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Welcome

Over the past year we have continued to build on Newcastle University’s international reputation in ageing research with more outstanding projects, publications and new funding awards.

The following awards and partnerships are the culmination of our efforts to maintain Newcastle’s reputation for major strength in the breadth and depth of ageing research.

Throughout 2017/18, we have:

- Secured funding from The Alzheimer’s Society to host one of three Centres of Excellence in dementia care research
- Won a National Institute for Health Research (NIHR) Global Health bid that sees the beginning of some fantastic global collaborations which will aim to improve the lives of people living with dementia in low – middle income countries
- Moved into the second year of biomedical research in ageing and long-term conditions with the 2017 – 2022 NIHR Newcastle Biomedical Research Centre
- Fed into the ongoing development of the National Innovation Centre for Ageing, which has been making significant progress in building partnerships which link academia with industry and citizens
- Continued to contribute to the exciting and valuable Newcastle City Futures project, within which ageing has been identified as a key player in improving the lives of people in Newcastle

Read more about these projects on pages 2 and 3.

Ageing research in Newcastle has always been a great strength, but with the above partnerships, as well as expanding future collaborations we can proudly say that we’re tackling the full spectrum of ageing research, from biomedical, through clinical and social care, to policy research, as well as innovation and societal impact.

However none of this would have been possible without the ongoing input from the public, facilitated through VOICE – a network of members who contribute experience, insights and ideas to shape research. Our annual report for 2017/18 is a testament to our longstanding vision of collaborative working between researchers, patients and the public, the public sector and industry. Our focus is, and always has been quality of life as we age, specifically helping people live better for longer.

Notwithstanding, some of the research undertaken in Newcastle has shown that while we live longer, we will inevitably experience a number of health issues simultaneously as we age, potentially increasing health care needs and demands on services.

Developing services to meet the needs of our current and future older people must involve service users. In Newcastle we are dedicated to involving wider stakeholders such as the public and patients in all of our work. For example, the James Lind Alliance Survey was launched in July 2017 – the results of which we are due to receive in 2018, and this will help researchers across the country establish academic priorities based on key evidence from people living with, or caring for those with complex health needs in later life. The key success of this survey was the inclusion of the public, patients, carers and health professionals.

But with VOICE becoming an integral part of the National Innovation Centre for Ageing this year, it’s not just about what research is carried out to support work in ageing, but what this research will do to create products, services and innovations that improve lives now.

We’ll cover the above and much more in this 2017/18 Annual Review. Unfortunately, the review only highlights a small proportion of what we’ve done this year, we hope it tempts you to look deeper, and visit us at our webpage www.ncl.ac.uk/ageing for the full flavour of our work!

Professor Louise Robinson
Director, Newcastle University Institute for Ageing

Meeting Global Goals!
Wherever you see an icon like this →️, we’re telling you which one of the 17 UN Global Goals for Sustainable Development we are meeting. Find out more about Newcastle University’s commitment in this area by visiting www.ncl.ac.uk/globalchallenges
Investing in Ageing

Throughout 2017–2018, we’ve been very successful in winning investment from a range of funders and external bodies in order to carry out ageing research across the board; from medical, to social and to environmental. Here we’ve provided an overview of projects, present and future, that show how we collaborate with external colleagues to carry out ageing research in several key areas.

Supporting Care in Ageing

Working with the NIHR for global research into dementia care

Along with a team of experts in this area, Professor Louise Robinson was awarded £2 million from the Department of Health and Social Care, to focus on dementia care and prevention.

The funding was awarded to establish the National Institute for Health Research Global Health Research Group on Dementia Care Prevention and Enhanced Care (DePEC), which will examine dementia care and prevention for a global population. This group was one of 33 to receive more than £120 million of funding for Global Health Research Project.

Dementia, a health priority around the world, has a disproportionately large impact on low and middle-income families. In the absence of a cure, and without a future strategy to reduce the risk and improve care after a diagnosis, dementia will have a devastating societal and economic effect.

The Newcastle University team will bring together expertise in public health and primary care, with global epidemiological research, to examine how to minimise this impact.

Fighting against the postcode lottery of dementia care

In June 2017, The Alzheimer’s Society announced that they were awarding £1.7 million to Newcastle University to create one of three ‘Centres of Excellence’ supported by the organisation, to focus on key priority areas within dementia care research.

Professor of Primary Care and Ageing, Louise Robinson will lead an expert team to understand how to help people receive better support after a diagnosis through ‘primary care’ routes such as GPs or community services. The team believe this approach could reduce the so-called ‘postcode lottery’ where access to support through secondary care services such as memory clinics, can vary depending on where a person lives.

