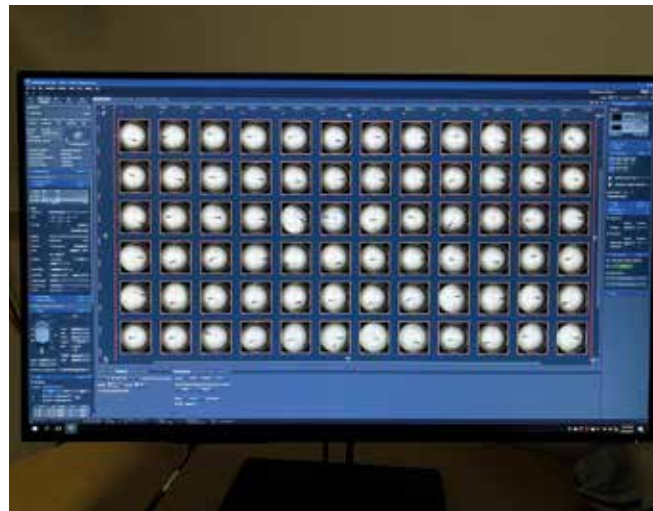
"Being able to introduce a new method to the Mostowy lab and improve the efficiency of leukocyte counting in zebrafish was extremely rewarding and I have high hopes for its impact in the lab," says Olivia. "As a very visual person who's always looked for a way to integrate my love of biology and art, the opportunity to work with the high-quality images produced by the lab felt like a personal breakthrough."

Serge expects her work to form part of manuscripts for publication in the near future.

"Working with Olivia was a great pleasure," he says.

"Although her internship was performed remotely, she continuously demonstrated great interest and excitement in her project."

Olivia has recently accepted an offer for a 4-year funded PhD position in the Francis Crick Institute's Cellular Signalling and Cytoskeletal Function Laboratory, starting in September 2022.



"The immediacy and quality of the support provided by my colleagues during the studentship was incredible," says Olivia. "Professor Mostowy was an excellent mentor throughout the process of applying for PhDs – providing references and giving valuable advice. I am extremely grateful."

"These experiences will be of great value for Olivia's future career," adds Serge. "I look forward to following her progress."

Studentship in Professor Stephen Perkins' Structural Immunology Group

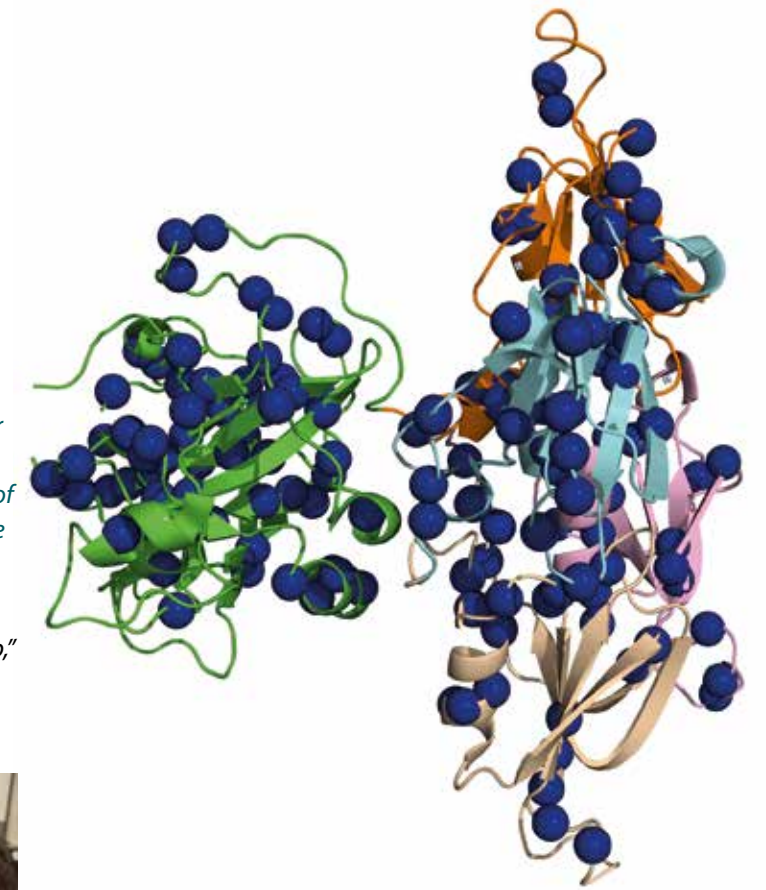
Another UCL student, Weining Lin, joined Stephen Perkins for eight weeks in summer 2020. She upgraded the interactive human coagulation Factor XI database by assembling a set of 69 additional genetic variants. The database will soon go live as a valuable resource for basic and clinical scientists as well as those who work in haemophilia clinics.

"I clearly remember receiving the funding for my studentship," says Weining. "I was so excited and felt so encouraged."



"My undergraduate degree had offered little opportunity to get involved with genetic variants and their integration into an understanding of disease, even though it's the foundation of almost all life sciences-related research. My studentship gave me these skills and also provided me with a great opportunity to develop transferable data skills."

Many research groups, especially those investigating rare diseases, urgently need a relevant well-integrated genetic database as they need a huge amount of data to build up machine learning based algorithm models to predict the pathology mechanisms.



"Weining proved to be a careful and conscientious student," says Stephen. "The studentship offered a great opportunity for her to learn about websites and acquire transferable skills in developing these, all in the context of biomedicine."

The studentship helped Weining with her current master's research project, which focuses on genetic database integration and disease classification. She is currently seeking funding for a PhD, which she hopes to begin immediately after graduating from her master's degree in September. Building up a database forms a key part of her research plans.

"We thank the Lister Institute for its kind support of our endeavours this summer in spite of the issues caused by COVID-19," adds Stephen.

Images and Credits:

Page 10: Image of Olivia and Image of zebrafish larvae on Olivia's computer. Credit: Dr Margarida C Gomes
StudentshipOlivia_1: Airyscan confocal image of a HeLa cell infected with *Shigella flexneri*, which are forming actin tails. Bacterial DNA is shown in orange, SEPT7 in green and F-actin in red. *Shigella MreB* helps to position *IcsA* to form actin tails (highlighted with a 'fire' look-up table to reflect signal intensity). Credit: Ana Teresa López Jiménez

Page 11: Weining1: Factor XI showing the locations of the disease-causing variants as blue spheres on the protein structure. Credit: Victoria Harris and Stephen Perkins

SCIENCE STORIES FROM OUR FELLOWS

Professor Michael Eddleston's work has led to bans on lethal pesticides, which could save 75,000 lives every year in rural Asia.



Self-poisoning with pesticides is one of the most common means of suicide globally. Most deaths happen in rural farming communities in low- and middle-income countries, where highly hazardous pesticides can be bought over the counter and stored in the house. For people in crisis, with suicidal impulses, these chemicals are incredibly easy to get hold of. Just one small sip of the pesticide paraquat can kill.

Without access to these lethal pesticides, those who do harm themselves choose other methods that are less likely to kill them. These people, with usually transient suicidal thoughts, may then be able to get the help they need.

THE SHIFT FROM 'SAFE STORAGE' TO PESTICIDE BANS

Michael's ambition to reduce deaths from pesticide poisoning won him the Lister Prize in 2011. He had already built up a body of research on the effects of pesticide poisoning and the use of these chemicals for suicide in rural Asia.

