

<b>Institution: Newcastle University</b>
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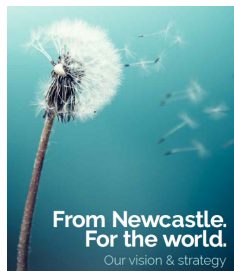
<b>1. Context and mission</b>
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*Whether preventing crippling mitochondrial diseases, winning prizes for poetry and art, integrating renewable energy for zero-carbon transport, steering evidence-based rejuvenation of rural economies, making sense of real-time data for businesses and communities during the Covid-19 pandemic, or discovering a diet to reverse diabetes, **Newcastle University is a place where physical and social cohesion means our research is connected** - between diverse participants, to acknowledged excellence in teaching, with its end-users, and through our international campuses.*

- 1.1. **Newcastle University (NU) is both a globally-recognised research-intensive university and an anchor institution in the North East of England.** From our origins in the 1830s, we have built a proud legacy of education, research and innovation orientated towards the region's maritime, industrial, cultural, agricultural and healthcare needs. This legacy underpins our founding membership of the UK Russell Group and north-of-England N8 Research Partnership, and is represented today in [thematic strengths](#) in Ageing & Life Sciences, Data, OnePlanet, Cities & Place, and Culture & Creative Arts.
- 1.2. Operating from campuses in the UK (Newcastle upon Tyne and London), Singapore, and Malaysia, NU holds TEF Gold and hosts students from >140 countries studying >50 subject areas. Since 2014 the University has grown in turnover from £405M to £571M pa, research income from £93M to £109M pa, and student numbers from ~22,800 to >29,000, including ~2,000 postgraduate research (PGR) students. In parallel with £407M capital investment, NU has expanded its staff, with FTE for Teaching & Research and Research-only contracts increasing by 11% to 2,276, of whom all independent researchers are returned to REF2021.
- 1.3. The University has **three Faculties**: Humanities and Social Sciences (HaSS), Medical Sciences (FMS), and Science, Agriculture and Engineering (SAGe). Each comprises academic units: 18 Schools with a disciplinary focus and 3 Institutes for researchers sharing methodologies. All are based in Newcastle city centre within a 15-minute walking radius. The Singapore campus (opened in 2008, with a 1000m<sup>2</sup> Research & Innovation Institute added in 2017) is focused on engineering. The Malaysia campus was opened in 2009 to provide a medical school. The London site, affiliated with the NU Business School in HaSS, opened in 2015 near the City of London. We continue to diversify our disciplinary base, having re-established Physics in 2015, launched Sports & Exercise medicine in 2017, and incorporated Pharmacy and Medicine from Durham University in 2017. This submission to REF2021 includes all UoAs returned in REF2014 and an additional submission in UoA20.
- 1.4. In 2019/20, NU contributed >£1bn to UK GDP and supported 16,390 UK jobs (source - Oxford Economics). NU is, by some margin, the largest research organisation in the North East of England, employing >6,000 staff (27% from >90 non-UK countries) and holding ~60% of the region's HEI research funding. NU makes an indispensable contribution in a region where 38% of R&D spend is within universities (UK average ~25%) and 23% is within NU alone.
- 1.5. In international rankings, NU has achieved 78<sup>th</sup> in Leiden, 141<sup>st</sup> in QS, and 171<sup>st</sup> in THE. In THE Impact rankings NU is =11<sup>th</sup> globally and =3<sup>rd</sup> in the UK. Three strengths at NU – Sustainability, Ageing and the Rural Economy – have been awarded Queen's Anniversary Prizes for Higher and Further Education.

**2. Strategy**



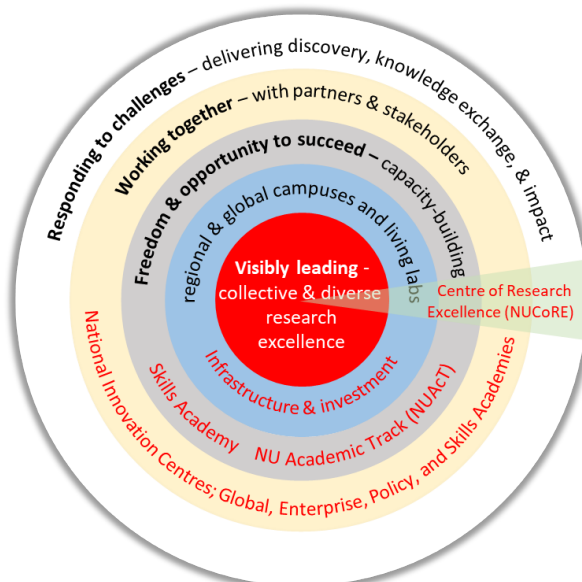
*Implementing our 2018 Vision & Strategy we created the first 10 Centres of Research Excellence spanning all 3 Faculties, appointed the first 29 of 100 Academic Track Fellows, launched Skills and Enterprise Academies to underpin our work on research culture and build on the success of Policy and Global Challenges Academies, extended our portfolio of shared campuses and living labs, and led major national initiatives with new industrial partners.*

**2.1. Strategic goals**

2.1.1. From 2009-17, NU’s strategy set our ambition as a ‘civic university with a global reputation’ and stressed our dual commitment to research and impact under the motto ‘Excellence with a Purpose’. Research was fostered within disciplinary units and in three cross-cutting ‘Societal Challenge Theme Institutes’ in Ageing, Social Renewal and Sustainability. Impact was catalysed through deep partnerships (e.g. with NHS Trusts, local government, Tyne & Wear Archives & Museums, and Siemens) embedded in shared city-centre campuses such as the International Centre for Life (with NHS) and Helix (£350M joint venture with Newcastle City Council and Legal & General).

