# Summer School 2022

## From ageing hallmarks to drugs for age-related diseases: steps in the discovery pipeline

## Oriel College, Oxford

## 22nd to 25th August 2022

# Table of Contents

# Programme

The programme is designed to take you from the basic biology of ageing processes via the latest tools in target identification and screening, through to drug discovery and clinical trials. The summer school is designed to provide an opportunity for genuine networking as well as skills training, and in addition we hope to publish outcomes from the summer school in peer reviewed journals, supporting your career progression.

## Day 1 – Monday 22nd August 2022

| Time | | Tutor | Location |
|---|---|---|---|
| 9:00 | Registration | | Oriel Lodge |
| 10:30 | Refreshments | | Oriel HSR |
| 11:00 | Introduction and Goal Setting | Lynne Cox | Oriel HLT |
| | Ageing processes and hallmarks | | |
| 11:30 | Ageing, Multimorbidity and the Geroscience Hypothesis | Lynne Cox | Oriel HLT |
| 12:00 | Ageing Hallmarks | Richard Faragher | Oriel HLT |
| 12:30 | Cell senescence as a hallmark and driver of ageing: targeting mTOR alleviates senescence and other hallmarks of ageing | Lynne Cox | Oriel HLT |
| 13:00 | Lunch | | Oriel HSR |
| 14:00 | Key collection & luggage to rooms | | Oriel Lodge |
| 14:30 | Senisca - Targeting Senescence - a Biotech story | Lorna Harries (virtual) | Oriel HLT |
| 15:00 | Designing a screen for drugs to suppress the inflammatory SASP | Lynne Cox | Oriel HLT |
| 15:30 | Refreshment break | | Oriel HSR |
| 16:00 | Immunosenescence: Impact on Health in Old Age | Janet Lord | Oriel HLT |
| 17:00 | Cell Extrinsic Autophagy and Inflammaging | Katja Simon | Oriel HLT |
| 17:30 | Break | | |
| 18:00 | Why ageing is a complex process for drug discovery | Lynne Cox | Oriel HLT |
| | Ageing biomarkers in the literature | | |
| 18:30 | Identifying Biomarkers and Targets – Intro to workshop | Workshop | Oriel HLT |
| 19:00 | Dinner | | |
| 20:30 | Identifying Biomarkers and Targets – Journal Club | BLAST team to moderate | Oriel Beddard and Walker rooms |
| 21:30 | End | | |

## Day 2 – Tuesday 23rd August 2022

| Time | | Tutor | Location |
|---|---|---|---|
| | Tools to identify biomarkers and targets | | |
| 9:00 | Molecular biology tools and methods (1) | Colin McClure | Oriel HLT |
| 9:30 | Molecular biology tools and methods (2) | Colin McClure | Oriel HLT |
| 10:00 | Molecular -omics tools (1) | Lynne Cox | Oriel HLT |
| 10:30 | Refreshment break | | Oriel HSR |
| 11:00 | Molecular -omics tools (2) | Lynne Cox | |
| 11:30 | Understanding the senolytic and senomorphic effects of Zoledronate treatment in an ageing mouse model – use of spatial transcriptomics | Ellie Platt | Oriel HLT |
| 12:00 | Single-cell RNA sequencing: overview and examples of applications | Isar Nassiri | Oriel HLT |
| 12:30 | Lunch | | Oriel HSR |

| | | | |
|---|---|---|---|
| 13:30 | Introduction to basic in silico tools for molecular biology– BLAST, SnapGene etc | Lynne Cox | Broadbent Lab, DCH |
| 13:45 | Hands-on – molecular biology tools | Lynne Cox plus Others | Broadbent Lab, DCH |
| 15:40 | Refreshment break | | LG Atrium, DCH |
| 16:00 | Intro to Galaxy platform | Lynne Cox | Broadbent Lab, DCH |
| 16:10 | Hands On RNASeq analysis | Lynne Cox, Colin McClure plus peer mentors | Broadbent Lab, DCH |
| 17:00 | Break | | |
| 17:30 | Hands On RNASeq analysis | Lynne Cox, Colin McClure plus peer mentors | Broadbent Lab, DCH |
| 18:30 | Return to Oriel | | |
| 19:00 | Dinner | | Oriel Hall |
| | Ageing biomarkers in the literature | | |
| 20:30 | Identifying Biomarkers and Targets – Journal Club | Workshop – BLAST team to moderate | Oriel Beddard and Walker rooms |
| 21:30 | End | | |