Priority Setting Partnership in Multiple Conditions in Later Life

In July 2017, the James Lind Alliance Priority Setting Partnership (PSP in Multiple Conditions in Later Life) was launched, supported by the National Institute for Health Research. Newcastle was selected to lead on this PSP, given the high calibre of ageing research and clinical care in the city and wider region. Dr Lynne Corner, Director of Engagement at Newcastle University set up a steering group to ensure the survey reached as many people as possible. The aim is to improve quality of life, care and treatment for older people living with multiple conditions.
The National Innovation Centre for Data (NICD)

The National Innovation Centre for Data is a £30m initiative; bringing together industry, the public sector and world-leading academics to develop the skills, ideas and resources needed to exploit the opportunities offered by the explosion in digital data.

From its home on the Newcastle Helix site, alongside the National Innovation Centre for Ageing, the National Innovation Centre for Data will work with industry and researchers; enabling businesses to extract value from smart data and increase competitiveness; realising the potential of big data to address specific challenges in areas including health, automotive and manufacturing.

This has a wealth of potential for health, ageing and wellbeing, and will be at the forefront of new innovations in this area.

The National Institute for Health Research Innovation Observatory (NIHRIO)

NIHR Innovation Observatory is an independent research centre located at Newcastle University, funded by NIHR and hosted by the National Innovation Centre for Ageing. NIHRIO is a national horizon scanning centre which means they are keeping an eye on the future, looking for upcoming changes in healthcare. Understanding future medicines, devices and diagnostics helps shape policy, regulation, approvals and stimulates research activity. They look for technologies that are 5–10 years from being publicly available, and these are continually tracked as they evolve from patent to patient.

Creating homes and cities for the future

Led by Rose Gilroy, Professor of Ageing, Policy and Planning at Newcastle University, the Future Homes project is dedicated to developing future housing for an ageing society.

Having won financial support from the Homes and Community Agency, this project combines partners from local authority and industry to create homes that combine in one place, innovations in flexible living, materials, digital technology and zero/low energy systems, to provide supportive homes for everyone at any life stage.

The NIHR Newcastle Biomedical Research Centre (BRC)

A partnership between the Newcastle upon Tyne Hospitals NHS Foundation Trust and Newcastle University hosts the NIHR Newcastle BRC. One of 20 BRCs, funded by the National Institute for Health Research in England, the Newcastle BRC focuses on world-class research in ageing and long-term conditions. As such, Newcastle is at the forefront of biomedical research into ageing.

Having won the bid to host this Government and Newcastle University-backed centre of ageing innovation in 2014, progress has been swift since then, particularly in the past year.

The Centre is bringing together academics, the NHS, as well as public and private sectors, to collaborate on challenges and opportunities presented to us as we age, and helping us position the region as the key location for innovation in ageing. To learn a bit more about the National Innovation Centre for Ageing over the past year, (see pages 4 and 5).
Newcastle was awarded the National Innovation Centre for Ageing based on its experience of practical innovation, academic expertise in ageing, and for the reputation for public involvement in ageing research, here’s how it works:

- **Newcastle University Institute for Ageing**: The Institute for Ageing is the front door to ageing research at Newcastle University. It is a network of age-related researchers who work across a range of academic areas.

- **National Innovation Centre for Ageing**: The National Innovation Centre for Ageing is a national centre, hosted by Newcastle University. They work nationally and globally with businesses, academics, third sector and other groups and individuals from across the UK, drawing on world-class expertise in order to translate evidence based research into innovation for longer, healthier lives.

- **VOICE Citizen involvement**: VOICE is a global organisation that supports members of the public to become actively involved in contributing experience, insights and ideas to shape research that transforms health and ageing across the life course.

- **Innovating for social and economic good**: Newcastle University Institute for Ageing offers academic ageing content from universities throughout UK, Europe and beyond.
NICA Team Up with Uber to Launch Option For Wheelchair Users

In August 2017, our colleagues at National Innovation Centre for Ageing, Newcastle University teamed up with Uber to launch a new service that gives passengers the ability to request an accessible licensed private hire vehicle through their app.

All uberACCESS partners are top-rated drivers who have received Disability Equality Training from Transport for All. As with all partners on the Uber app, drivers are licensed for private hire by a local authority and have passed an enhanced DBS check – the same as black cab drivers, teachers and care workers.

As Director for the National Innovation Centre for Ageing at Newcastle University at the time, Professor Roy Sandbach OBE, said: “With an ageing population, business must respond and deliver innovation in all aspects of daily life.

“Developing accessible vehicles and ensuring specially-trained drivers for those passengers who need an extra helping hand will help provide safer, more comfortable transport for everyone, including those older passengers who use wheelchairs”.

Go-ahead Given for £50m National Innovation Centre Building

In November 2017, permission was granted for a major new development which will house relevant research and innovation expertise with the view to linking this with industry and the public sector.

The site, which has been in construction for some time, will not only house the National Innovation Centre for Ageing (NICA), but also the National Innovation Centre for Data (NICD) and the National Institute for Health Research Innovation Observatory (NIHRIO).

Professor Michael Catt, Director of NICA said: “By 2050, the number of people in the world aged 60 years or over is projected to more than double, reaching nearly 2.1 billion. This globally ageing population presents many challenges around quality of life, and health and wellbeing as well as multiple economic and social opportunities.