2.1.2. In 2018, NU launched a new **‘Vision & Strategy’** that incorporates **Research for Discovery & Impact** integrated with **Education for Life, Engagement & Place** and **Global** strategies. This sets NU’s **ambition** for growth in research power (i.e. capacity) and intensity (i.e. resources) to 2025. It specifies **priority actions** to capitalise on the alignment between NU’s attributes and UK imperatives, notably multidisciplinary, diversity, capacity-building, economic leverage and internationalisation. NU has positioned itself at a scale that is big enough to sustain all the disciplines needed to address major challenges, but small enough to work cohesively across the University and with partners. Our future priorities are driven by this ‘one University, without walls’ philosophy, and captured in four **guiding principles**: ‘visibly leading’; ‘working together’; ‘[giving people] freedom & opportunity to succeed’; and ‘responding to challenges’, which we follow in service of **strategic aims**:

- to nurture excellent research and innovation that expands fundamental knowledge, addresses societal and global needs, supports sustainable economic growth and promotes health and well-being;
- to equip staff and students at all career stages with the skills to contribute to research and development in the academic, commercial, public and voluntary sectors; and
- to foster inter-disciplinary approaches and partnerships with businesses and external agencies that extend the reach and impact of our research.



**2.2. Enabling structures**

2.2.1. Evolving from the three pan-university Societal Challenge Theme Institutes (2010-2017) and a portfolio of 38 University Research Centres based within disciplinary units, we have configured **NU Centres of Research Excellence (NUCoREs)**. These epitomise our 2018 Research Strategy, building upon existing research excellence - whether individual or collective - and growing challenge-led research teams that are diverse in disciplinary backgrounds, career stages, career pathways and protected characteristics and that draw upon all the resources of the institution and our partners. NUCoREs are developed ‘bottom

## Institutional level environment template (REF5a)

up' through workshops (>1,000 attendances to date) and iteration involving researchers and professional services colleagues from across the University. By definition, they do not align with singular REF UoAs, although several have evolved from mono- and multi-disciplinary networks and themes within Faculties.

2.2.2. The NUCoRE portfolio is dynamic, and we anticipate ~20 will be operating during the next REF cycle. Initial NUCoREs align strengths at NU with both Local and UK Industrial Strategies and/or funding agency priorities: Energy; Data; Cancer; Cities; Heritage; and Ageing Inequalities. Others represent new groupings to shape interdisciplinary responses to pressing challenges: Regulatory Science; Healthier Lives; Climate & Environmental Resilience; Rare Diseases. Several are already leading national and international networks, e.g. the EPSRC Centre for *Energy* Systems Integration, *data* visualisation for the Alan Turing Institute, the CRUK *Cancer* Centre, and NU leadership of 3 of the 24 European *Rare Disease* Networks.

2.2.3. Our 'one-university' approach draws on research excellence nurtured within **Faculties**, where agility to work across disciplines and consolidate diverse teams has been facilitated by simplifying structures. SAgE rationalised from 9 to 4 disciplinary Schools in 2017. FMS rationalised in 2019 from 6 to 3 Research Institutes and complemented these with faculty research Themes, some of which will develop into inter-faculty NUCoREs. In HaSS, 9 disciplinary Schools are retained but 3 Research Institutes were formed to support Creative Arts & Practice, Social Sciences, and Humanities. The approach includes **Professional Services**, with previously devolved appointments consolidated into two line-managed networks: Research Strategy & Development (hosting the Newcastle Joint Research Office with NHS partners); and Business Development & Enterprise.

2.2.4. To facilitate **impact**, in addition to the approaches that are common across research-intensive institutions (4.1.5), NU has pioneered a distinctive model of **National Innovation Centres** (NICs), initiated for *Data* and *Ageing* in 2016 (£35M from BEIS/EPSC/MRC and £35M from NU), and extended for *Rural Enterprise* in 2020 (£3.7M Research England Development fund). These provide domain-specific experts who connect researchers with businesses, and a physical environment in the award-winning Catalyst building on the Helix campus which is designed for academic-commercial-government-public 'quadruple-helix' co-location and collaboration. For example, NIC-Data has engaged ~5,000 individuals from ~400 organisations resulting in 60 workshops and 40 collaborative projects.