"Winning the Fellowship enabled me to attack the problem from many angles," says Michael.

He used the funds to hire a project coordinator and a PhD student to help with research.

At the time, the international focus lay on the safe storage of pesticides. But Michael held the belief that bans and the use of alternative, lower-risk chemicals were the only effective ways of reducing deaths. His landmark study, published in *The Lancet* in 2017, proved that safe storage would not prevent deaths by suicide. This proved seminal in driving World Health Organisation (WHO) policy towards greater pesticide regulation.

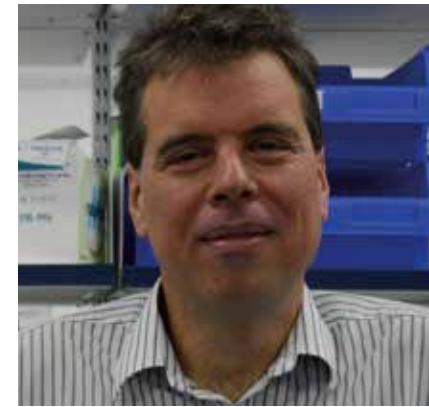
In 2017, Michael established the Centre for Pesticide Suicide Prevention to work with the UN and regulators worldwide to support bans on the most hazardous pesticides. A recent WHO analysis indicates that pesticide regulation is highly cost-effective for suicide prevention. A flurry of bans followed in Nepal, India, and Sri Lanka.



MORE AND MORE PEOPLE SAVED

"I see the charts and the bans, and I know that they mean more people are being saved, and fewer families are experiencing the distress of losing a loved one," says Michael. "The team and I have worked alongside these people in poor, rural areas for years. It's a pleasure to see our work appreciated by them, and to see less stressed communities."

Michael seeks to work with new collaborators to drive the work forward. Tens of thousands of people are alive today who would otherwise have died. Growing global regulation of pesticides in response to his work will continue to reduce the tragic loss of life by suicide.



Many years of research led Professor Daan van Aalten to identify a new neurodevelopmental disease caused by mutations in a single gene.

Daan won the Lister Fellowship in 2006 with his plan to study the structure of two mysterious enzymes and develop inhibitors against them that he might use as tools.

One of these enzymes – O-GlcNAc transferase (OGT) – decorates thousands of proteins inside cells with a sugar called O-GlcNAc. The other enzyme, O-GlcNAc hydrolase (OGA), removes the modification. When Daan won the Prize, little was known about the role these enzymes play or the proteins they affect – only that if their genes are deleted from the genome, then life becomes impossible.

"Colleagues asked why I was wasting my time with this obscure post-translational modification," says Daan. "They had pointed out that there was no evidence that mutations in these enzymes were involved in human disease."

PATIENT ZERO

Then, three years ago, he received a phone call. The clinician on the end of the line had a young patient with unexplained intellectual disability and general development delay.

"They'd done whole genome sequencing on this child and the only relevant mutation they'd found was in OGT," says Daan.

His 2020 paper in the *European Journal of Human Genetics* went on to describe this new condition, naming it OGT-linked Congenital Disorder of Glycosylation (OGT-CDG).

"These mutations can't be totally inactivating because then life wouldn't be possible," explains Daan. "So, they must be subtle – they never completely make the OGT enzyme disappear, nor make it completely inactive."

It is likely that the partial inactivation of OGT leads to the loss of O-GlcNAc modification on certain proteins that are involved in development.

Daan's lab has also found that when OGT is partially disabled, the cell attempts to compensate for the loss of O-GlcNAc levels by producing less of the OGA enzyme that reverses the modification.

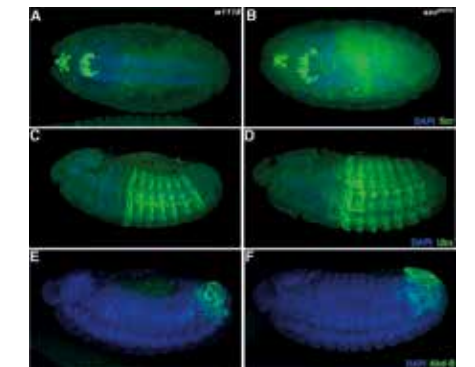
In a finding that ties right back to the start of his Lister project, Daan thinks that developing inhibitors against OGA could form a possible approach to treatment.

"By inhibiting that last remaining bit of the enzyme, we might be able to return O-GlcNAc to a normal level."

DECADES OF RESEARCH AHEAD

The lab is now looking at introducing the OGT mutations found in patients into stem cells, fruit flies, and mice. This will help them explore how O-GlcNAc affects specific proteins and leads to developmental problems.

"We're contacted by families from all over the world who want to know what will happen to their child," says Daan. "We're thinking about bringing doctors, families, and fundamental scientists like us together in an organisation to exchange information and help develop treatments."



GOVERNANCE OVERVIEW

The Governing Body

Governance of the Lister Institute is overseen by the Governing Body which meets twice a year. Members of the Governing Body are Trustees of the charity and have responsibility to the Charity Commission to ensure the charity is well and properly run. There was only one change to the membership of the Governing Body in 2020. Michael French stood down, after 17 years as Treasurer and was replaced by Murray Legg. As ever, we must pay tribute to the quality and dedication of the Governing Body members and the speed and clarity with which they respond to Lister matters.

Finance and Investment Committee

The Finance and Investment Committee met three times in 2020, with two full meetings and one to discuss whether to use the liquidity reserve fund. Long standing member of the FIC – the Chairman and Treasurer Michael French has retired and been replaced by Murray Legg.

Murray is a chartered accountant who spent 35 years with PricewaterhouseCoopers until retiring in 2013. As a partner with PwC he held a variety of senior management, governance and client facing roles auditing and advising large UK listed and unlisted companies. He was a member of the PwC international network's Global Governance Board, and he also served on the PwC UK firm's governance body. Murray is non executive chairman of GlobalData plc and a non executive director of Sutton and East Surrey Water plc, where he chairs the company's audit Committee.

Scientific Advisory Committee

In 2020 there was only one change to the SAC membership. Professor Kikkeri Naresh joined the SAC. In 2020 he moved from Imperial College to the Fred Hutchinson Cancer Centre in Seattle.

To date, the SAC has met once a year to conduct the interviews and undertake any other business required. It has been decided that from 2021 an additional on-line meeting will be held to plan the interviews and conduct all the non-interview business to avoid it being curtailed due to lack of time on the day of the interviews.

Institute Membership



All Fellows of the Lister Institute become Members when they complete the 5 years of their Fellowship. As Fellowship were awarded for 6 years in 2020 because of covid, the GB has agreed that Fellows will become members when they complete their fellowship. At present we have 217 Members and they are all eligible to vote at the AGM.

The Fellows who completed five years of their Fellowship in 2020 and became Members of the Lister Institute in October 2020 are Dr Aga Gambus (University of Birmingham), Dr Thora Karadottir (University of Cambridge), Dr Serge Mostowy (London school of Hygiene and Tropical Medicine), Dr Erica Watson (University of Cambridge) and Professor Steven West (University of Exeter).