“This new building will provide NICA and NICD with a much-needed facility to bring together industry, experts and the public under one roof to drive the collaborative development of new products and services and cement the North East as a global trailblazer in innovation.”

This unique facility will accelerate the development of goods and services designed to help us all live better for longer, and will also house facilities for product demonstration, market testing, conferencing and public engagement. It is designed to be age-inclusive and will also offer exciting opportunities for collaboration and new product development in many areas including digital ageing and design; drawing on the complementary expertise that the National Innovation Centre for Data and the NIHR Innovation Observatory offer. The building also provides opportunities for co-location alongside the National Innovation Centre for Ageing’s experts, for businesses who are operating in, or wish to enter, the ageing market.

Industry Leader Appointed to Lead Innovation for an Ageing Population

In October 2017, Professor Michael Catt was appointed as Director of the National Innovation Centre for Ageing. Working alongside the Newcastle University Institute for Ageing, as well as other exceptional areas of ageing innovation across the country, the National Innovation Centre for Ageing is a Government and Newcastle University backed centre which works with innovation experts, applied researchers, industry and the public to explore, test and bring to market products which promote healthy ageing and wellbeing as we grow older.

Professor Michael Catt joined the existing team, bringing expertise from industry; notably his former position leading the ‘Healthy Ageing’ programme at Unilever’s Corporate Research Laboratory. He has also provided strategic research and development contributions to multinationals, SMEs and start-up businesses engaged in improving health and wellbeing, and is well placed to lead the National Innovation Centre for Ageing in playing a pivotal role in enabling the development of innovations which enhance healthy ageing.
Making an Impact on Society

We research ageing across all disciplines within Newcastle University. This section demonstrates the impact our work has on society and individuals.

How Do We Age?

Global Oral Health in the Older Population

Dr Nicholas Jakubovic is a Senior Lecturer in the School of Dental Sciences at Newcastle University, researching and teaching on a range of areas, including dental caries and periodontitis (gum disease), which are among the most common diseases that affect older people across the globe.

Recently, he has been working to understand the mechanisms that lead to a build-up of dental plaque on teeth, which is the key trigger for periodontitis. One major area of research is targeted towards understanding the extracellular matrix that holds dental plaque together. Projects have investigated the role of extracellular DNA as part of this matrix.

Periodontitis is a major issue for ageing populations, since there is a clear correlation with age. Loss of teeth due to periodontitis can lead to difficulty eating and result in nutritional deficiency. Also, there are links between periodontitis and systemic conditions such as diabetes and (with a weaker evidence base) rheumatoid arthritis.

The Effect of Medication on Habitual Gait

In a study supported by the Newcastle University Institute for Ageing, Dr Silvia Del Din was looking into the effect of medication on habitual gait in people with Parkinson’s. This feasibility study investigated how participants experience gait impairments and how medication may have an effect.

Understanding this could lead to enhanced, at-home patient care and more targeted medication strategies for improving gait and to reduce its associated burden, e.g. falls.

In June 2017, Dr Del Din and her colleagues presented this research poster at the (2017) ISPGR World Congress in Fort Lauderdale, Florida.

New Brainstem Changes Identified

In January 2018, a pioneering study, published in Annals of Neurology, found that patients with Parkinson’s disease have more errors in the mitochondrial DNA within the brainstem, leading to increased cell death in that area.

The study’s deeper understanding into Parkinson’s disease suggests a new target for therapies for patients with the debilitating condition.

Dr Joanna Elson, a mitochondrial geneticist at Newcastle University, said: “Our study is a major step forwards in gaining an enhanced insight into the serious condition.

Only by understanding the complexities of what happens in specific cell-types found in specific areas of the brain during this disease can targeted treatments for Parkinson’s disease, be produced.”
Increasing Vitamin D in Eggs

Dr Tom Hill is a Senior Lecturer in Nutrition, with a research interest in micronutrients in health and disease, as well as nutritional status and health in later life. Over the past few years he has been working with the food industry on an exciting project funded by Innovate UK that aimed to explore the possibility of enriching eggs with vitamin D. Vitamin D deficiency is a common public health problem within the UK, especially in older people. The right amount of vitamin D is found in very few foods, so there is an urgent need to develop higher vitamin D containing foods to increase nutritional intake of the population. Dr Hill and his partners; Noble Foods and DSM, as well as animal science colleagues in Newcastle University’s School of Natural and Environmental Science, have shown that by manipulating the vitamin D content in the diet of laying hens, whilst remaining within EU feed guidelines, it is possible to increase the vitamin D content of eggs by over 40%. To understand more about the commercial potential to produce vitamin D enriched eggs, the consortium have obtained more Innovate UK funding to explore sensory attributes and consumer acceptance of these products. The next phase of the project also involves undertaking a human intervention trial in older adults to explore whether consuming these enriched eggs has any effect on vitamin D status and musculoskeletal health in 65+ year olds.