2.2.5. To ensure that we nurture research culture and skillsets, we established **NU Academies**:

- The **Policy Academy** fosters engagement with policymakers for cohorts of academic and professional services staff, including working with NU's seconded government advisors (Blyth, DfT; Stead and Dawson, DEFRA; Bonnett and Phillipson, BEIS). NU has notable strengths in evidence synthesis to inform policy, e.g. through our NIHR-funded portfolio (2.4.4).
- The **Global Challenges Academy** deploys ~£1.4M pa ODA-QR to support region- and topic-focused networks of NU researchers with partners in LMICs. It has hosted 570 researchers at events, established networks (e.g. Ageing, Agrifood Security, Creative Practice for Development, Global Mental Health, HIV Stigma, Nutrition and Health, Sustainable Livelihoods, Tropical Peatlands, and Urban Futures), and supported >100 grant applications including two of 12 UKRI GCRF Hubs awarded in 2019 (Living Deltas and Water Security & Sustainable Development; £35M), thereby connecting 94 organisations from 25 countries and drawing on expert architects, artists, engineers, geographers, historians, physical scientists, and social scientists.
- The **Enterprise Academy** imbues skills for commercial engagement and impact amongst professional services and academic colleagues.
- The **Skills Academy** leads the development of researchers at all career stages in academia and beyond, and the evolution of our inclusive research culture (3.2).

## Institutional level environment template (REF5a)

### 2.3. Enabling governance

- 2.3.1. Responsibility for vitality and sustainability of research and impact rests with the University and Faculty **Research & Innovation Committees**, chaired by the **Pro Vice Chancellor** (Research Strategy & Resources) and **Faculty Deans** of Research & Innovation, respectively. To facilitate knowledge exchange and the 'one-university' goals of the NU Vision & Strategy, we appointed **University Deans** with cross-sector experience, e.g. for: Innovation & Business; Research Culture & Strategy; Culture & Creative Arts; Lifelong Learning & Professional Practice; and Equality, Diversity and Inclusion. Dedicated groups co-ordinate alignment with UNSDGs, Knowledge Exchange & Policy, and Intellectual Property & Spin-outs.
- 2.3.2. Supporting best practice and thought leadership in **research integrity** and **reproducibility**, we appointed an expert convenor and Special Interest Group for Ethics & Integrity, joined the [UK Reproducibility Network](#), maintain policies and procedures compliant with the Concordat to Support Research Integrity, subscribe to UKRIO, and are members of the Russell Group's Research Integrity Forum. Our Research Management System is integrated with ethical approval procedures and includes a check of participation in appropriate on-line or face-to-face training. Faculties conduct an annual audit of ethics compliance. In this REF cycle we completed 12 investigations of allegations of research misconduct resulting in three recommendations for additional training, two published errata, and two retractions of publications.
- 2.3.3. Committed to **open research**, we implemented technologies to facilitate access to **publications** and **data**, supported by specialist library staff. NU's Current Research Information System allows easy upload to the [e-prints repository](#) (>376k views and >41k downloads by >168k users in 2019). RCUK/UKRI and COAF open-access funding of £5.2M in this REF cycle, subsidised by NU funds, has increased outputs fulfilling open-access criteria from 73% to 88%. NU subscribes to Knowledge Unlatched (>1500 open-access books and 30 journals), Open Book Publishers (186 titles), the Open Library of Humanities (27 journals) and Ubiquity Press. NU has invested in a [Research Data Repository](#) powered by Figshare (48k views and 9k downloads in first year) to make data FAIR (findable, accessible, interoperable and reusable).

### 2.4. Enabling Partnerships

- 2.4.1. Consistent with our research being connected with its end-users, in Higher Education Business and Community Interaction Survey 2019, NU scored particularly well for cultural engagement (museums and exhibitions, 4<sup>th</sup> in UK), spin-out company formation (5<sup>th</sup>), and collaborative research value (NHS and commercial, 3<sup>rd</sup>).
- 2.4.2. **Regionally**, NU has joint governance structures with the CQC-rated-outstanding acute and mental health NHS Trusts (one of 8 NIHR Academic Health Science Centres), the City Council, and the North of Tyne Combined Authority, and is represented in the North East Local Enterprise Partnership (NELEP) and Chamber of Commerce amongst many other organisations. NU runs the Great North Museum and Hatton Gallery with Tyne & Wear Archives & Museums, and is a partner in Seven Stories - The National Centre for Children's Books. Collaborative programmes initiated by NU include Newcastle City Futures, interacting with 190 organisations and 145,000 citizens on 70 demonstrator projects leveraging £22M in funding. There is also a highly popular programme of [events](#) to engage the public with NU research.
- 2.4.3. NU has numerous joint programmes with **regional universities**, notably: the Northern Accelerator ERDF/CCF award to four North East universities which has underpinned the region's growth of spin-out companies (NU formed 18 spin-outs since 2013/14, raising £8m investment and now employing 173 people with £7m turnover); the Arrow ERDF programme to facilitate collaboration with SMEs; the AHRC Creative Fuse partnership supporting creative, digital and IT firms in a sector where the region is the fastest growing in the UK; and several shared doctoral training programmes (3.2.2). NU also collaborates across the North of England, notably as lead for the UKRI-sponsored Northern Health Sciences Alliance and founding member of the **N8 Research Partnership** (with Durham, Lancaster, Leeds,

### Institutional level environment template (REF5a)

Liverpool, Manchester, Sheffield and York). Major N8 programmes include the £16M AgriFood Resilience Programme, £7.5M Policing Research Partnership with 11 forces, £1.25M DecarboN8 programme to accelerate adoption of low-carbon transport, and shared high performance computing and centre of excellence in Computationally Intensive Research.