In the course of 2020, Professor Kikkeri Naresh (Fred Hutchison Cancer Centre, Seattle) [SAC Member], Mr Murray Legg [Treasurer and Governing Body member] Mrs Naomi King and Mrs Jacky Wilson [previous members of staff] became Members of the Lister Institute.

FINANCIAL OVERVIEW



Murray Legg, Treasurer

2020 was a year of significant volatility in the financial markets as a result of the Covid 19 pandemic and its economic consequences. In addition, further uncertainty was added with Brexit, the US election and trade disputes.

The Lister Institute has its low volatility liquidity reserve fund, which was established to enable the Lister to ride out a major market correction. It continues to provide a buffer against this uncertainty and any ensuing fall in the markets. The FIC had several discussions during the year about whether the 2020 Lister Prizes should be funded from this liquidity reserve fund as the value of the main portfolio had dropped significantly. In the end it was decided not to do this and the Prizes were funded from the main portfolio as markets recovered.

Our two investment managers, Cazenove and Partners Capital have successfully handled our portfolio in the challenging market environment of 2020 with our investments having a final valuation (after withdrawal of £1.0M for the prize Fellowships and Lister operations) of £44.86M, up from £43.2M at the end of 2019. The FIC will continue to monitor closely our portfolio and there will continue to be careful consideration of the numbers and levels of Fellowships and studentships.

All expenditure has been in line with or below the agreed 2020 budget. Spending on Prizes has been lower as only four prizes were awarded, and fewer studentships went ahead because labs were closed. Operational costs were also reduced as a result of not holding the Annual Meeting and holding most of the Governing Body and Committee meetings on-line. The investment managers'

fees were £237K, down slightly from £245K in 2019. With four Fellowships being awarded at £250,000K each, £30K from a prize that had ended being returned, £22K spent on studentships and operational costs being £173K the total expenditure for the Lister institute in 2020 was £1.401M

	£k
Prize Fellowships and studentships	992
Investment managers fees	237
Staff and operational costs	172
TOTAL	1,401

The Lister institute is extremely indebted to our all the members of the Finance and Investment Committee and I would like to thank them all for their scrutiny of the Institute's finances and the rigorous questioning of our current investment advisors, Partners Capital LLP and Cazenove Capital Management. We are particularly grateful to Michael French for his many years as Treasurer and chair of the FIC.

Alex Markham, Chairman

CURRENT LISTER PRIZE FELLOWS

For the full list of all Lister Fellows (past and present) please see the Lister website
<https://www.lister-institute.org.uk/former-fellows/>

Fellow	Title of Research	Awarded
Dr Cynthia Andoniadou King's College London	Regulation of stem cell potential in the mammalian pituitary gland	2016
Dr Tom Baden University of Sussex	Anisotropic retinal circuits for processing of colour and space in nature	2018
Dr Tim Blower Durham University	BREX and phage-bacteria interactions	2019
Dr Ross Chapman University of Oxford	DNA double-strand break repair mechanisms in immunity and oncogenesis	2019
Dr Rebecca Corrigan University of Sheffield	Analysis of the role of (p)ppGpp in staphylococcal infection using zebrafish as a model organism	2018
Professor Victoria Cowling University of Dundee	Regulation and function of the 7-methylguanosine cap	2011
Dr Mark Dodding University of Bristol	A new chemical biology approach to target molecular motors for the manipulation of cytoskeleton and organelle dynamics	2018
Professor Sherif El-Khamisy University of Sheffield	The repair of oxidative and topoisomerase induced chromosomal strand breaks and human disease	2013
Dr Agnieszka Gambus University of Birmingham	Identification and characterisation of Mcm7 ubiquitin ligase	2015
Dr Susana Godinho Queen Mary University of London	Regulation of paracrine signalling by centrosome amplification	2016
Dr Sebastian Guettler The Institute of Cancer Research	Structural basis and mechanism of telomere maintenance by poly(ADP-ribose)ylation	2017
Professor Muzlifah Haniffa Newcastle University	In vivo kinetics and functional response of human mononuclear phagocytes during acute tissue inflammation	2016
Dr Sophie Helaine Imperial College London Harvard Medical School	Salmonella Persister formation at the single cell level	2017
Dr Matthew Hepworth University of Manchester	Targeting cell metabolism to regulate innate lymphoid cells in health and disease	2018
Dr Ragnhildur Thora Karadottir University of Cambridge	The role of neuronal activity in myelin repair	2015
Dr Joanne Konkol University of Manchester	Atypical monocytes at the oral mucosa; revisiting myeloid cell development and function at a unique barrier site	2019
Dr Yogesh Kulathu University of Dundee	Regulation and function of protein FUBylation	2017

Fellow	Title of Research	Awarded
Dr Rebecca Lawson University of Cambridge	Computational neurodevelopment: a new framework for understanding autism spectrum disorder	2020
Dr Michelle Linterman Babraham Institute	Tertiary lymphoid structures in health and disease	2019
Dr Yanlan Mao University College London	Mechanochemical regulation of tissue growth and morphogenesis	2018
Dr Joseph Marsh University of Edinburgh	The dominant-negative effect in protein complexes: implications for human genetic disease	2018
Dr Will McEwan University of Cambridge	Protein-level knockdown as a new frontier for biological and biomedical sciences	2019
Dr Serge Mostowy London School of Hygiene & Tropical Medicine	Bacterial autophagy and the cytoskeleton in host defence	2015
Professor Haniffa Muzlifah University of Newcastle	<i>In vivo</i> kinetics and functional response of human mononuclear phagocytes during acute tissue inflammation	2016
Dr James Nathan University of Cambridge	The interplay between metabolism and oxygen sensing	2017
Professor Jan Rehwinkel University of Oxford	Z-RNA and Z-DNA: Novel inducers of antiviral immunity	2016
Dr Rahul Roychoudhuri University of Cambridge	Resolving mechanisms of gene regulation within the immune system using forward genetics	2017
Dr Tomás Ryan Trinity College Dublin	Gone or Misplaced? – Retrieving Infant Memories in Adults	2020
Dr Amanda Sferruzzi-Perri University of Cambridge	Biomarkers of materno-fetal health: role of placental endocrine mediators in normal and obese pregnancies	2018
Dr Hayley Sharpe Babraham Institute	Receptor tyrosine phosphatase signalling mechanisms in health and disease	2020
Professor Daniel Smith University of Glasgow	Investigating the overlap between hypertension and bipolar disorder to identify new and repurposed medications for bipolar disorder	2016
Dr Stephan Uphoff University of Oxford	Resolving oxidative stress response mechanisms in bacteria during infection and antibiotic treatment	2020
Dr Erica Watson University of Cambridge	Mechanisms of folate metabolism during the trans-generational inheritance of disease	2015
Professor Steven West University of Exeter	The nature, mechanism and function of RNA polymerase II modifications in health and disease	2015

REPORT OF THE GOVERNING BODY

for the year ended 31 December 2020

The Governing Body presents its Annual Report under the Charities Act 2011 together with the audited Financial Statements of the Charity for the year ended 31 December 2020. The Financial Statements have been prepared in accordance with the accounting policies set out in Note 1 (page 25) to the Financial Statements and comply with the Companies Act 2006, the FRS102 Charities SORP and the documents governing the constitution of the Charity

LEGAL AND ADMINISTRATIVE DETAILS

Legal and administrative information is set out on page 33 of this report.