Stimulating the Brain Thought to Improve Cognition in Later Life

In April 2017, researchers from Newcastle University published a study in PLOS Medicine that explored how stimulation of the brain, such as in leadership roles or education, can help people stay mentally healthy in later life.

The data came from the Cognitive Function and Ageing Study Wales (CFAS-Wales) cohort, which involved interviews from 2,315 mentally fit volunteers aged 65 and over.

Experts from the universities of Newcastle, Exeter and Bangor analysed whether a healthy lifestyle was associated with better performance on a mental ability test. They found that a healthy diet, more physical activity, more social and mentally stimulating activity and moderate alcohol consumption all seemed to boost cognitive performance.

Biomarkers of Prostate Cancer

Over 2017 and 2018, MRes project student Alex Lloyd worked with Drs Emma Clark and Rakesh Heer from the Northern Institute for Cancer Research, and Drs Gavin Hudson and Angela Pyle from the Institute of Genetic Medicine, on a project which examines cell free mitochondrial DNA as a biomarker of prostate cancer.

This proof-of-principle study aims to show that mitochondrial DNA can be reliably detected in the plasma of newly diagnosed, advanced prostate cancer patients. Having detected this, clinicians would have a better basis of knowledge for which treatment option will be best for the patient.
New Guidelines on Diagnosing Dementia with Lewy Bodies

Ian McKeith, Professor of Old Age Psychiatry at Newcastle University leads the international dementia with Lewy bodies (DLB) consortium which carries out research into diagnosis and management of the illness.

This research was the culmination of work carried out by the consortium, in which they highlighted important clinical and diagnostic biomarkers for DLB, but also call for more trials in to the illness. Recently, they have produced new recommendations, created by experts, patients and care organisations, in order to guide people to a faster diagnosis of DLB, if they recognised the symptoms.

DLB is a disorder which shares symptoms with Alzheimer’s and Parkinson’s, but also has very distinct symptoms, that when identified, can assist with a more accurate diagnosis. The guidelines focus on these symptoms and ensure clinicians have the full facts so that they’re able to distinguish between forms of dementia and help patients get the treatment they need faster.
Predicting the Rate of Ageing and High Dependency

In August 2017, research published in The Lancet, led by experts in Newcastle, analysed the extent to which the care needs of older people had changed over the last twenty years. Lead author on the paper, Professor Carol Jagger, commented that “if dependency prevalence remains constant, we estimate that by 2025, there will be an additional 353,000 older people with substantial care needs”, which raises concerns over implications for health and social care services. This research was carried out using data from the Cognitive Function in Ageing Studies (CFAS) that involves collaboration between researchers at Newcastle University, Cambridge University, and Nottingham University.

What Factors Make ‘Age-Friendly Environments’ Effective?

In January 2018, a study identified the most effective initiatives for promoting respect and social inclusion for older people living in the community.

The study by Newcastle and Liverpool universities, published in the journal Systematic Reviews, aimed to establish what is known about the impacts of initiatives designed to promote respect and social inclusion in later life.

Dr Nicole Valtorta, Research Associate at Newcastle University and co-author of the study, said: “Initiatives that promote social inclusion and respect for older people have the potential to significantly improve people’s health and wellbeing. “This review highlights some of the benefits we know about, but also invites the research, policy and practice communities to think about ways of strengthening the evidence base in areas where there is still quite a bit of uncertainty”.

Diseases will Double by 2035

In January 2018, Newcastle University research revealed that the number of older people diagnosed with four or more diseases will double between 2015 and 2035.

The research, published in Age and Ageing, came from the Population Ageing and Care Simulation (PACSim) model which was developed by Professor Carol Jagger and Dr Andrew Kingston from the Newcastle University Institute for Ageing.

The main finding was that much of the increase in four or more diseases, which experts term complex multi-morbidity, is mostly a result of the growth in the population aged 85 years and over, but the model also shows that future young-old adults, aged 65 to 74 years, are now more likely to have two or three diseases than in the past. This is probably due to their higher prevalence of obesity and physical inactivity which are risk factors for multiple diseases.

Professor Jagger said: “These findings have enormous implications for how we should consider the structure and resources for the NHS in the future. Multi-morbidity increases the likelihood of hospital admission and a longer stay, along with a higher rate of readmission. These factors will continue to contribute to crises in the NHS.”

Inequalities in Later Life

A report published in December 2017 by experts at Newcastle University and The International Longevity Centre UK (ILC-UK), highlighted huge disparities in health, financial security, social connections, and housing. The report suggested that those hit hardest by these inequalities are at a major disadvantage, cumulatively, as they grow older.

Older women are more vulnerable to financial difficulties than older men, with their employment history and family circumstances impacting on pension income and ability to save. The report also raises concerns for a number of other areas of inequalities, such as physical and mental health, financial security, social connections and home and living environment.

Experts have therefore called for action to tackle these inequalities. They stated that Government policies and employers’ practises need to change to enable women to stay in or return to the labour market. This should mean increasing the quality, affordability and availability of childcare, and helping carers stay in work.
Making an Impact on Society (cont.)