2.4.4. **Nationally**, NU's leadership is exemplified in Table 1.

Table 1. NU contribution to national assets		
RCUK/UKRI	NIHR	Others
EPSRC Centre for Energy Systems Integration	Academic Health Sciences Centre	Arts Council National Portfolio organisations: Bloodaxe Books; Northern Stage; NewBridge Project; National Centre for Children's Literature (Seven Stories)
EPSRC - National Innovation Centre for Data	Applied Research Collaboration North East & North Cumbria	Alan Turing Institute
EPSRC UK Collaboratorium for Research on Infrastructure of Cities	Biomedical Research Centre (2nd renewal 2017)	Cancer Research UK - Cancer Centre
EPSRC Digital Economy Research Centre	Blood and Transplant Research Unit	Faraday Institution
Innovate UK/Cell and Gene Therapy Catapult – Northern Alliance Advanced Therapy Treatment Centre	Centre for Technology Assessment Review	Fera – Institute for Agri-Food Research and Innovation
Innovate UK – Driving the Electric Revolution Centre	Centre for Translational Research in Public Health (Fuse); School of Public Health Research	Health Data Research UK – Northern hub
MRC - National Innovation Centre for Ageing	Clinical Trials Unit	National Agritech Centres for Crop Health and Protection and Innovation and Excellence in Livestock
MRC Centre for Ageing & Vitality	Health Protection Research Unit	National Centre for Cybersecurity – Academic Centre of Excellence
MRC/EPSRC Molecular Pathology Node	In vitro Diagnostics Co-operative (MIC)	Nesta Creative Industries Policy & Evidence Centre
MRC Centre for Neuromuscular Diseases	Innovation Observatory (with NICE)	Versus Arthritis - Research into Inflammatory Arthritis Centre
MRC/Versus Arthritis Centre for Integrated Research on Musculoskeletal Ageing	Policy Research Units: <ul style="list-style-type: none"> <li>• Behavioural Science</li> <li>• Older People and Frailty</li> <li>• Public Health</li> </ul>	Wellcome Trust - Centre for Mitochondrial Research (renewed 2016)
Research England E3 – Hub for Biotechnology in the Built Environment	Research Design Service, North East and North Cumbria	
Research England - National Innovation Centre for Rural Enterprise	School of Primary Care Research	

2.4.5. **Internationally**, in addition to extensive research collaborations (57% of NU outputs have international co-authors), NU holds >240 formal partnerships across 46 countries and disproportionately high EU funding (15% at peak vs national average 11%; 173 EU partners; e.g. leading 3 of 24 European Rare disease Networks, two large IMI programmes [LITMUS; MOBILISE-D] and prominent in two transport consortia [ECTRI; ERTICO]). A smaller number of **strategic institutional partnerships** are prioritised where they play to NU strengths and/or to our geographical focus defined by the NU Global Challenges Academy (2.2.5) and campuses in South East Asia:

### Institutional level environment template (REF5a)

- Monash University, Australia (e.g. Research England I3 award for joint fellowships);
- Xiamen University, China (joint Confucius Institute; founding members of the University Consortium of the 21<sup>st</sup> Century Maritime Silk Road);
- University of Groningen, The Netherlands (20 shared EU projects, notably in Ageing and place-based research);
- Indian Institute of Technology, Delhi and - through the NU-led GCRF Hub for Water Security and Sustainability (£17.3M) and additional joint fellowships - with a network of Indian institutions, tackling UNSDGs;
- through NU campuses in Singapore and Malaysia with University of Malaya, Nanyang Technological University (NTU), National University of Singapore, and the Singapore Agency for Science, Technology and Research (A\*STAR)(60 joint PhD studentships in Singapore; 3 visiting professors at NTU in Ageing and Energy);
- RENKEI Network with Osaka and Kyoto Universities, Japan (NU leads on Climate Change).