Members of the Governing Body, Directors and Trustees

The members of the Governing Body are, for the purposes of company law, Directors of the Institute and, for the purposes of charity law, Trustees of the Institute and throughout this report are collectively referred to as the Trustees.

Details of the Trustees serving throughout the year are set out on page 33.

STRUCTURE, GOVERNANCE AND MANAGEMENT

Constitution

The Institute is registered with the Charity Commission for England and Wales (registration number 206271). It is incorporated and registered in England and Wales under the Companies Act 2006 as a company limited by guarantee and not having a share capital (company number 34479). It is governed by its Articles of Association and has charitable status.

Appointment and Re-appointment of Trustees

The Trustees are the fourteen members of the Governing Body of whom six are elected by the members at the annual general meeting. A maximum of six further Trustees are appointed by the Governing Body and there are currently five such appointees. One additional member is Lord Iveagh's representative, another is Professor Sir Alec Jeffreys who was appointed to life-membership, and the final member, Professor Douglas Higgs, is the representative of the Royal Society. Trustees, other than the two nominated representatives, Professor Sir Alec Jeffreys and exceptionally those appointed by the Governing Body, generally serve for a period of six years and a system of planned rotation is in place. When considering appointment or nomination for election as Trustees, the Governing Body has regard to the specialist skills needed.

Induction and Training of Trustees

New Trustees undergo induction sessions with the Chairman, Treasurer and Director during which they will gain an understanding of the Institute's structure, activities, financial position and future strategies. Prior to appointment they will

attend one meeting of the Governing Body as 'observers'. New Trustees will also be made aware of their legal obligations with regard to charity and company law. In addition, new Trustees will be advised of appropriate literature and training courses. An Induction check list has been put in place.

Organisation

The Institute is governed by its Governing Body which is responsible for setting policies, authorising actions on all significant operational issues and ensuring legality and good practice. The Governing Body meets formally twice a year. The Treasurer and Chairman review the remuneration of all staff once a year. This includes the remuneration of those individuals considered to be key management personnel.

Specific authorities are delegated to two sub-Committees in particular areas. The Scientific Advisory Committee (see page 33 for membership) has responsibility for identifying the Lister Institute Prize Fellows and the monitoring of their scientific activities, as well as providing scientific and medical advice to the Governing Body as required. In 2020 the Association of Medical Research Charities undertook its quinquennial review of our peer review processes. We will be addressing the few areas highlighted that we might improve to further strengthen our review and award process. The Finance and Investment Committee (see page 33 for membership) has responsibility for interaction with the Institute's investment advisors, ensuring implementation of the Institute's investment policy and monitoring performance. It prepares and submits to the Governing Body the annual budget, and subsequently monitors performance against it. It also advises the Governing Body, as required, on other financial and risk matters.

The routine management of the Institute's activities is undertaken by its Director, aided by the Operations Manager and the Accountant. All staff work from home.

In 2020, none of the Charity's Trustees received any remuneration. Of the trustees only the chairman of the SAC is offered any remuneration or any other benefits in relation to their dealings with the Charity. The chair of the SAC, who is also a member of the Governing Body, is offered an honorarium in recognition of the very significant workload associated with the role. In 2020 the honorarium was paid to the chairman's employer, the University of Bristol.

The Chairman and the Treasurer of the Charity agree the Director's remuneration which, along with other Lister Institute staff, is normally increased in line with RPI. Salaries are also compared to similar organisations and adjusted periodically where appropriate.

Risk Management

The Trustees assess the risks facing the Institute and review the effectiveness of the controls to monitor and mitigate them. A Risk Management Register is maintained and formally reviewed annually by the Governing Body.

The key controls used by the Institute include:

- Formal agendas for all Governing Body meetings
- Strategic planning, budgeting and management accounting
- Formal written policies
- Clear authorisation and approval levels
- Regular review of Fellows' scientific reports

The risk of cyber-attack was considered by the Trustees and amendments were made to the risk log. A cyber-security policy is being developed.

The specific risk of bribery associated with any of the Institute's activities has been previously reviewed, and clear policies and procedures have been developed and communicated to all Trustees, staff and Members.

The specific risk of scientific misconduct by Lister Fellows was previously reviewed by the Trustees and, as a result, minor amendments were made to the risk log.

The Lister website and terms and conditions have been updated in response to the 2018 EU General Data Protection Regulation (GDPR). All staff have undertaken GDPR training and further documentation is being developed to further support compliance.

The Institute maintains a 'Register of Interests' for all Governing Body and committee members as well as principal staff and operates a clear "declaration of interests" policy and procedures for all meetings.

The principal risk facing the Institute lies in its ability to maintain and protect the value in real terms of its investments and to generate from them, on a long-term basis, a consistently high overall return. This risk is mitigated by the Institute's appointment of experienced investment managers with a proven track record; by internal controls that allow close and regular monitoring of their performance against benchmarks; by the Institute's requirement of its investment managers to re-tender periodically and competitively for appointment – as happened in 2017 and is planned for 2022; and by regular meetings that formally review investment performance and policy, and include one-to-one presentations by the investment managers.

Investment Policy Statements are in place for the Lister Institute and its investment partners. These are reviewed on an annual basis.

Objectives and Activities

The statutory Object of the Institute is to further the understanding and progress in preventive medicine by promoting excellence in biomedical research in the UK and Ireland.

When founded in 1891, the Institute sought to achieve this objective by establishing a research institute specialising in the area of "infections" and their prevention by immunisation and other means. It complemented these research activities by the production and supply of materials such as vaccines and anti-toxins.

The Institute continued in this mode until the late 1970s when increasing financial and regulatory pressures caused the cessation of these activities. Proceeds from the resultant sale of land and buildings created the investment funds from which present-day activities are financed; at 31 December 2020 these funds stood at £44.86M. From the 1980s the Institute has pursued its objective of nurturing future leaders by the provision of grant funding to facilitate the research and careers of high-quality individuals working in areas of biomedicine relevant to preventive medicine. It has done this because it believes that the acquisition and advancement of knowledge is crucial to the understanding of health and disease and that research to achieve this is driven forward by high quality individuals and their supporting staff.

Principal Activities

In pursuance of this objective, during 2020 the Institute awarded four new Prize Fellowships. In addition, the Institute has continued its Summer Studentship scheme. Generally, this has enabled an increasing number of undergraduates per year to work with Lister Institute Fellows or former Fellows in order to gain experience of biomedical research with the hope that they might consider it as a career. In 2020, because of Covid restrictions only a small number of studentships could go ahead.

Achievement and Performance

The Scientific Advisory Committee has monitored the performance of the current 33 Lister Institute Prize Fellows, through detailed review of the annual reports on their research that include details of all publications and presentations. The Scientific Advisory Committee has reported to Trustees that it is of the view that all Fellows are undertaking high quality research and producing new knowledge that will contribute significantly to our understanding of disease, its causes, treatment and prevention. The reports of the research undertaken by the Summer Students have also been reviewed and found to be satisfactory.

Four Lister Institute Prize Fellowships were awarded in 2020 to Dr Rebecca Lawson, Dr Tomás Ryan, Dr Haley Sharpe and Dr Stephan Uphoff from an initial field of 114 applicants, following extensive scientific review of their applications and final interview by the Scientific Advisory Committee. (More details of the Prize Fellows and their research are provided on pages 2 and 3). Each Prize Fellowship provides £250k with all the funds provided to the host institution at the commencement of the award. Normally Lister Prize Fellowships may be spent over five years on the recipient's research, however in 2020 they were awarded for 6 years to allow for the early limitations and likely slow start caused by the pandemic.