How Can We Meet The Global Challenge of Ageing?

Experts Call for Specialist Medical Teams for Rapidly Ageing Society

In February 2018, Director of the Newcastle University Institute for Ageing, Professor Louise Robinson led a study, published in BMJ Open, which highlighted the burden of healthcare from our rapidly ageing population.

The study, which used data gathered through the Newcastle 85+ study, revealed that people over the age of 85 are more likely to consult their GP for their medical needs. By the age of 90, most primary care consultations are with a GP.

Professor Robinson commented: “Our society is rapidly ageing. The fastest growing sector of our population is the very old and there is increasing concern about the impact this will have on the NHS.”

The study showed that the majority of care for older people falls on GP not hospital services. This is particularly worrying as this group requires a complexity of care which GPs may not be trained in at a time when the NHS is under increasing strain.

It is essential that current and future GPs are appropriately skilled and adequately supported by specialist colleagues, as the main healthcare provider for a rapidly ageing society with complex and challenging needs.

First of its Kind Workshop to Focus on Clinical Trials in Older People

In March 2018, Avan Sayer, Director of the NIHR Newcastle Biomedical Research Centre and Professor of Geriatric Medicine, invited colleagues from across the country and Newcastle University to initiate discussions on how to build capacity for the participation of older people in clinical trials.

The event was the first of its kind, and responded to the need to build not only capacity but also capability for translational ageing research relevant to the needs of older people.

Despite older people being the major users of healthcare, most clinical trials enrol younger people with single diseases. Evidence from clinical trials is therefore not relevant enough to the needs of older people or health services, and this workshop signalled the change in direction for research in this area.

Sharing Information on Dementia

Beginning on 6th November 2017, Newcastle University’s Learning and Teaching Development Service, along with the Dementia Innovation Hub, launched their massive open online course (MOOC) on dementia. ‘Dementia Care: Staying Connected and Living Well’, was a free, four week course, delivered online to a global audience of health workers, public and carers, aiming to give participants the knowledge and tools needed to connect and care for someone living with dementia.
International Links

We’re committed to working across all borders to make positive changes for the health, wellbeing and lives of individuals and societies the world over. This year, we have been involved in research globally, most notably by securing National Institute for Health Research (NIHR) grant income to conduct research within designated communities in low-middle income countries, but also by attending global events.

Collaboration on Global Health

In February 2018, Professor Louise Robinson visited the team of researchers forming part of the NIHR Global Health Research Group on Dementia Prevention and Enhanced Care (DePEC), in Kerala. For this project, there are local teams in each of the four geographic areas concerned; UK, Malaysia, Tanzania and Kerala, and this was the chance for colleagues in Kerala to work with Professor Robinson, the project lead, to progress and establish priorities.

Examining the Biology of Ageing

The 8th Annual Alliance for Healthy Aging was held in Groningen in November 2017, under the theme of ‘Metabolism and Aging’. Several Newcastle University researchers attended the event to deliver key notes, updates, chair sessions and present posters, including Professor Thomas von Zglinicki, Scientific Director of the Newcastle University Institute for Ageing.

UK-Japan Seminar on Dementia

In March 2018, Professor Louise Robinson visited colleagues in Japan, where she took part in a UK-Japan seminar on dementia care research through multidisciplinary approaches, specifically dealing with perspectives on care, community and environment. The seminar was part of a larger visit where key stakeholders came together to develop networks for future Japan-UK collaborations.

Gerontology in San Francisco

In July 2017, just over 10 senior academics and Research Associates from Newcastle travelled to San Francisco to attend the IAGG 2017 World Congress of Gerontology and Geriatrics, as well as host several symposia and academic poster presentations.

The IAGG World Congress is a global event, hosted by the International Association of Gerontology and Geriatrics. Its mission is “to promote the highest levels of achievement in gerontological research and training worldwide, and to interact with other international, inter-governmental and non-governmental organizations in the promotion of gerontological interests globally and on behalf of its member associations”.

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The Alliance for Health Aging conference was founded by the Mayo Clinic Robert and Arlene Kogod Center on Aging in the USA, and University Medical Center Groningen, University of Groningen, Noborer Foundation and Vita Valley, all in the Netherlands.

Since 2015, Newcastle University has been involved in the organisation of the conferences, which are dedicated to translational research on ageing with the objective to bring together scientists, clinicians and engineers, and providing a forum for the exchange of ideas.
Working to Safeguard Older Adults

In February 2018, we worked with the Home Office to deliver a Safeguarding event aimed at first response, primary and secondary care health care workers whose day-to-day activities involve the care of older adults, often those who are vulnerable.

Colleagues from the Home Office travelled to Newcastle to deliver the workshop to an audience of over 80 people; made up of those working in Trusts, Councils, Police and Crime Commissioners, a range of age-related charities and support organisations.

The event was a great success; bringing together people to encourage awareness of local projects, activities and initiatives which are being undertaken in the region, as well as allowing delegates to discuss and recognise some of the top regional issues. The ultimate aim of the event was to identify what can be done collaboratively in achieving outcomes to protect and prevent older people from crime in the local region.