2.4.6. For **industry partnerships** we prioritise those held by the National Innovation Centres (2.2.4) and deeper relationships with companies who share our 'living labs', including Siemens (Principal Partnership status, one of 12 universities globally), Dyson (EPSRC Prosperity Partnership Fund, £5.5M), Procter & Gamble (Accelerating Circular Economy centre sponsored by North of Tyne Combined Authority, £2.7M), Nissan (ISCF wave 3 Driving the Electric Revolution, £33M), Northumbrian Water (digital twinning for flood management), Northern Gas Networks and Northern Powergrid (Integrated Transport Electricity Gas Research Laboratory – InTEGReL, a shared Gateshead campus), British Engines (Tyne Subsea pressure testing facility, £9M), and Legal & General (Helix campus). With pharma companies, we hold strategic partnership programmes with Astex, GSK (EMINENT £8M MRC programme), and Genentech as well as multiple joint projects with Pfizer (n=8 EU projects), Novartis (n=9), AstraZeneca (n=5), and Janssen (n=8). NU has frequently been in the top 10 in the UK for Innovate UK Knowledge Transfer Partnerships (KTPs).

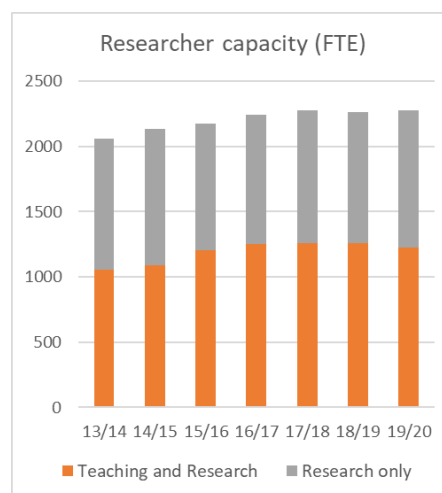
**3. People**



*“I applied to NUAct to start my own independent lab at a world-class university which supports the increasingly interdisciplinary nature of research and maintains a collegiate and inclusive environment. The fellowship will give me the time, space and resources to establish a really exciting program.” Dr Adam Wollman, NUAct Fellow 2019*

**3.1. Staffing strategy**

3.1.1. The **NU researcher community** has grown since 2014 to: 1,922 PGR students (+14% by 2018); 1,142 postdoctoral research associates and assistants; 1,288 independent researchers (+15%); 552 technicians and technologists (+12%); and 1,318 professional service colleagues who contribute 514 FTE to research (Cubane data, 2018). NU emphasises parity of esteem for academic, professional, and non-academic research roles; accordingly, and to increase diversity in our leadership, we have appointed 10 full and 14 visiting Professors of Practice non-academic experience including local government, education and business. Notably, in 2016 NU was awarded both a unique Regius Chair in Ageing and a UNESCO Chair in cultural property protection.



3.1.2. The UK ambition to grow R&D spending to 2.4% of GDP will require ~60% increase in active researchers, mostly outside of academia. Arguably, the limiting factor is retention rather than recruitment. Our **strategic goal** by 2025 is to grow researcher numbers at each career stage by 20% and to increase retention in research for >10 years by 60%. Our approach follows the inclusive guiding principle of giving people ‘freedom and opportunity to succeed’, emphasises choice of career pathways across sectors, and invests in innovative posts to overcome career bottlenecks for retention (e.g. 3.2.4).

3.1.3. The ‘guiding principles’ of our Research Strategy speak directly to the further development of **research culture** at NU (see 2.1.2).

**3.2. Researcher development**

3.2.1. Taught programmes at NU are research-led and often include substantive research projects. To inspire students to participate we innovated with ‘discover research enrichment weeks’, attracting >650 undergraduates to explore research topics and careers, led by multi-disciplinary NUCoREs.

3.2.2. **Doctoral training** is overseen by a Doctoral College and delivered in cohort programmes (e.g. Table 2) supplemented by individual studentships, including 58 PhDs sponsored by the NU ‘Research Excellence Academy’ scheme (REA, £14.6M, 2014-19; 4.1.3). Bespoke training is encouraged through 1+3 year, 3.5 year and part-time options. A comprehensive PGR development programme is linked to the University’s e-portfolio system, highlighting employability skills and attributes within the Graduate Skills Framework and imbuing the importance of research culture, ethics, integrity, and inclusivity. Collective activities include student-led annual [PGR conferences](#) and a [science magazine](#). In the Postgraduate Research Experience Survey (PRES, March-May 2019), NU scored highly for participation (53% versus 42% nationally) and overall satisfaction (83.9% versus 80.7% nationally), led the Russell Group for Supervision and Progression, and was top-quartile nationally for 7 of 9 domains.

Table 2. RCUK/UKRI CDTs and DTPs at NU
<ul style="list-style-type: none"> <li>• AHRC Northern Bridge</li> <li>• BBSRC DTP</li> <li>• ESRC Northern Ireland and North East</li> <li>• MRC Discovery Medicine North</li> </ul> <p>NERC:</p> <ul style="list-style-type: none"> <li>• One Planet</li> <li>• IAPETUS (Environmental and Earth sciences)</li> <li>• Data Risk and Environmental Analytical Methods</li> </ul> <p>EPSRC:</p> <ul style="list-style-type: none"> <li>• Cloud Computing for Big Data</li> <li>• Digital Civics</li> <li>• Geospatial Systems</li> <li>• Diamond Science &amp; Technology</li> <li>• STREAM (Water)</li> <li>• Molecular Sciences for Medicine</li> <li>• Renewable Energy Northeast Universities</li> <li>• Water Infrastructure &amp; Resilience</li> <li>• Offshore Wind Energy and the Environment</li> <li>• Sustainable Electric Propulsion</li> </ul>