Forty Summer Studentships were awarded in 2020, however only nine went ahead due to covid restrictions. Each is a £2,350 student bursary and is paid to the host institution at the commencement of the award for the support of the student

REPORT OF THE GOVERNING BODY (CONTINUED)

for up to a ten-week period. We are pleased that despite the challenges of the pandemic we were still able to support these studentships.

Public Benefit

The statutory objectives, aims and activities of The Lister Institute of Preventive Medicine are to further understanding in preventive medicine by promoting biomedical research, as set out on page 19 of this Report. The Trustees have considered the Charity Commission's guidance on public benefit, including the guidance 'public benefit: running a charity (PB2)'.

The public benefit of the Institute's grant-making is clearly identifiable in the 'Achievement and Performance' paragraphs above and in the list of Research Prize Fellows together with their areas of research on pages 16 to 17. All Lister Institute Fellows are actively encouraged, where appropriate, to develop their research findings for potential public benefit and the Scientific Advisory Committee has regard to this when reviewing their research reports. The Lister Institute therefore benefits the public or a sector of it without imposing any restrictions. Applications from individuals are accepted only when demonstrably consistent with the charitable objectives of the Institute.

Impact

The impact of the activities of a medical research charity can be measured at many levels ranging from the growth of knowledge to direct patient/public benefit. Often the transition from the former to the latter may take many years and the involvement of several organisations. The Institute requires that the results of the research it supports are published and disseminated; that, where appropriate, significant intellectual property is protected via patents; and that its commercial development is encouraged. Several biotechnology companies have been formed around the findings of Institute-funded research and there are several interactions with large pharmaceutical companies. A prime example of the impact of Lister Institute research is DNA fingerprinting, which was discovered by Sir Alec Jeffreys when a Lister Institute Fellow, and has become an integral part of society, helping to prove innocence or guilt in criminal cases, resolving immigration arguments and clarifying paternity.

Investment Policy and Performance

The Institute's investment objective is to develop and maintain its financial resources in real terms through the selection of investments, consistent with an acceptable level of risk.

The Institute's investment portfolio is split between Cazenove Capital Management and Partners Capital LLP who both operate under mandates agreed in advance with the Finance and Investment Committee. These mandates set out an overall target asset allocation with allowable ranges for each category of asset.

Both investment managers invest on a total returns basis through a variety of pooled funds and in accordance with the Institute's overarching "Investment Policy Statement" ("IPS"), which states the overall investment objective and sets the investment return objectives, the risk parameters, the performance measures and review procedures for the portfolio. The Institute's IPS was reviewed and revised in 2020. Specific versions were also agreed for each of the investment managers to reflect their individual investment approaches. The IPS's are reviewed annually. The investment managers are informed at the beginning of the financial year of the Institute's likely cash requirements, both in terms of the amount and the timing of any draw-down and are asked to keep in an income or cash account sufficient funds to meet them. The Institute has in place an ethical investment policy which does not permit direct investment in tobacco or tobacco-related companies.

The Institute's overall financial return objective is to preserve and, if possible, enhance the purchasing power of its portfolio assets, net of costs and approved withdrawals, over rolling five-year periods. This goal is synonymous with the pursuit of a time-weighted net return on portfolio assets that equals and, if possible, exceeds cost inflation as measured by the UK Consumer Price Index plus the Institute's long-term spending rate of 3-4% measured over corresponding five-year periods. This goal has been achieved over the previous five-year period.

The performance of the investment portfolio is reviewed by the Finance and Investment Committee, which held two meetings in the year with the investment advisors to review performance, liquidity within the portfolio etc. In addition, the Institute receives detailed quarterly valuation and transaction reports. In a year that saw significant volatility in the market the fund has still grown from £43.23m to £44.86m. A decision, taken in 2015 (and ratified in subsequent years), to withdraw and place £5m in a Liquidity Account was based both on the recent strong growth of the portfolio but also concerns about future market volatility and performance. Given the increase in the number and level of the Fellowships a further discussion was held in 2020 and the decision was made to maintain £5m in this Account, on a rolling basis, to be reviewed annually. This decision will ensure that six Prize Fellowships of £250k each can be awarded for at least three years from 2021. With the significant fluctuations in markets triggered by the Covid-19 pandemic, for the first time, serious consideration was given to using this Liquidity Account to finance 2020's prizes and activities. In the end, however, it was decided not to do this and 2020 activities were funded as normal through the main portfolio.

More details of the Institute's activities are set out in the Chairman's Report on pages 1 to 15.

FINANCIAL REVIEW

Allocation of Resources

The Institute, which does not seek to raise funds from the public, depends primarily on investment returns to meet its pension provision payments, administrative expenditure and expenditure in furtherance of the Charity's objectives. The total return on investments for the year was a net gain of £2.28m and investment income of £580K.

The resources expended totalled £1.388m of which £1.151m were resources expended for the Institute's charitable activities.

The Prize Fellowships are fixed sum awards and, therefore, expenditure can be regulated by altering the number and/or value of prizes awarded each year. In 2020, prizes were awarded to four very strong candidates. As previously described, a £5m liquid portfolio has been established so that the number and level of awards is sustainable over a minimum of three years. Nine studentships were awarded in 2020.

Payments are currently made to three pensioners who are previous employees of the Lister Institute. The Institute's unfunded pension liability, as last disclosed, is some £143,000. Given the value and nature of our investments, we do not believe pension funding to be a concern.

Reserves Policy

The policy of the Trustees is to maintain adequate financial resources to provide income to meet current and future commitments as they fall due and ensure that adequate funds remain available to enable them to make awards in perpetuity.

The adequacy of the level of reserves (£44.79m at the end of 2020) and the continuing appropriateness of the policy are reviewed on an annual basis by the Trustees. They continue to endorse the policy and its ability to support the long-term viability of the Institute and, given that the Institute is not formally committed to awarding any Prizes beyond the current year, are confident in the ability of the Institute to maintain appropriate levels of activity in the short-term.

Plans for the Future

The Institute's future policy is to continue to pursue its current objectives. It will therefore maintain and look to increase the Prize Fellowship scheme, which it sees as a funding priority. The Summer Studentship scheme will also be increased when possible.

Trustee Responsibilities Statement

The Trustees (who are also directors of The Lister Institute of Preventive Medicine for the purposes of company law) are responsible for preparing the Trustees' Annual Report and the financial statements in accordance with applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice).

Company law requires the Trustees to prepare financial statements for each financial year, which give a true and fair

view of the state of affairs of the charitable company, and of the incoming resources and application of resources, including the income and expenditure, of the charitable company for that period. In preparing these financial statements, the Trustees are required to:

- select suitable accounting policies and then apply them consistently;
- observe the methods and principles in the Charities SORP;
- make judgments and estimates that are reasonable and prudent;
- state whether applicable UK Accounting Standards have been followed, subject to any material departures disclosed and explained in the financial statements; and
- prepare the financial statements on the going concern basis, unless it is inappropriate to presume that the charitable company will continue in business.