## Day 3 – Wednesday 24th August 2022

| Time | | Tutor | Location |
|---|---|---|---|
| | Tools to identify biomarkers and targets | | |
| 9:00 | Hands On – Differential Gene Expression (DGE) Analysis | Lynne Cox, Colin McClure plus Others | Broadbent Lab, DCH |
| 10:30 | Refreshment break | | LG Atrium |
| 11:00 | Finalising DGE | Workshop | Broadbent Lab, DCH |
| 12:00 | Reporting back on DGE findings - Novel Biomarkers | Workshop | Broadbent Lab, DCH |
| 13:00 | Lunch | | Oriel HSR |
| | Drug discovery and clinical trials in ageing | | |
| 14:00 | Drug Discovery 101: From Molecules to Medicines | Kirsty Winn (virtual) | Oriel HLT |
| 14:30 | Drug Discovery for Alzheimer's disease | Evandro Fei Fang | Oriel HLT |
| 15:00 | Refreshment break | | Oriel HSR |
| 15:30 | Ethics and Regulation of Clinical Trials | Karen Melham | Oriel HLT |
| 16:00 | Drug development from discovery to commercialization: Clinical trials and regulations | Simona Reed (virtual) | Oriel HLT |
| 17:00 | Targeting Aging with Metformin (TAME): A Concrete Plan to Pave the Way for Targeting Aging | Nir Barzilai (virtual) | Oriel HLT |
| 17:30 | Treating age-related immune decline with mTOR inhibitor RTB101 | Joan Mannick (virtual) | Oriel HLT |
| 18:00 | Spermidine as an anti-ageing therapeutic to support the ageing immune system | Katja Simon | Oriel HLT |
| 19:00 | Dinner | | Oriel Hall |

## Day 4 – Thursday 25th August 2022

| Time | | Tutor | Location |
|---|---|---|---|
| 9:00 | Discussion of Findings | BLAST team | Oriel HLT |
| 9:30 | Publication Ideas and Plans | BLAST team | Oriel HLT |
| 10:00 | Next Steps | BLAST team | Oriel HLT |
| 10:30 | Coffee and Depart | | Oriel HSR |

# General information

**BLAST helpers**
There will be a number of scientific volunteers who will be assisting during the Summer School to help with the smooth running of the meeting. We are immensely grateful to **Ivan Boubriak, Loren Kell, Thibault Teissier and Christopher Whiteman.** We are indebted to **Karen Froud** for providing excellent administrative support.

**Scientific confidentiality**
BLAST Summer School aims to encourage the discussion of new and unpublished work, so please treat all communications within the conference as confidential. Do not photograph slides without the express permission of the presenting author, and please do not post any data from others on any social media or other platform.

**Conference rooms**
Lectures at Oriel College will take place in the Harris Lecture Theatre (HLT). Tea/coffee break in Oriel will be in the Harris Seminar Room (HSR).
On Tuesday afternoon and Wednesday morning we will be visiting the Broadbent Computer Labs based in the Dorothy Hodgkin Crowfoot building, Department of Biochemistry, South Parks Road OX1 3QU. We will escort you across Oxford to this building. Refreshments will be served during breaks in the stunning Lower Ground Atrium. Please note that this is adjacent to people's desks and workspaces so we'd be grateful if you could keep noise levels to a respectful minimum.

**Sponsors**
The BLAST Summer School is only possible because of the generosity of the BBSRC and MRC, through their funding of the UK ageing networks (UKANet) of which BLAST is one of 11 member networks, and the Oxford Ageing Network, OxAgeN, funded through the John Fell Fund of the University of Oxford.

**Meals**
Lunch and dinner will all be served in Oriel College Hall.
Breakfast (for those staying in college accommodation) is from 8.00-8:30am.
For lunch and dinner timings on particular days, please consult the programme.

**Wifi**
Eduroam is available through high-speed wifi around the college. For those without an Eduroam account, we will provide internet access through OWL. Details will be shared at Registration.

**Mobile phones**
Mobile phone signals can be erratic around the college and in the Biochemistry Department. Please ensure you turn your phone to silent for all of the scientific sessions. For emergency contacts only, the Oriel Porters Lodge may be able to relay urgent messages via the conference helpers if necessary – tel 01865 276555.