3.2.3. **Post-doctoral training and career development** is overseen by a dedicated committee. NU is committed to the Concordat to Support the Career Development of Researchers and was one of the first awarded a HR Excellence in Research Award by Vitae in 2010 (renewed twice since). Mentoring is supported by a NU scheme, postdoc societies in each Faculty, and staff networks (3.4.2). A dedicated Careers Advisor supports postdoctoral associates, including through a Transitions programme for those seeking careers in other sectors. NU has invested in retaining this cohort through the REA (42 posts; 4.1.3), Faculty Fellowships (38 posts) and bridging funds (>150 awards) and has recently converted >200 fixed-term to open-ended contracts.

3.2.4. Recognising the career bottleneck for postdoctoral researchers **transitioning to independence**, and their needs for mentorship and time to develop a research niche, NU launched Newcastle University Research Fellowships (NURFs) in 2014, making 30 appointments (27 in biomedicine and 3 in computing). Such was their success (80% retained in research) that NU committed £30M from 2018 for a **Newcastle University Academic Track (NUAcT)** scheme to recruit 100 fellows over 5 years. Each fellow has 5 years FTE to focus on research - with start-up funds, a PhD studentship and support for mobility and momentum, e.g. during parental leave - before default progression to a faculty post. This progression is also offered to equivalent externally-funded fellows. NUAcT is distinct from similar UK schemes since recruitment will be sustained long-term, the cohort encompasses all disciplines, joint appointments with external partners are encouraged ('NUPAcT' fellowships, e.g. with Astex and Dyson; and the Research England I3 award for 'NUMAcT' fellowships with Monash University), and there is a focus on research culture, e.g. with an equality, diversity and inclusion and workplace culture statement assessed for every candidate. NUAcT is remarkably popular, with >1,400 applications from ~70 countries to the first two annual calls.

3.2.5. The NU Organisational Development unit supports researchers making the **transition to leadership**. A PI development programme introduces leadership and management; PI Essentials clarifies roles and responsibilities under the Concordat (70 attendees in 2019); and Professors' Induction facilitates networking amongst NU leaders. Since 2018, 86 colleagues have participated in leadership training provided by blended in-house/out-sourced group/individual training and coaching.

3.2.6. For **technicians**, NU has a dedicated oversight group and TechNet local network, has signed the Technicians' Commitment, is affiliated with the National Technicians Development Centre and hosted the Technician Partnership Conference in 2020. NU technical staff have held



## Institutional level environment template (REF5a)

grants as PI, won the 2019 Papin prize at the UK HE Technician Summit and been shortlisted for the THE Outstanding Technician of the Year.

3.2.7. **Promotion** is supported on research & innovation as well as teaching & research pathways, with ~10% applying each year and >70% successful. As signatories of the San Francisco Declaration on Research Assessment (DORA) we do not use journal impact factors, nor do we use REF internal or external quality assessments, to assess individuals' performance.

3.2.8. **Sabbaticals** have been taken by 268 (>20%) academic colleagues in this REF cycle.

### 3.3. Researcher wellbeing

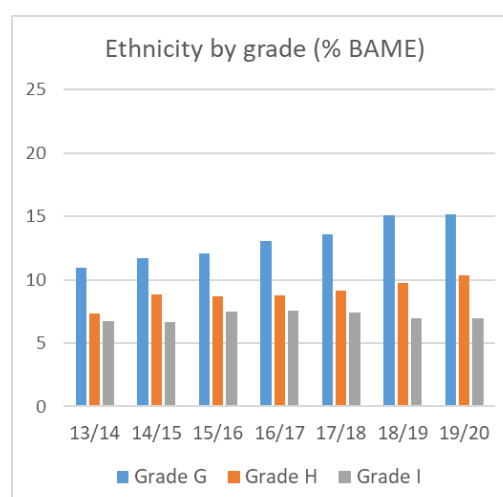
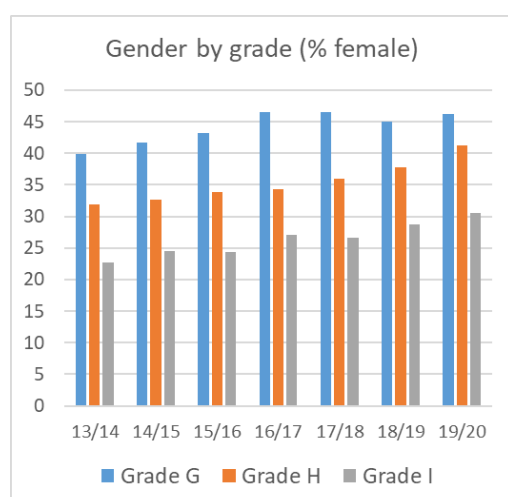
3.3.1. **NU policies and services** in support of researcher health and wellbeing include an employee assistance programme (EAP) to ensure staff and families access services such as occupational health and counselling; EAP responded to >970 helpline calls last year. Policies support flexible and remote working, with 328 researchers working part-time (+15% since 2014). NU was the first university to sign the 'Employer with Heart' charter which supports staff who have premature babies, has removed the qualifying service period for Emergency Leave and Time off to Care for Dependents, and joined Employers for Carers.