The Trustees are responsible for keeping proper accounting records that disclose with reasonable accuracy at any time the financial position of the charitable company and enable them to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the charitable company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

In so far as the Trustees are aware:

- there is no relevant audit information of which the charitable company's auditor is unaware; and
- the Trustees have taken all steps that they ought to have taken to make themselves aware of any relevant audit information and to establish that the auditor is aware of that information.

The Trustees are responsible for the maintenance and integrity of the corporate and financial information included on the charitable company's website. Legislation in the United Kingdom governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

This Trustees' report has been prepared in accordance with the special provisions of Part 15 of the Companies Act 2006 relating to small companies.

By Order of the Governing Body

SIR ALEXANDER F MARKHAM
Chairman

MURRAY LEGG
Treasurer

5 May 2021

STATEMENT OF FINANCIAL ACTIVITIES

for the year ended 31 December 2020

	Notes	2020	2019
		£'000	£'000
Income from:			
Investments	2	580	840
Other	3	13	6
Total income		593	846
Expenditure on:			
Cost of raising funds			
Investment management costs	4	(237)	(245)
Charitable Activities			
Prizes and Summer Studentships	6	(1,152)	(1,538)
Total expenditure		(1,389)	(1,783)
Net gains on investments	9	2,282	3,579
Net income		1,486	2,642
Other recognised losses:			
Actuarial losses on defined benefit schemes	13	(13)	(8)
Net movement in funds		1,473	2,634
Reconciliation of funds:			
Total funds brought forward		43,321	40,687
Total funds carried forward		44,794	43,321

All items in the above Statement of Financial Activities relate to continuing operations for both years. The Institute has no other recognised gains and losses other than as stated above and hence no separate income and expenditure statement has been shown.

The notes set out on pages 25 to 30 form part of these financial statements.

BALANCE SHEET

as at 31 December 2020 Company no: 34479

	Notes	2020	2019
		£'000	£'000
Fixed assets:			
Investments	9	44,858	43,226
Total fixed assets		44,858	43,226
Current assets:			
Debtors	10	26	8
Cash at bank and in hand	11	132	303
Total current assets		158	311
Current liabilities:			
Creditors: amounts falling due within one year	12	(88)	(73)
Net current assets		70	238
Total assets less current liabilities		44,928	43,464
Creditors: amounts falling due after more than one year			
Pension provision	13	(134)	(143)
Net assets		44,794	43,321
Represented by			
Unrestricted funds		44,794	43,321
Total charity funds		44,794	43,321

The Trustees have taken advantage of the exemptions conferred by the Companies Act 2006, on the grounds that the Institute is entitled to the benefit of those exemptions as a small company.

These financial statements were approved by the Governing Body on 5 May 2021

ALEXANDER F MARKHAM
MURRAY LEGG
 Members of the Governing Body

The notes set out on pages 25 to 30 form part of these financial statements.

CASH FLOW STATEMENT

for the year ended 31 December 2020

	2020	2019
	£'000	£'000
Cash flow/(outflow) from operating activities		
Net cash used in operating activities	(1,401)	(1,783)
Cash flows from investing activities		
Investment income	580	840
Proceeds from disposal of fixed asset investments	13,572	11,280
Acquisition of fixed asset investments	(12,790)	(9,366)
Other movements on investments	(132)	(737)
	(171)	234
Net (decrease)/increase in cash	(171)	234
Cash and cash equivalents at beginning of year	303	69
Cash and cash equivalents at end of year	132	303
Reconciliation of net income to net cash flow from operating activities		
	2020	2019
	£'000	£'000
Net income	1,473	2,634
Adjustments for		
Net gains on investments	(2,282)	(3,579)
Investment Income	(580)	(840)
(Increase)/decrease in debtors	(18)	3
Increase in creditors	15	11
Decrease in pensions	(9)	(12)
Net cash used in operating activities	(1,401)	(1,783)

NOTES TO THE FINANCIAL STATEMENTS

for the year ended 31 December 2020

1 PRINCIPAL ACCOUNTING POLICIES

Basis of preparation

The Financial Statements have been prepared in accordance with the Statement of Recommended Practice, Accounting and Reporting by Charities (FRS102 SORP). The Financial Statements are prepared in accordance with the historical cost convention modified by the revaluation of investments. The charity is a Public Benefit Entity as defined by FRS102.

The Financial Statements are prepared in sterling which is the functional currency of the Charity. Monetary amounts in these Financial Statements are rounded to the nearest thousand pounds.

The principal accounting policies adopted in the preparation of the Financial Statements are as follows:

Income

All incoming resources are accounted for on a receivable basis.

Prizes and summer studentships

The cost of Research Prize Fellowships is charged in the year awarded.

Expenditure

The costs of raising funds include those fees payable to the Institute's investment fund managers for the management of the Institute's investment portfolio. These are accounted for on an accruals basis.

Charitable activities comprise all expenditure directly relating to the objects of the charity and are accounted for on an accruals basis. The allocation of expenditure between governance and management, administration and support costs is reviewed on an annual basis to ensure the allocation is appropriate. Indirect costs are generally treated as falling into the latter category with the exception of a proportion of salary and related costs, which have been classified as governance costs.

In addition to auditor's remuneration, governance costs comprise the proportion of staff costs associated with the time spent on the preparation of the statutory accounts and other governance issues, together with honoraria remuneration provided to members of the Institute's Scientific Advisory Committee for their duties in selecting the Prize Fellows.

Supplementary pensions and staff pensions

An estimate of the full provision is made in the Financial Statements for the costs of future supplementary payments. The provision and charge to income are reviewed annually by the Trustees in the knowledge that the number of persons receiving the supplementary pensions will not increase. The pension costs are assessed in accordance with actuarial advice and these costs are accounted for in accordance with FRS102 SORP.

Existing employees participate in a defined contribution scheme, the costs of which are expensed as incurred. These disclosures are made in accordance with FRS102 SORP.

Tangible fixed assets

Any capital items purchased under £1k in value are expensed in the accounts in full as incurred. The Charity has no tangible fixed assets.

Investments

Investments are shown at market value in the balance sheet. Changes in the market value are included in the Statement of Financial Activities as realised and unrealised investment gains or losses in the year in which they arise. Investments denominated in foreign currencies are valued at year-end rates of exchange.

Cash flow statement

The Charity has included a cash flow statement in accordance with FRS102 SORP.

Taxation

The organisation is a registered charity and has obtained exemptions from taxation under Part 11, Chapter 3 of the Corporation Tax Act 2010. This exemption will remain as long as income is compatible with that section and expenditure is applied to charitable purposes only.

Critical accounting estimates and areas of judgement

In preparing financial statements it is necessary to make certain judgements, estimates and assumptions that affect the amounts recognised in the financial statements. The Trustees consider the estimates involved in the valuation of investments to have most significant effect on amounts recognised in the financial statements. These are taken directly from Investment Manager's reports.

In addition, the company has an obligation to pay pension benefits to certain employees. The cost of these benefits and the present value of the obligation depend on a number of factors including: life expectancy, salary increases, asset valuations and the discount rate on corporate bonds. Management estimates these factors in determining the net pension obligation in the balance sheet. The assumptions reflect historical experience and current trends. See Note 13 for the disclosures relating to the defined benefit pension scheme.