**Check in and check-out**
Accommodation will be available from 2pm on day of arrival. The college asks that you check out by 10am on day of departure – since the scientific sessions start at 9am, the BLAST team would be grateful if delegates could check out during the breakfast period on their day of departure. All keys and access fobs must be returned to the Porters' lodge.

**Luggage**
Luggage can be stored in a locked room in staircase 1 (first quad, key from Porters' lodge), or brought at your own risk to the Harris Seminar Room. We will not be able to lock that room as it is accessed at all times.

**Fire safety**
Please familiarise yourself with the fire safety notices in your accommodation and know the nearest fire exit and meeting point. **DO NOT** ignore any fire alarms; the policy is to evacuate immediately on hearing an alarm. Please keep fire doors closed.

**Smoking**
The college is strictly no-smoking (including e-cigarettes), and the non-smoking zone extends to 2m outside the college boundaries. Rooms are fitted with extremely sensitive smoke detectors.

**Safety and security**
The college is constrained by the historic nature of its buildings so please do take care on exposed cobbles and uneven surfaces.

Please use your electronic fob for access and ensure that gates and doors close behind you, especially if they open onto public streets. Do not let anyone else into the college. In case of lost/mislaid access fobs, please report the loss immediately to the Porters' Lodge. Please do not try to access private staircases – students and some fellows have their homes in college. The college is a working academic community and we ask all delegates to respect that. The quiet period is between 11pm and 8am.

**Illness**
If you feel unwell during the conference, please notify the Porters' Lodge who will be able to call for medical assistance on your behalf.

**Parking**
Please note that there is NO PARKING on the college site and parking on adjacent roads is extremely expensive and limited to 2 hours per session (with no return within an hour) so is not suitable for the duration of the Summer School. There is a large central carpark at the Westgate shopping centre a few minutes' walk from college, and several Park and Ride sites around the periphery of the city with very regular bus services running until very late at night/early morning.

WE STRONGLY ADVISE THAT YOU DO NOT TRY TO GET AROUND THE CITY BY PERSONAL CAR: MANY STREETS ARE CLOSED TO THROUGH TRAFFIC AND SOME ARE DESGNATED FOR ZERO EMISSION VEHICLES ONLY. HEFTY FINES ARE LEVIED ON UNSUSPECTING VISITORS.

**Cycling/e-scooters**
Oxford has several 'hire to ride' bicycle and electric scooter schemes. These are used at your own risk.

**Taxis**
Oxford does not have an Uber service but there are several local taxi companies with a dedicated taxi phone in the Porters' Lodge. Examples (without specific recommendations) include:

- Royal Cars 01865 777 333
- GoGreen Taxis 01865 922 222
- ABC Radio Cars 01865 242424 or via app
- OO1 Taxis 01865 240 000 or via app

**Coaches to London and Heathrow and Gatwick airports**
Oxford has excellent transport links including direct bus services to:

- Heathrow and Gatwick airports *(https://airline.oxfordbus.co.uk/)* – much faster than going via London
- Central London (London Tube and X90)

For details of the location of London/airport coach stops and the railway station, please see the map of Oxford on the back page of the programme.

National Express coach services run from Gloucester Green bus station to many locations in the rest of the UK.

Trains run from Oxford station to many other parts of the UK.

**Oriel College**
Oriel College was founded in 1326, and is the fifth oldest college in Oxford, with currently around 300 undergraduates and 200 post-graduate students. Oriel, like the other colleges of the University of Oxford, is an independent self-governing academic body, run by the academic Fellows of Governing Body and supported by a strong team of college officers.

The college site is small, based around three quadrangles plus part of the medieval city (the Island site), where the Harris lecture Theatre and Seminar Room are located. The college is able to provide accommodation in college property for all undergraduates for the entire duration of their course, and for all first year post-graduates, either on the main site or at the college's annexe situated at Rectory Road approximately 10 minutes from the main college site, focusing around the modern James Mellon Hall. However, Oriel is far more than a hall of residence for students: within the college we provide tutorial teaching for undergraduates, mentoring and support for graduate students, and extensive facilities including well-equipped teaching rooms, a lecture theatre, a boat house, three gyms, a chapel, music facilities and a very well-stocked library for the use of college members. There are a number of sporting teams, choirs, drama groups and other cultural activities, with students publishing their own newspaper, and the academic life of the college includes joint activities involving undergrads, graduates and fellows in the Oriel Talks.