### 3.4. Equality, Diversity and Inclusion (EDI)

3.4.1. EDI is a core value of the University. NU's [Equality Strategy](#) is a public commitment to develop a fully inclusive community of talented staff and students from all sectors of society equally. It sets out how we will follow best practice and fulfil duties defined by legislation. EDI principles are embedded at all levels, with implementation supported by a university Dean and a Head of EDI, and by faculty EDI Directors and Diversity Officers. The EDI team contributed to the writing and implementation of the NU REF2021 Code of Practice.

3.4.2. **Delivery mechanisms** include an EDI Fund (35 projects funded since 2017), provision of training (e.g. on unconscious bias, active bystander, and white privilege), a Returners Programme (£150k annually, supporting 19 female researchers to date to regain momentum following extended leave), and staff networks (NUWomen, NUParents, BAME network, Disability Interest Group, Rainbow@Ncl and a nascent NUCarers network).

3.4.3. NU is viewed as a sector leader for **gender** equality and inclusion as evidenced by external funding (OfS, HEFCE Catalyst Fund, Wellcome) and engagement activities. Earlier success in increasing the proportion of females amongst early-career researchers (ECRs) is now flowing through to higher grades (Figure). 30% of our Professors are female (Russell Group average 25%), as are 41% of Heads of Unit (up from 23% in 2013-14), although we still have a priority to accelerate closing the gender pay gap (GPG, which reduced for 4y in succession to a mean of 18.1% in 2020, ranked 8<sup>th</sup> amongst English Russell Group universities; GPG for non-clinical professors has fallen from 4.5% to 2.9%). NU was awarded institutional Athena Swan Silver status in 2016 and 2020. FMS is one of only 5 nationally to hold a Faculty Silver Athena Swan award and we have 12 Bronze awards in other Faculties.



## Institutional level environment template (REF5a)

3.4.4. Our commitment to EDI goes beyond gender. We became a Stonewall Global Equalities Champion (2016), a member of the Business Disability Forum (2017), joined the Race Equality Charter (2019), and provide Sanctuary Scholarships and support for At-Risk academics. Since 2014, we have invested £2.25M (£874k for research facilities) to improve access for colleagues with a disability. Representation of colleagues identifying as BAME has increased amongst ECRs but is an outstanding priority for the professoriate (Figure).

### 4. Income, infrastructure and facilities



*Newcastle University's city centre campus spans everything from a university art gallery and museum, hospitals for adults and children, a growing innovation district, the most detailed real-time urban sensor system in Europe, and experimental water drainage systems, all within a 15-minute walking radius. The resulting physical and social cohesion is key to our success.*

#### 4.1. Enabling finance

4.1.1. **Transparent Approach to Costing** (TRAC) methodology demonstrates that spending on research has increased since 2014 from £166M to £212M p.a., with £105M income from external grants and contracts, £29M from QR, ~£8M in other research-related income, and a 'cross-subsidy' of 33% from non-research related income. For PGR students, expenditure has increased from £39M to £57M with income of £28M and cross-subsidy of 52%. Exceptional income from **philanthropy and licencing** of intellectual property has increased, in particular with multi-million pound donations in support of architecture and design, ageing, environmental sustainability, and neuroscience, and monetisation of licence fees from Rucaparib, one of two approved anti-cancer drugs developed at NU.

4.1.2. NU's **capital investment programme** draws on the accumulated operating surplus of the University and relatively low borrowing (£150M EIB loan). During this REF cycle NU has committed £255M to capital projects involving research (4.2).

4.1.3. **University-wide non-capital investments** of >£100M include: a Research Excellence Academy (REA, £14.6M, 2014-19) directed at ECRs (3.2); a Research Investment Fund (RIF, £30M, 2014-21) directed at targeted pump-priming, senior appointments and infrastructure (e.g. seeding the Research England E3 £8M award for the Hub for Biotechnology in the Built Environment with Northumbria University); the NUAcT scheme (£30M, 2018-23; 3.2.4); a university-level Research & Innovation budget (£5.6M, 2014-20) directed at cross-disciplinary activities and external partnerships including NU research clusters (Societal Challenge Theme Institutes, University Research Centres, NUCoREs (2.2), NU Academies (2.2.5), and N8 Research Partnership (2.4.3)); and support for the National Innovation Centres (£20M, 2017-2027).

4.1.4. **Faculty investments** include c.£750k p.a. in pump-priming, impact acceleration, EDI and other initiatives that leverage external portfolio awards of ~£3M p.a. (e.g. Wellcome Institutional Strategic Support and Translational Partnership funds).