Going concern

The Trustees have assessed whether the use of the going concern basis is appropriate and have considered possible events or conditions that might cast significant doubt on the ability of the charity to continue as a going concern. The Trustees have made this assessment for a period of at least one year from the date of approval of the financial statements.

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

1 PRINCIPAL ACCOUNTING POLICIES *continued*

In making this assessment the Trustees have considered the impact of the Covid 19 pandemic, are satisfied that the substantial reserves and liquid assets held by the Lister Institute justify their belief that there are no material uncertainties that cast significant doubt on the charity's ability to continue as a going concern. The charity therefore continues to adopt the going concern basis in preparing its financial statements.

Financial instruments

The company has elected to apply the provisions of Section 11 'Basic Financial Instruments' and Section 12 'Other Financial Instruments Issues' of FRS 102 to all of its financial instruments. Financial instruments are recognised in the company's balance sheet when the company becomes party to the contractual provisions of the instrument. Financial assets and liabilities

are offset, with the net amounts presented in the financial statements, when there is a legally enforceable right to set off the recognised amounts and there is an intention to settle on a net basis or to realise the asset and settle the liability simultaneously.

With the exceptions of prepayments and deferred income all other debtor and creditor balances are considered to be basic financial instruments under FRS 102. See notes 10 and 12 for the debtor and creditor notes.

Fund accounting

Restricted funds are funds available subject to specific restrictions imposed by donors.

2 INVESTMENT INCOME

	2020	2019
	£'000	£'000
Income from fixed asset investments	579	839
Bank interest receivable	1	1
	580	840

3 OTHER INCOME

	2020	2019
	£'000	£'000
Royalty income CRT Ltd	13	6
Total other income	13	6

Royalty income is earned from Cancer Research Technology as a result of Revenue sharing related to Glover research studies £13k (2019: £6k).

4 INVESTMENT MANAGEMENT COSTS

	2020	2019
	£'000	£'000
Partners Capital LLP	146	154
Cazenove Capital Management	91	91
Total investment management fees	237	245

Investment management fees referred to here are those accrued fees relating to the management of the Institute's investment portfolios in 2020.

5 GOVERNING BODY AND STAFF COSTS

Emoluments of members of the Governing Body

No member of the Governing Body received any emoluments in respect of services to the Institute during the year (2019: nil). Travel expenses of £411 were paid relating to the claims of one member in connection with their attendance at meetings (2019: £2,151 eight members).

Members of the Scientific Advisory Committee (the chair of which is also a member of the Governing Body) are offered remuneration in relation to their services to the committee. An honorarium of £2,000 (2019: £2,000) was paid to the employing institution of the chair of the SAC, the other SAC members (none of whom are members of the Governing Body) were paid £1,000 (2019: £1,000). The vast majority of members asked for the honorarium to be paid to their employing institution.

Employee information

The average number of persons employed by the Institute during the year was 4, (2019: 3.6) three of whom are part-time (2019: 2). All staff were employed in an administrative and support capacity. No employees earn over £60,000 p.a. (2019: none). Key management personnel include the Trustees and the Director. The total employee benefits of the charity's key management personnel were £40,228 (2019: £59,344).

Staff costs	2020	2019
	£'000	£'000
Gross salaries	99	108
Pension contributions	4	4
Employer's national insurance	6	8
	109	120

The salary costs are allocated under governance where related to statutory accounts preparation, the balance being reported within charitable activities.

6 PRIZES & SUMMER STUDENTSHIPS

	2020	2019
	£'000	£'000
Prize awards	970	1,250
Summer studentship payments	22	80
Support costs (see note 7)	37	67
Salaries (see note 5)	96	105
Governance costs (see note 8)	27	36
	1,152	1,538

7 SUPPORT COSTS

	2020	2019
	£'000	£'000
Office expenses	12	19
Travel expenses	1	3
Professional fees	9	8
Honoraria and events	11	29
Pension costs (see note 13)	4	8
	37	67

These costs are all considered to be costs to support resources expended on charitable activities.

NOTES TO THE FINANCIAL STATEMENTS
(CONTINUED)

8 GOVERNANCE COSTS

	2020	2019
	£'000	£'000
Auditor's remuneration - current year	11	11
Staff costs (see Note 5)	14	15
Honoraria and events	2	10
Total	27	36

No non-audit services were provided by the auditors during the year (2019: none).
Auditors remuneration includes irrecoverable VAT.

9 INVESTMENTS

Listed investments are valued at middle market quotations ruling at the year-end

	2020	2019
	£'000	£'000
Market value at beginning of year	43,226	40,824
Purchases during the year at cost	12,790	9,366
Proceeds of sales during the year	(13,572)	(11,280)
Reinvested income for the year	474	681
Movement in un-invested cash	658	1,806
Cash withdrawn	(1,000)	(1,750)
Net change in market value	2,282	3,579
Market value at year-end	44,858	43,226

The portfolio's asset allocation was as follows

UK investments

	2020	2019
Equities	3,265	5,319
Fixed interest	3,591	3,613
Other (including private equity, property, commodities, alternatives and inflation linked bonds)	5,599	5,765
Cash	5,207	3,748
Total UK investments	17,662	18,445

Non-UK investments

	2020	2019
Equities	22,652	18,678
Other (including private equity, property, commodities and alternatives)	4,544	5,054
Cash	0	1,049
Total Non-UK investments	27,196	24,781
Total	44,858	43,226

At 31 December 2020 no single shareholding exceeded 5% of the total value of investments (2019: none).
Historical cost related to the closing position of 2020 was £35.52m (2019: £34.47m).

The Institute's investments held by one custodian are charged as security for the Institute's ongoing financial obligations to that custodian for banking services related to those investments.

10 DEBTORS

	2020	2019
	£'000	£'000
Prepayments	13	2
Accrued income	13	6
Total	26	8

11 CASH

	2020	2019
	£'000	£'000
Cash at bank	132	303

12 CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR

	2020	2019
	£'000	£'000
Taxation and social security	4	4
Accruals	84	69
Total creditors falling due within one year	88	73

13 PROVISION FOR LIABILITIES AND CHARGES

This represents a provision for future supplementary pension payments in respect of ex-employees, based on their salary and length of service. The pensions are unfunded, with payments made out of the Institute's funds as they fall due.

Movements in the pension provision during the year were as below

	2020	2019
	£'000	£'000
Liability at beginning of period	143	155
Plus interest cost	4	8
Plus actuarial gains and losses	13	8
Benefits paid	(26)	(28)
Liability at end of period	134	143

The tables below state the FRS102 actuarial assumptions used to estimate the pension provision.

Principal actuarial assumptions Valuation at 31 December 2020

	2020	2019
Rate of increase to pensions in payment	3.0%	3.0%
Rate used to discount scheme liabilities	2.5%	5.0%

The post-retirement mortality assumption uses the PCA00 base tables (year of birth) with improvements equal to medium cohort with a 1% minimum.

14 RELATED PARTY TRANSACTIONS

There were no related party transactions in the year, other than those outlined in note 5 (2019: none).

15 FINANCIAL INSTRUMENTS

	2020	2019
	£'000	£'000
Carrying amount of financial asset debt instrument at amortised cost	13	6
Carrying amount of financial liabilities measured at amortised cost	84	69

16 MEMBERS' LIABILITY

The liability of the Members of the institute is limited to 50p. At the date of the financial statements, there were 217 (2019: 205), each with a guarantee potential of 50p.