**Oxford**

The centre of Oxford contains many buildings of historic interest, together with art galleries and the famous Ashmolean Museum and Bodleian Library, all within walking distance of Oriel.

A number of guided walking tours are offered daily – e.g. https://www.oxfordwalkingtours.com

Oxford is a short distance by bus/taxi from Blenheim Palace, and for those with more commercial interests, the Westgate Centre and the Covered Market offer a huge range of shops. The world-famous Bicester Village retail outlet only a short bus ride away – or now also accessible via a short train ride from Oxford station (Chiltern Railways to Marylebone).

# Speaker Biographies

## Professor Nir Barzilai

**Academic titles:**
Professor of Medicine and Genetics
Ingeborg and Ira Leon Rennert Chair in Aging Research
Director, Institute for Aging Research
at the Albert Einstein College of Medicine,
PI: Nathan Shock Center of Excellence in the Biology of Aging
PI: Glenn Center for the Biology of Human Aging.
@NirBarzilaiMD

Dr. Barzilai is a chaired Professor of Medicine and Genetics and Director of the biggest Center in the world to study the Biology of Aging and the principal investigator of the Einstein Nathan Shock Center and the Glenn Center. He was the recipient of an NIH Merit Award aiming to extend the healthy life span in rodents by biological interventions. He also studies families of centenarians that have provided genetic/biological insights on the protection against aging. Several drugs are developed based, in part, on these paradigm-changing studies. He now leads EXCEL Study (EXCptional Longevity) to recruit 10,000 centenarians and their families to validate and discover new longevity genes. He is leading the TAME (Targeting/Taming Aging with Metformin) multi centre study to prove the concept that multi morbidities of aging can be delayed in humans and change the FDA indications to allow for next generation interventions.

He is the author of over 290 peer-reviewed papers and a recipient of numerous prestigious awards, including the recipient of the 2010 Irving S. Wright Award of Distinction in Aging Research and is the 2018 recipient of the IPSEN Longevity award. He is on the board of AFAR, its scientific director and a founding member of the Academy for Lifespan and Health Span, The Longevity Biotech Association and Longevity Medicine Society. He co-founded CohBar and Lifebioscinces. He has been featured in major papers, podcasts TV program and documentaries (2 TEDx and TEDMED) and has been consulting or presented the promise for targeting aging at The Singapore Prime Minister Office, Prime Minister office in Israel, several International Banks, The Vatican, Pepsico, Milken Institute, Davos Economical Forum, and featured in The Wall Street Journal, New York Times, The Economist and Wired Magazine. His book Age Later was published in the June of 2020

## Professor Lynne S. Cox

I am a biogerontologist and run the Lab of Ageing and Cell Senescence at the Department of Biochemistry, University of Oxford, as well as being the George Moody Fellow and Tutor in Biochemistry at Oriel College, Oxford. I have an MA (Hons) in Natural Sciences and a PhD from the University of Cambridge, and conducted post-doctoral work with Prof Sir David Lane on the tumour suppressor p53, before being awarded a Royal Society of Edinburgh fellowship to set up as an independent scientist. My lab in Oxford researches the biological processes underlying ageing, with a particular focus on human premature ageing syndromes and cell senescence, a process whereby normal body cells change to a harmful state that contributes to diseases associated with ageing. We are using that core information to identify and test possible new treatments with the aim of improving health in later life. Our work is funded through UKRI (BBSRC, MRC), Research England (UK SPINE), Public Health England, Diabetes UK/BIRAX and philanthropic support from the Mellon Longevity Science Programme at Oriel College, Oxford. I am a Fellow of the Royal Society of Biology and recipient of the US Glenn Foundation Award for research into the biological mechanisms of ageing, presented at the House of Lords.

I co-founded the Oxford Ageing Network, OxAgeN, serve on the Clinical and Translational Theme panel of the Biochemical Society, the MRC Ageing Research Steering Group, and the Strategic Advisory Board of the All-Party Parliamentary Group for Longevity, in which role I co-authored the APPG's National strategy report on "Health of the Nation – a strategy of healthier longer lives" launched by the Secretary of State of Health and Social Care in 2020. Internationally, I am a primary international member of Norwegian Centre for Healthy Ageing Network NO-Age, co-chair of the Special Interest Group in Ageing Biology of the European Geriatric Medicine Society and serve on the quinquennial review panel of the NIA Division of Aging Biology (US). I have recently been appointed as co-lead of the new UKRI-funded Building Links in Ageing Research and Translation (BLAST) network and national coordinator of the UK-wide Ageing research Network (https://www.ukanet.org.uk/).