4.1.5. For **Knowledge Exchange and accelerating Impact**, the Higher Education Innovation Fund (HEIF, ~£4.6M p.a.) is deployed proactively to facilitate delivery of our Knowledge Exchange (2016-2021) and Engagement & Place strategies and supports:

- the NU Business Development and Enterprise team (technology transfer, consultancy, company creation, corporate engagement, and KTPs);
- projects with businesses (2.4.6), notably creating shared facilities (4.2.1) and consolidating clusters for ISCF and Strength-in-Places funds (e.g. ISCF wave 3 project Driving the Electric Revolution with Nissan and a host of industrial partners; North-East partners proposed this challenge to BEIS and NU now leads it nationally);

## Institutional level environment template (REF5a)

- impact acceleration accounts (IAAs) supplementing ESRC and EPSRC IAAs and MRC Proximity-to-Discovery and Confidence-in-Concept funds. Managed with external advisors, activities include secondments to and from industry, pump-priming ideas to impact, an Action-for-Impact immersive training programme for researchers, and challenge-focused workshops with industry;
- engagement with policymakers, e.g. through the NU Policy Academy (2.2.5), and subsidised in 2019-20 by £1M QR-SPF from Research England which will support a new Policy & Evidence Hub.

4.1.6. **Research reproducibility** and **data repositories** are discussed in 2.3.

## 4.2. Infrastructure

4.2.1. NU's **campus developments** reflect the strategic emphasis on working across disciplines and cheek-by-jowl with external partners. For example:

- a joint venture with Newcastle City Council (NCC) and Legal & General on the £350M 'Newcastle Helix' (previously 'Science Central') 24-acre city-centre innovation campus. NCC has opened the Core, Lumen and Biosphere incubators and NU has opened the £1.4M Key building (engagement space for data science), £58M Urban Sciences Building (computing science, Siemens Mindsphere digital twinning lab, data visualisation suite as lead for Alan Turing Institute, and £2M energy storage living lab), £40M prize-winning Catalyst (National Innovation Centres and NIHR Innovation Observatory), and £33M Frederick Douglass Centre (education and conferences);
- purchase from the NHS of the 29-acre Campus for Ageing & Vitality (£8M), where existing university facilities for multi-modal imaging, ageing research and CRESTAs (Clinics for Research and Service in Themed Assessment) will be extended as a living lab for healthy ageing innovation and substantial future expansion of multidisciplinary research;
- construction, adjacent to the medical Faculty and Royal Victoria Infirmary, of the £39M Dame Margaret Barbour building and £21M Sports Centre, housing education and research facilities for sports & exercise medicine, human nutrition and psychology;
- co-development with British Engines of the Camperdown facility north of Newcastle as part of the Neptune Centre for Subsea and Offshore Engineering (with one of Europe's only hyperbaric chambers for deep sea component testing, £9M);
- reconfiguration and modernisation of listed buildings including the Sir Henry Daysh complex (~£60M) for Geography, Politics & Sociology and Architecture, Planning and Landscape, and the Armstrong Building (£20M) for Arts & Cultures (including Music), History, Classics & Archaeology, and marine science;
- refurbishments including £3.8M Hatton Gallery (with Heritage Lottery Fund), £5.5M Wolfson Childhood Cancer Centre, £3M immunology facilities, £2M Drummond Building OnePlanet facility (shared earth sciences resources for archaeology, chemistry, biology, geology, and geosciences), £2M state-of-the-art protein mass spectrometry, £1.8M Devonshire Building (co-locating synthetic biology, bioinformatics, and microbial biology), and £2.5M testing rigs for electric motors installed as part of the UK Rail Research and Innovation Network.

4.2.2. NU hosts many additional **specialised facilities and resources**, including:

- two research farms in Northumberland providing living-lab facilities for livestock welfare, crop diagnostic monitoring, the Palace Leas pasture experiment (run since 1896), and sustainable energy solutions;
- bespoke archives, museums and performance spaces, including the University Library rare book and archives collections (IL Archive Service Accredited)(Gertrude Bell Archive awarded UNESCO International Memory of the World status, 2017), Great North Museum

**Institutional level environment template (REF5a)**

Hancock (world-class archaeology, natural history, geology and ethnography collections), Hatton Gallery (NU Fine Art named one of eight most influential art schools globally, 2019), and National Centre for children's literature (through the Vital North partnership with Seven Stories);

- Two marine research stations at Cullercoats and Blyth, the latter housing a Cavitation Tunnel for propellor development and our seagoing research vessel;
- the [Urban Observatory](#) (part of the UK Collaboratorium for Research on Infrastructure and Cities), providing the largest set of publicly available real-time urban data in the UK;
- a powerful constellation of joint NHS and university resources for translational research to improve health and care, spanning molecular, clinical and societal research (see 2.4.4);
- and finally, the landscape and heritage of the North East, where researchers can study floods in Northumberland, Hadrian's Wall, marine and coastal ecology, or the dark skies of Kielder. Vitality and sustainability rediscovered!