INDEPENDENT AUDITOR'S REPORT to the Members of the Lister Institute of Preventive Medicine

Opinion

We have audited the financial statements of The Lister Institute of Preventive Medicine ('the company') for the year ended 31 December 2020 which comprise the Statement of Financial Activities, the Balance Sheet, the Cash Flow Statement and notes to the financial statements, including a summary of significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including FRS 102 'The Financial Reporting Standard Applicable in the UK and Republic of Ireland' (United Kingdom Generally Accepted Accounting Practice).

In our opinion the financial statements:

- give a true and fair view of the state of the charitable company's affairs as at 31 December 2020 and of its incoming resources and application of resources, including its income and expenditure, for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs(UK)) and applicable law. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the audit of the financial statements section of our report. We are independent of the charitable company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard, and we have fulfilled

our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Conclusions relating to going concern

In auditing the financial statements, we have concluded that the trustees' use of the going concern basis of accounting in the preparation of the financial statements is appropriate.

Based on the work we have performed, we have not identified any material uncertainties relating to events or conditions that, individually or collectively, may cast significant doubt on the charitable company's ability to continue as a going concern for a period of at least twelve months from when the financial statements are authorised for issue.

Our responsibilities and the responsibilities of the trustees with respect to going concern are described in the relevant sections of this report.

Other information

The other information comprises the information included in the annual report, other than the financial statements and our auditor's report thereon. The trustees are responsible for the other information. Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge

obtained in the audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the financial statements or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.

We have nothing to report in this regard.

Opinions on other matters prescribed by the Companies Act 2006

In our opinion, based on the work undertaken in the course of the audit:

- the information given in the trustees' annual report for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- the trustees' annual report have been prepared in accordance with applicable legal requirements.

Matters on which we are required to report by exception

In the light of the knowledge and understanding of the company and its environment obtained in the course of the audit, we have not identified material misstatements in the trustees' annual report.

We have nothing to report in respect of the following matters where the Companies Act 2006 requires us to report to you if, in our opinion:

- adequate accounting records have not been kept, or returns adequate for our audit have not been received from branches not visited by us; or
- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of trustees' remuneration specified by law are not made;
- we have not received all the information and explanations we require for our audit; or
- the trustees were not entitled to prepare the financial statements in accordance with the small companies regime and take advantage of the small companies exemption in preparing the Trustees' Annual Report and from preparing a Strategic Report.

Responsibilities of Trustees

As explained more fully in the trustees' responsibilities statement set out on pages 21, the trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the trustees determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the trustees are responsible for assessing the charitable company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the trustees either intend to liquidate the charitable company or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

Irregularities, including fraud, are instances of non-compliance with laws and regulations. We design procedures in line with our responsibilities, outlined above, to detect material misstatements in respect of irregularities, including fraud. The extent to which our procedures are capable of detecting irregularities, including fraud is detailed below.

Explanation as to what extent the audit was considered capable of detecting irregularities, including fraud

The objectives of our audit in respect of fraud, are; to identify and assess the risks of material misstatement of the financial statements due to fraud; to obtain sufficient appropriate audit evidence regarding the assessed risks of material misstatement due to fraud, through designing and implementing appropriate responses to those assessed risks; and to respond appropriately to instances of fraud or suspected fraud identified during the audit. However, the primary responsibility for the prevention and detection of fraud rests with both management and those charged with governance of the charitable company.

Our approach was as follows:

- We obtained an understanding of the legal and regulatory requirements applicable to the charitable company and considered that the most significant are the Companies Act 2006, the Charities Act 2011, the Charity SORP, and UK financial reporting standards as issued by the Financial Reporting Council.
- We obtained an understanding of how the charitable company complies with these requirements by discussions with management.
- We assessed the risk of material misstatement of the financial statements, including the risk of material misstatement due to fraud and how it might occur, by holding discussions with management.
- We inquired of management and those charged with governance as to any known instances of non-compliance or suspected non-compliance with laws and regulations.
- Based on this understanding, we designed specific appropriate audit procedures to identify instances of non-compliance with laws and regulations. This included making enquiries of management and those charged with governance and obtaining additional corroborative evidence as required.
- In addressing the risk of fraud due to management override of internal controls we tested the appropriateness of journal entries and assessed whether the judgements made in making accounting estimates were indicative of a potential bias.

Due to the inherent limitations of an audit, there is an unavoidable risk that we may not have detected some material misstatements in the financial statements, even though we have properly planned and performed our audit in accordance with auditing standards. For example, as with any audit, there remained a higher risk of non-detection of irregularities, as these may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls. We are not responsible for preventing fraud or non-compliance with laws and regulations and cannot be expected to detect all fraud and non-compliance with laws and regulations

As part of an audit in accordance with ISAs (UK) we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purposes of expressing an opinion on the effectiveness of the charitable company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the trustees.
- Conclude on the appropriateness of the trustees' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the charitable company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements

or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the charitable company to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Use of our report

This report is made solely to the charitable company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to any party other than the charitable company and charitable company's members as a body, for our audit work, for this report, or for the opinions we have formed.

LUKE HOLT (Senior Statutory Auditor)
for and on behalf of Kingston Smith LLP, *Statutory Auditor*

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Date: June 2021

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Mr Michael French, BSc (Eng), FCA, *Hon Treasurer (Retired 4th September 2020)*
Mr Murray Legg, BSc, FCA, *Hon Treasurer (Elected 4th September 2020)*
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Professor Sir Adrian P Bird, CBE, FRS, FRSE
Professor Rebecca Fitzgerald, MD, FRCP, FMedSci
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Professor Douglas Higgs, MBBS, MRCP, DSc, FRCP, FRCPath, FRS
Mr Andrew Hutton, MA, CFA
Professor John Iredale, FRCP, FMedSci, FRSE
Professor Sir Alec J Jeffreys, CH, DPhil, FMedSci, FRS
Mr Stephen McMahon, MA (Oxon), FCA, FCSI
Mr Matthew Pintus, BA
Professor Dame Pamela Shaw, DBE, FRCP, FMedSci

THE SCIENTIFIC ADVISORY COMMITTEE

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Professor Julian Blow, PhD, FRSE, FMedSci
Professor Cyrus Cooper, OBE, MA, DM, FRCP, FFPH, FMedSci
Professor Aroon Hingorani, MA, PhD, FRCP
Professor Kikkeri K Naresh, MBBS, MD, DCP, FRCPath, (*Appointed 4th September 2020*)
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Professor Elizabeth Patton, BSc, PhD, FRSE
Professor Barry V L Potter, MA, DPhil, DSc, CSci, FRSC, FMedSci
Professor Fiona Powrie, FRS FMedSci
Professor Christoph M Tang, MBChB, PhD, FMedSci
Professor Magdalena Zernicka-Goetz, MSc, PhD

THE FINANCE AND INVESTMENT COMMITTEE

Mr Michael French, BSc (Eng), FCA, *Hon Treasurer (Retired 4th September 2020)*
Mr Murray Legg, BSc, FCA, *Hon Treasurer (Elected 4th September 2020)*
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Mr Andrew Hutton, MA, CFA
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Mr Matthew Pintus, BA

SENIOR MANAGEMENT

Director and Secretary: Dr Sally Burtles, BSc, PhD