## Professor Evandro F. Fang

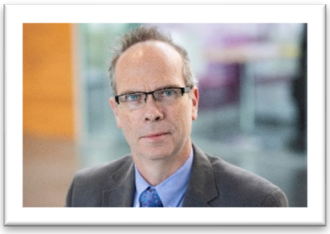
Evandro F. Fang is a molecular gerontologist, leading an international anti-aging laboratory at the University of Oslo; his team is composed of 15+ trainees from 7+ countries. He did his PhD with Chair Professor Tzi Bun Ng at the Chinese University of Hong Kong on anti-cancer drug development (Jan. 2009-Dec. 2011), and his postdoc with Profs. Vilhelm Bohr and Mark Mattson at the National Institute on Ageing, Baltimore USA on the molecular mechanisms of ageing and Alzheimer's disease (Feb 2012-Sep2017).

On the 2nd Oct. 2017, Dr. Evandro F. Fang established his independent laboratory at the

University of Oslo, Norway. His laboratory is focused on the molecular mechanisms of human ageing and age-predisposed neurodegeneration. More specifically, the Fang lab are working on the molecular mechanisms of how cells clear their damaged and aged mitochondria, a process called “mitophagy”, as well as the roles of mitophagy in Alzheimer’s disease. He is fascinated with and actively engaged in moving his laboratory findings to translational applications, with the overarching goal to establish novel and safe biological approaches to promote longer and healthier human lives. Based on the discoveries of the efficacy of boosting NAD+ and turning up mitophagy on promoting healthy longevity and memory by himself and co-workers, he has been involved in 5+ clinical trials (including leading 1).

He has published over 75 papers in peer-reviewed journals with an H index of 32 (by Sep 2020). He has received several awards including The NIH Fellows Award for Research Excellence 2014, 2015 (USA), and an awardee of the prestigious Butler-Williams Scholar on Aging 2016 (USA), an FRIMEDBIO Young Research Talent 2017(Norway), and a finalist of the 2017 ERC Starting grant. He was a recipient of the prestigious DKNVS (The Royal Norwegian Academy of Science and Letters) ‘Young Research Award’ 2020 (Norway).

## Professor Richard Faragher



Richard Faragher is Professor of Biological Gerontology at the University of Brighton and is past Chair of the British Society for Research on Ageing, the International Association of Biomedical Gerontology and the American Aging Association. He read Biochemistry at Imperial College, London and undertook doctoral studies on human premature ageing at the University of Sussex. His primary research interest is the relationship between cellular senescence and organismal ageing. He has published widely on the phenotype of senescent cells and on compounds that reverse the process.

He holds the Royal Pharmaceutical Society Conference Science Medal for his work on the mechanisms of Werner’s syndrome, the Help the Aged ‘Living Legend’ award for his championship of older people, the Paul F Glenn Award for research into the mechanisms of ageing and the British Society for Research on Ageing’s highest honour, the Lord Cohen of Birkenhead Medal. He is a Fellow of the American Aging Association and serves on the Editorial Boards of *Mechanisms of Aging and Development*, *Rejuvenation Research* and *Biogerontology*. He is the Editor in Chief of *Advances in Biogerontology*.

Professor Faragher has served as a member of the Research Advisory Council of the Charity Research into Ageing and on strategy and funding panels for the BBSRC, the US National Institutes on Ageing and the European Union. From 2005-2008 he was Co-director of the BBSRC-EPSRC SPARC programme, a research network designed to build national capacity to conduct inter-disciplinary ageing research. He is currently a Director of the American Federation for Aging Research, serves on the Scientific Advisory Board of the Longevity Vision Fund and co-directs the Building Links in Ageing Science and Translation (BLAST) research network.