How to Stay Young – Newcastle Ageing Research on the BBC

In September 2017, researchers, including those from Newcastle University, featured in a three-part BBC feature called How to Stay Young. Presented by Angela Rippon and Dr Chris van Tulleken, the show featured health experts who, using the latest scientific research on ageing, were tasked with helping volunteers by giving them a complete lifestyle overhaul, to bring their body age closer to their birth age in just 12 weeks.

Working alongside the Institute for Ageing at Newcastle University, the BBC built an ambitious anti-ageing lab, where they tested some the country’s worst offenders to get the most complete picture of how they were ageing. The results from these tests provided their real body age, and allowed them to put together a personal plan.

Health experts from Newcastle University included Professors Mike Trenell, Paula Moynihan, Lynn Rochester, Mark Birch-Machin and Dr Daniel Collerton, covering diet, movement and brain function issues with the volunteers.

Image Credit: BBC Studios/Sean Elliott
The North East is Top of the League

In August 2017, the National Institute for Health Research Clinical Research Network reported their figures on patient participation in research. The result showed that Newcastle was top of the league for patient involvement for the 6th year running, while 65% of Trusts across the country increased their research activity overall, contributing to the drive for better treatments for all NHS patients.

As a partnership between the Newcastle upon Tyne Hospitals Trust and Newcastle University, the NIHR Newcastle Biomedical Research Centre relies on the participation of patients and public to perform pioneering research activity. The BRC award, worth over £16m aims to improve lives through world-class research in ageing and long-term conditions.

New App Helps Communication

Young people who have difficulty talking to older relatives or friends with dementia were the inspiration for a smartphone app called Ticket-to-Talk, designed by researchers at Newcastle University.

The project was led by Dr Tony Young, Reader in Applied Linguistics and Communication at Newcastle University, in collaboration with the regional charity Youth Focus North East. The new tool is designed to give young people more confidence and pave the way to easier and more enjoyable communication with their loved ones or people they care for.

The project was developed after a series of six workshops as part of the DemYouth project, in which researchers at Newcastle University have been working with young people with personal experiences of dementia. The study identified common concerns and looked at ways in which new digital tools or services might be of support.

Patients and Researchers Reunite

In July 2017, patients who took part in research into bowel health more than a decade ago, reunited for a follow-up study to help experts gain a better understanding into the risks of bowel cancer.

Bowel problems are common, and lifestyle factors, such as diet and physical activity, are known to be key in the development of conditions affecting the large bowel, such as cancer and ulcerative colitis.

Ageing is a significant factor and scientists at Newcastle University wanted to revisit a study to look at what effect this has on cells in the large bowel and whether these are influenced by lifestyle choices.

The Biomarkers Of Risk In Colorectal Cancer (BORICC) follow-up study – called BFU – aimed to enhance understanding of the relationship between ageing, diet, physical activity and health of the bowel.

Red Spot Babies Celebrated at Event

A celebratory event was held in June 2017 for a childhood research project, the Thousand Families Study, set up 70 years ago, designed to provide data for ageing and health research in Newcastle.

The valued participants of the study, named ‘Red Spot’ babies after the red mark that identified them as participants on their medical records from birth, were brought together to celebrate the 70th anniversary of the project at an event that took place in Centre for Life, Newcastle.

Set up by experts at Newcastle University and the Royal Victoria Infirmary, the Thousand Families Study initially aimed to examine the health of infants in the city following the Second World War. It began as a way of improving the health of infants, then the health of children and now enables researchers to identify how health and behaviours across the life-course can influence individuals’ wellbeing in retirement.
This year, the NIHR Newcastle Biomedical Research Centre have welcomed 13 new students to carry out PhD projects linked to biomedical research and ageing. Below we give a brief overview of the candidates and their research focus.

**Nana-Jane Chipampe**

**Project:** Age-related bladder dysfunction and mitochondrial biology

Supervised by Dr Rakesh Heer, Nana-Jane’s project focuses on characterising mitochondrial biology in the ageing bladder. This will involve urine and blood based mitochondrial DNA targeted deep sequencing from patients with bladder cancer. Bladder cancer is the most common urinary tract cancer accounting for over 10,000 new diagnoses each year in the UK. Currently there are no bladder urinary biomarkers in routine clinical use and current translational research is focused on the detection of tumour genomic DNA in either voided cells or urinary cell-free DNA.

**Matthew Hunt**

**Project:** Muscle function as a mediator of ageing phenotype in people living with HIV: a basis for stratified intervention

Supervised by Dr Brendan Payne, Matthew is based within the Wellcome Trust Centre for Mitochondrial Research, where he looks at muscle function as a mediator of the ageing phenotype in people living with HIV. Despite complete suppression of viral load and immune recovery, people with HIV experience accelerated molecular ageing, leading to an increased risk of developing age-related conditions such as osteoporosis, metabolic disorders, cancer and cardiovascular diseases. By performing a range of clinical and molecular techniques on skeletal muscle from HIV positive and negative patients, the project aims to form a basis for a stratified intervention.