## Professor Lorna Harries

Professor Lorna Harries is Professor of Molecular Genetics at the University of Exeter Medical School and co-founder, director and Chief Scientific Officer at SENISCA Ltd., a spin out company founded on the back of 12+ years of academic research from the Harries lab. Lorna gained her PhD from University College London in 1994. Lorna also heads the Exeter Animal Free Research Centre of Excellence (ARC 2.0) funded by Animal Free Research UK. The Harries lab have interests in -omics approaches to the study of ageing and age-related disease processes in humans, and her work takes a genes to systems approach, ranging from 'big data' analyses to detailed individual molecular analysis of particular genes. Her team were the first to report dysregulation of alternative splicing as a new, and druggable, hallmark of ageing; a finding which is now being developed as the basis for a new generation of interventions to treat the underpinning causes, not just the symptoms, of age-related chronic disease

## Professor Janet Lord

**Professor of Immune Cell Biology and Director of the Institute for Inflammation and Ageing at the University of Birmingham.** She is also Director of the MRC-Versus Arthritis Centre for Musculoskeletal Ageing Research and theme lead for sarcopaenia in the NIHR Birmingham Biomedical Research Centre and leads the acute response to injury themes in the NIHR Surgical Reconstruction and Microbiology Research Centre and the Scar Free Foundation Centre for Burns Research.

Her primary research focus is on the effect of ageing upon immune function and how this limits the ability of older adults to resolve inflammation occurring in response to infectious challenge or injury. This has led her to research neutrophil function in healthy elders and also after hip fracture and during infections such as pneumonia. She also researches the link between chronic systemic inflammation and physical frailty in old age and has published papers showing that much of the increased systemic inflammation and sarcopaenia associated with ageing can be prevented by high levels of physical activity in adulthood. Professor Lord has a particular interest in the role played by stress (physical and psychological) and the altered HPA axis in modulating immunity and frailty in old age and following an injury such as hip fracture. She has published several papers showing that a heightened HPA axis (increased cortisol:DHEAS ratio) is associated with poor outcomes after hip fracture.

In 2013 she was awarded the Lord Cohen of Birkenhead medal for her outstanding research in human ageing by the British Society for Research in to Ageing. She was elected a Fellow of the Academy of Medical Sciences in 2015. She has published over 200 original papers and reviews.

## Dr Joan Mannick

Joan Mannick is the Chief Executive Officer and Co-Founder of Tornado Therapeutics which is developing next generation mTOR inhibitors to treat aging-related diseases. Prior to joining Tornado, Joan Mannick was Head of Research and Development at Life Biosciences and Chief Medical Officer of resTORbio which was a spinout of a clinical program targeting aging biology that she led as an Executive Director at the New Indications Discovery Unit of the Novartis Institutes of Biomedical Research. Prior to Novartis, Dr. Mannick was a Medical Director at Genzyme working in multiple therapeutic areas and was faculty member at Harvard Medical School and University of Massachusetts Medical School. Dr. Mannick received her A.B. from Harvard College and her M.D. from Harvard Medical School. She completed her residency in Internal Medicine and an Infectious Disease fellowship at Harvard Medical School.

## Dr Colin McClure

Dr Colin McClure is a new Lecturer in the School of Biological Sciences, Queen's University Belfast. An early career researcher whose interests focus on the genetics which underpin life history dimorphism and ageing between the sexes, Dr McClure is currently addressing these broad questions through the application of novel gene manipulation techniques alongside transcriptomic profiling in the fruit fly, *Drosophila melanogaster*. He contributes a reviewer for age-related journals, and has delivered / coordinated a number of outreach events and exhibitions (e.g. the Great Exhibition Road Festival) to educate the public and children on the biology of ageing. Dr McClure also has a keen interest in the promotion of cross disciplinary training for early career staff and students.

## Dr Karen Melham

Dr Karen Melham is Sponsorship and Ethics Lead in Research Services, University of Oxford. Her academic background is in ethics. She has done research in the social, legal, and ethical implications of emerging technologies, and chaired an NHS Research Ethics Committee.

## Dr Isar Nassiri

I have education and work experience in Genetics (MSc), Bioinformatics (PhD), Computer science (postdoc researcher at The Microsoft Research - the University of Trento Centre for Computational and Systems Biology in Italy), Biostatics (postdoc associate, two years, Department of Biostatistics and Computational Biology, University of Rochester, USA), and Bioinformatics/Statistics (postdoc associate, four years, Department of Oncology, University of Oxford, UK*). I* am working as a Senior Bioinformatician at Oxford Genomics Centre. My core responsibilities are to provide appropriate and timely data processing and analysis for the data being generated by OGC including single cell sequencing datasets.

## Dr Eleanor Platt

**Molecular Scientist within the Biomarkers team at Medicines Discovery Catapult.**
Eleanor undertook a degree in Molecular and Cellular Biology at the University of Bath and completed her M.Phil. in Molecular Cancer Studies at the University of Manchester, with a focus on the role of glucocorticoid receptor in small cell lung cancer cell apoptosis.
She was offered the opportunity to work within the pharmacokinetics laboratory in a large CRO, processing and testing patient biological samples. She subsequently worked within the R&D Department at a leading molecular diagnostics company for five years, developing PCR-based diagnostics to better direct treatment of patients with cancer and infectious diseases.
Eleanor's current research interests focus on ageing and age-related diseases, particularly expression of age-related biomarkers in plasma and the mechanisms through which bisphosphonates such as Zoledronate may reduce the rate of ageing, as well as the incidence of cancers and cardiovascular disease.

## Dr Simona Reed

Simona is a Vice President of Clinical Operations at AltruBio, clinical stage start-up biotech company based in San Francisco, CA. Prior to joining AltruBio Simona was a senior consultant at Genentech's Pharma Technical Regulatory department, with the responsibilities in the global regulatory affairs of the marketed products lifecycle and portfolio management. Before her consulting role, Simona led the Corporate Project Management and Clinical Operations at Tanvex BioPharma where she directed several successful preclinical and clinical programs of the biosimilar products. Before joining Tanvex, Simona was a regional commercial product launch manager at Teva/Allergan with the responsibilities for the global product launch portfolio of over 100 generic products. Simona has commenced her career in the industry as a consultant at Washington Group

International (London UK/Princeton NJ) where she managed number of compliance and operations' projects for several global pharmaceutical companies e.g. Grifols, CSL Behring, Bayer, Gedeon Richter, Pfizer and Boehringer Ingelheim.

Simona received her PhD in Enzyme Histochemistry from the Institute of Experimental Medicine, Czech Academy of Science in Prague, Czechia.

## Professor Katja Simon

Katja Simon trained as an Immunologist at the Deutsche Rheuma-forschungszentrum, Berlin and during her PhD showed that TH1 cytokines are found in excess in human rheumatoid arthritis joints. She was awarded the European League Against Rheumatism **EULAR award**. After postdocs at the Centre d'Immunologie Marseille Luminy and at the Weatherall Institute in Oxford, where she focused on cell death pathways in the immune system, she became a principal investigator. With her team, she pioneered the field of autophagy in the immune system. Her group discovered that autophagy, the main cellular bulk degradation pathway, promotes differentiation of healthy red blood cells and neutrophils, and maintains long-lived cells such as stem and memory T cells. She also showed that it prevents ageing of immune cells and can be used to reverse immune senescence. She has been a Wellcome investigator since 2015. In 2016 she moved to the Kennedy Institute of Rheumatology and became a full professor. In 2022 she started a new group at the MDC in Berlin, Germany with funding from the Helmholtz Society for distinguished professors. She received the 2018 **Ita Askonas prize** for outstanding achievements as a female European group leader.