**Christopher Dowson**

**Project:** An investigation of the credentials of a novel lysine deacetylase as an age-related biomarker for periodontitis

Christopher will work with Dr John Taylor, Senior Lecturer in Molecular Immunology in the School of Dental Sciences. The project will investigate the potential of a novel lysine deacetylase as an age-related biomarker for periodontitis. Identifying a biomarker for periodontitis could aid diagnosis of the disease and could improve our ability to monitor disease progression and treatment effectiveness.

**Ian Herron**

**Project:** Development of a diagnostic and therapeutic response biomarker for patients with rheumatoid arthritis

Ian’s project is supervised by Dr Amy Anderson and is based in the Inflammation, Immunology and Immunotherapy laboratory. His research is concerned with the identification and validation of robust biomarkers that distinguish rheumatoid arthritis (RA) from other inflammatory joint diseases, to identify effective treatments for individual patients. The identification of biomarkers is important as they have potential to transform the management of RA, improving patient care, quality of life and longevity.

**Roisin Stout**

**Project:** Interrogating mitochondrial dysfunction in human facial appearance and ageing

Working with her Supervisor, Professor Mark Birch-Machin, Roisin is based with the Dermatological Sciences team where she is researching the role of mitochondrial dysfunction in facial appearance and ageing, which can hopefully help establish facial imaging as a non-invasive diagnostic tool for assessing mitochondrial disease, and further investigate its role in premature ageing.
Leena Habiballa
Project: Investigating the impact of cellular senescence on muscle ageing
Leena has joined Dr Joao Passos’ lab in order to investigate the role of cellular senescence in skeletal muscle ageing. With age, our muscular function and strength decline, leading to loss of muscle mass and capacity for physical activity, known as sarcopenia. The goal of the project is to characterise the nature of cellular senescence in ageing muscle, determine the signalling pathways involved, and identify possible interventions to improve health outcomes in ageing populations.

Ramtin Mehraram
Project: Brain dynamics as confirmatory biomarker of dementia with Lewy bodies versus Alzheimer’s disease – An electrophysiological study
Supervised by Dr Luis Peraza-Rodriguez, Ramtin’s research focuses on assessing confirmatory biomarkers for dementia with Lewy bodies (DLB) through analysis of electrophysiological brain measures, such as EEG and MRI data. With this research he aims to contribute in a significant way to the research on biomarkers for dementia, in particular to the effective discrimination of DLB from other dementia pathologies at an early stage diagnosis level.

Charlotte Moore
Project: The ageing bladder and urinary tract infections: the impact of bladder polymicrobial colonisation
Working with Dr Phillip Aldridge, Charlotte is conducting a clinical research project into antibiotic resistance in urinary tract infections, which involves collecting blood, urine and perineal samples to analyse. Drawing on her experience of working as a nurse, she is interested finding evidence for better clinical management of patients and having a positive impact on patient outcomes in the future. She aims to identify biomarkers in patients with urinary tract infections and the diversity of micro-organisms and their interactions with each other and the host, in order to improve patient outcomes and patient care by providing evidence in how to treat patients in an effective manner and how to change healthcare policy to do so.

Jadine Scragg
Project: Lifestyle as Therapy in Liver Disease
Supervised by Dr Kate Hallsworth, Jadine is working on the role of lifestyle in Non-Alcoholic Fatty Liver Disease, Hepatocellular Carcinoma and those awaiting liver transplants. She will be implementing lifestyle interventions in these populations, ranging from low calorie diets to exercise prescription, and investigating the impact of this in fitness levels and overall outcome. Her goal is to establish a concrete evidence base for lifestyle as therapy, and implement exercise prescription into clinical practice.

Lucy Gee
Project: Understanding how bile acids cause cognitive deficits in Primary Biliary Cholangitis (PBC)
Supervised by Professor Fiona Oakley, Lucy’s research focuses on unpicking the mechanisms underpinning the memory deficits found in PBC patients – an area which is largely unstudied. Throughout the project she aims to explain the cellular mechanisms involved in the neurological symptoms of PBC, (particularly the involvement of the blood brain barrier). Importantly, this will lead to a greater understanding of neurological symptomatology in liver disease, the development of new drug treatments, and improved quality of life for patients. As well as highlighting the importance of the liver-brain axis and the wider need for non-compartmentalised multi-organ care not just in liver disease, but medicine as a whole.

Fareeha Tariq
Project: The role of somatic mutation in immune dysregulation of CD8+ T cells in rheumatoid arthritis
With Supervisor Professor Matt Collin, Fareeha will focus on the somatic mutations and immune dysregulation in rheumatoid arthritis (RA). In this project, she performs variant calling in RNA sequenced data from RA patients, as well as establishing a link between ageing and clonal haematopoiesis. This will lead to the identification of biomarkers that predict disease severity and response to the treatment.