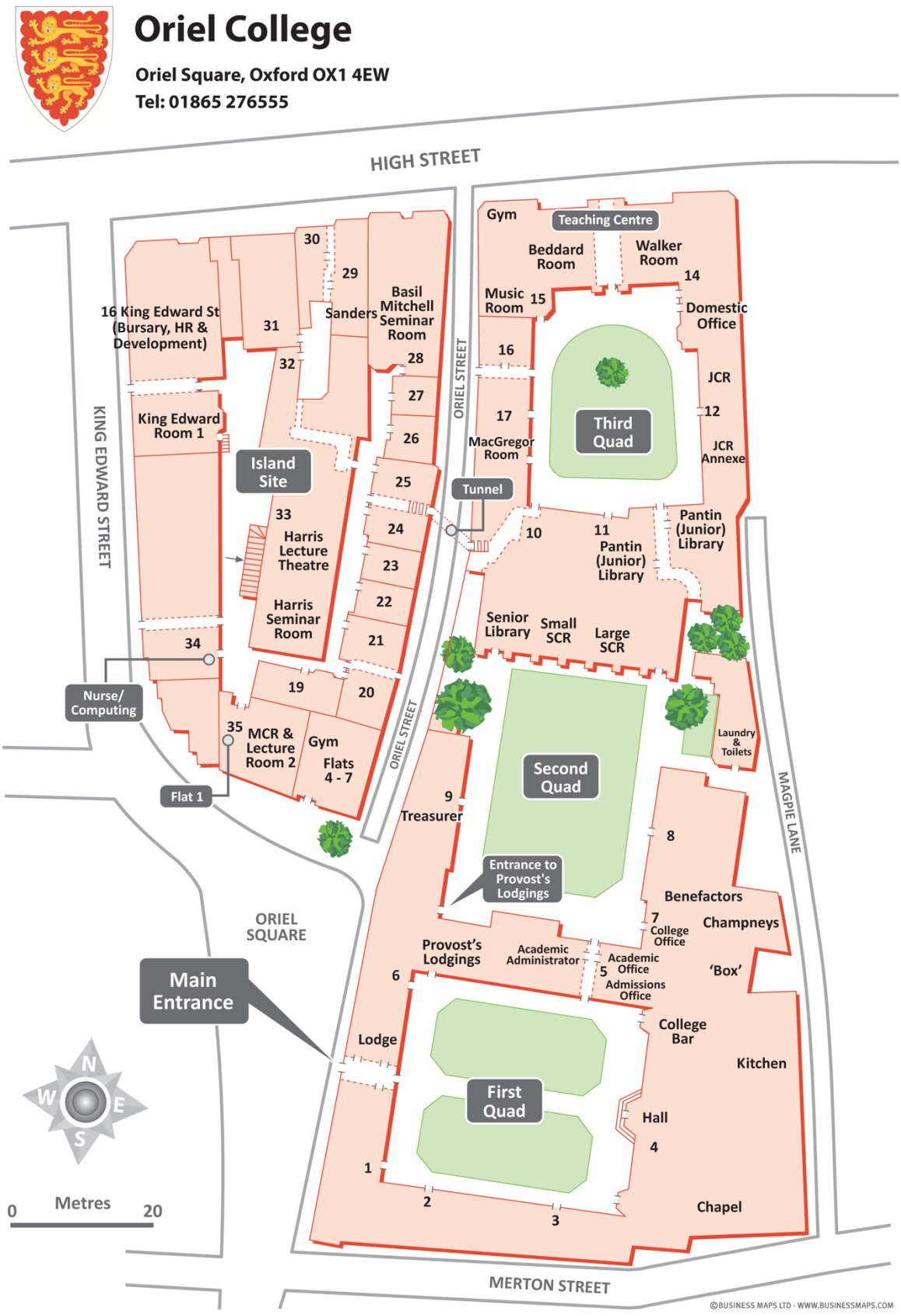
<u>Autophagy in Immune Senescence</u>

With increasing life expectancy, the number of people over 60 years is expected to double by 2050, reaching 2.1 billion worldwide. The severity of many infections increases substantially with age, and the success of childhood vaccination is widely recognized but the importance of vaccination of the elderly population is frequently underestimated. Immune senescence is characterized by a decline in innate and adaptive immunity together with an increase in low-grade chronic inflammation contributing to age-related diseases such as cardiovascular and neurodegenerative diseases. Using tissue-specific knock-out models and human blood samples the Simon team showed that autophagy declines with age in immune cells and prevents immune aging. Recently they discovered a novel pathway that relies on the translational control of autophagy and operates in both mouse and human lymphocytes. This pathway controls proteostasis in long-lived T and B lymphocytes and includes novel therapeutic drug targets.

Reversing or halting immune ageing would open opportunities to improve management of age-related morbidities and have a major impact on the health of our society.

## Dr Kirsty Winn

Kirsty is a cell biologist and pharmacologist experienced in early drug discovery and lead generation. She joined Medicines Discovery Catapult in 2020 as an External Drug Discovery Project Lead with responsibility for providing drug discovery advice, scientific due diligence and robust research plans alongside UK medicines discovery innovators. Prior to MDC, Kirsty led integrated drug discovery programmes for a large CRO, and before that worked for 15 years in large Pharma. As a leader in AstraZeneca's Global HTS group, Kirsty was responsible for delivering hit generation strategies, assay and technology development and leading external alliances and innovation partnerships.




Map of Oriel College

## Map of central Oxford