Daniel Maunder
Project: The development and ageing of human skin
Supervised by Professor Muzifah Haniffa, Daniel’s PhD spans both the skin and oral disease and musculoskeletal themes within the NIHR Newcastle BRC. In his project he aims to improve our understanding of Giant Cell Arteritis (GCA) pathogenesis by investigating multinucleated giant cells (MGC) formation and interrogate this to gain insight in to the mechanisms underlying GCA. The mechanism underlying the formation of MGCs in GCA and their role in the pathogenesis of the condition are not well understood but may provide a window to help us understand why the disease develops.

Sadaf Iqbal
Project: Advanced photoplethysmography based pulse wave analysis for targeted assessment of endothelial dysfunction in systemic sclerosis and related conditions
Supervised by Dr John Allen, Sadaf’s research focuses on systemic sclerosis and identifying a photoplethysmography (PPG) based endothelial dysfunction (ED) biomarkers using state-of-the-art analysis techniques. The research aims to investigate low cost PPG as a diagnostic tool to allow a better understanding of endothelial dysfunction, and how this can be translated into clinical practice and for future device development.
Newcastle’s Ageing Network

As the gateway for ageing research, we bring together colleagues from across all three academic faculties of Newcastle University to undertake a unique, multidisciplinary approach.

How Do We Age?

Faculty of Medical Sciences

- The NIHR Newcastle Biomedical Research Centre
- Centre for Ageing and Vitality
- Centre for Integrated Research into Musculoskeletal Ageing (CIMA)
- The Ageing Biology Centre
- Wellcome Trust Centre for Mitochondrial Research
- Institute for Genetic Medicine
- Institute of Neuroscience
- Institute for Health and Society
- John Walton Muscular Dystrophy Centre
- Newcastle Centre for Fatigue Research
- Human Nutrition Research Centre
  - Centre for Health and Bioinformatics
  - Centre for Integrated Systems Biology of Ageing and Nutrition
  - NIHR Innovation Observatory
  - National Innovation Centre for Ageing

How Can We Age Better?

Faculty of Humanities and Social Sciences

- Centre for Research in Linguistics and Language Sciences
- Institute for Creative Arts Practice
- Humanities Research Institute
- School of Arts and Cultures Dementia and Imagination
- Research Centre in Film and Digital Media
- Centre for Knowledge, Innovation, Technology and Enterprise
- Centre for Urban and Regional Development Studies
- Global Urban Research Unit
- Policy, Ethics and Life Sciences
- Business School
- Newcastle Centre for Literary Arts
- NIHR School for Primary Care Research
- NIHR School for Public Health Research
  - Centre for Health and Bioinformatics
  - NIHR Innovation Observatory
  - National Innovation Centre for Ageing

How Can We Meet The Global Challenge of Ageing?

Faculty of Science, Agriculture and Engineering

- Open Lab
- Newcastle Centre for Railway Research
- National Centre for Energy Systems Integration
- Centre for Rural Economy
- School of Mechanical and Systems Engineering
- School of Agriculture, Food and Rural Development
- National Innovation Centre for Data
  - National Innovation Centre for Ageing
  - Centre for Health and Bioinformatics
  - Centre for Integrated Systems Biology of Ageing and Nutrition
Our Team

The Newcastle University Institute for Ageing brings together research from across the whole University, but we have a core team across several functions.

Core Team

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Looking Ahead

Coming up in 2018/19

At the time this Annual Review goes to print, The Great Exhibition of the North will be in full swing across Newcastle and Gateshead. From June until September, the exhibition will highlight northern innovation, design and art projects across venues in the North East. One of three starting points to the exhibition is the city’s Great North Museum, which will house the ‘Which Way North’ exhibit from 22nd June until 9th September 2018. Within this exhibition, Newcastle University has collaborated with the museum to feature some fantastic examples of public participation in research; showcasing social and medical research innovations that have allowed us to understand more about healthy living and healthy ageing over the past seven decades.

In July 2018, colleagues working in the field of dementia and Alzheimer’s will be attending the Alzheimer’s Disease International’s (ADI) 33rd Conference in Chicago. At this event, we’re very excited to launch our film on dementia care and support. This film was part of ITN Productions, starring researchers at Newcastle University, and it was made specifically to open the ADI Conference.

As mentioned, the NIHR Newcastle Biomedical Research Centre has begun to make progress in driving improvements in clinical research to ensure that we achieve a greater representation of older people in trials, so we are fully aware of issues faced by all age groups. With Newcastle leading in this area through the recent recruitment of Miles Witham, Professor of Clinical Trials in Older People, we look forward to being able to learn more and more about older patients and the public, in order to support better changes in healthcare for all.

We’ve also just received the results from the James Lind Alliance Priority Setting Partnership on Multiple Conditions in Later Life. The top ten priorities in this area were launched at a special event involving the public in May, and now we look forward to working together with Newcastle University colleagues, as well as the NIHR, on research that can support the ten priorities that were decided by the public, patients and healthcare professionals.