

## Unit-level environment template (REF5b)

|  |
|--|
| <b>Institution:</b> Leeds Beckett University   |
| <b>Unit of Assessment:</b> 3- Allied Health Professions, Dentistry, Nursing and Pharmacy |
| <b>1. Unit context and structure, research and impact strategy</b>                       |

**Overview**

This submission draws exclusively from two Schools at Leeds Beckett University (**LBU**); the School of Clinical and Applied Sciences (**SCA**) and the School of Health and Community Studies (**SHC**). Collectively we seek to improve health and wellbeing of the population through impactful research, ranging from laboratory-based biomedical science through to stakeholder-engaged health research aimed at improving health outcomes for people living with some of the major diseases currently challenging society. Our research is focused in four research centres in the areas of biomedical sciences, dementia, obesity and health promotion, and this submission consists of 30 staff from these research centres amounting to 29.2FTE.

**Structure**

Each School is led by a Dean with support from a School Leadership Team. The Director of Research (DoR) has responsibility for research strategy and development within the Schools and reports directly to the DVC for Research. The DoR is responsible for the School's REF submission strategy and works closely with both Deans to ensure a vibrant and sustainable research environment is maintained within SCA and SHC. Health research within the two Schools is strategically aligned with LBU's targeted research theme of *Health and Wellbeing* and is underpinned by research carried out by staff who are members of one of four research centres; Centre for Biomedical Science Research (**CBSR**); Centre for Applied Obesity Research (**CAOR**); Centre for Dementia Research (**CDR**) or Centre for Health Promotion Research (**CHPR**). The CBSR and CAOR are within SCA and CDR and CHPR with SHC. All researchers who are part of this submission are members of one of the four research centres.

The **CBSR** is led by Professor **Jones** and includes three Readers, **de Marcos Lousa**, **George** and **Postis**, as well as members **Galbraith**, **Gomez-Escalada**, **Johnson**, **Lang**, **Milton**, **Paterson**, **Roberts**, **Sabir**, **Sharp** and **Tashani**. Established in 2016, the CBSR coalesces all ongoing biomedical science research into one group and serves as the focal point for strategic investment in laboratory-based health research within the institution. Seven members, including the director, have been appointed during this REF cycle and collectively bring with them a strong publication track-record that has dictated the key research strengths in the centre and determined our PhD recruitment strategy. The institution has committed a significant proportion of QR funding to developing the centre (detailed within income section). The main goal of the centre during this REF cycle has been to establish itself as a key research centre within LBU and to grow its external profile. Members of the centre make a significant contribution in outputs in this REF submission, with publications in leading journals such as *Nature Protocols*, *PNAS*, *Plant Cell*, amongst others. An example of a world-leading contribution to the research field from the centre has been in the purification and structural analysis of membrane proteins using Styrene Maleic Acid Lipid Particles (SMALPs), which has led to a significant adoption of this innovative technology in the field of membrane protein structural biology.

The **CAOR** is a joint research centre between SCA and Carnegie School of Sport (CSS). The centre is co-led by Professor **Ells** and includes one Reader, **Maynard**, and members **Apekey**, **Matu** and **White**. Members of the CAOR whose research is aligned more closely in the sporting arena are located in CSS and are being returned to UoA24. Established in 2017 and following an exhaustive recruitment cycle, **Ells** was recruited in May 2020 to lead this strategically important research centre. LBU and the Leeds region has a long-standing track record in the broad area of obesity research. **Ells** is a recognised world-

## Unit-level environment template (REF5b)

leader in public-health obesity research and will drive the development of the centre forward during the next REF cycle, particularly in the areas of childhood obesity, health inequalities and integrating novel technologies such as eHealth to help fight obesity. Highlighting this key role, **Elli**s has recently won and is leading a £1.5M NIHR grant evaluating the NIHS “Low Calorie Diet” (LCD) initiative [2020-2023]. Members of the centre make a significant contribution in outputs in this REF submission and will be supported to develop impact case studies for future REF exercises.

The **CDR** is led by Professor **Surr** and includes one Reader, **Smith**, and members **Brooks, Burden, Griffiths** and **Kelley**. Other “associate members” of the CDR who are located in other schools [such as built environment, computer science, sport] are being submitted to a broad range of other UoAs. Associate members add value to the CDR through enabling interdisciplinary research projects to grow and develop. There are a number of joint PhD students between CDR members and associate members from other Schools. Established in 2015 with the appointment of **Surr**, the centre has grown steadily since, with internal support from the institution and SHC coupled with significant external grant success. The centre plays a leading role in diverse aspects of improving the lives of people living with dementia and has a number of ongoing projects linked to such. Of particular note is the role of the centre in developing policy and practice in how the dementia care workforce is trained and educated. The impact case study “Dementia” submitted as part of this REF submission, is underpinned by CDR research outputs. The CDR is a world-leader in research aimed at improving the training and education of the healthcare workforce in relation to people living with dementia.

The **CHPR** is co-led by Professor **South** with Professor **Bagnall** and includes one Reader, **Woodall**, and members **GthJones** and **Trigwell**. Other members of the CHPR with a focus on social policy research are being submitted to UoA20. The UoA20 staff provide an element of interdisciplinarity to the CHPR and work closely with their UoA3 colleagues. Established in 1997, the CHPR has a long standing and respected track record in the broad area of health promotion. During this REF cycle the centre has restructured and focused research projects and growth in the key areas associated with community engagement with health and health inequalities. Research carried out by the centre during this REF cycle underpins two impact case studies in this submission, in the areas of community engagement with health and improving health outcomes in the prison system.

### Research and Impact Strategy

The research strategy of the unit is aligned to and underpins LBU’s institutional research theme in *Health and Wellbeing*. In REF2014 LBU submitted to UoA2: Public Health, and the main strategic goals were primarily focused on increasing research capacity and intensity, and importantly, instilling rigour and excellence across the unit in all aspects of our research activity. A key strategic aim was to identify no more than five areas of research strength to act as pillars for investment and future research growth in the area of Health and Wellbeing. Additionally, a key aim was to create a vibrant and supportive research environment across the whole unit that allows **all** our academic staff the opportunity to engage in research and scholarship that is appropriate to their career stage and experience.

### **Achievement of strategic aims 2008-2013:**

- All new academic appointments are now made with research profile of applicants and ability to integrate within the research strategy of the unit, at the forefront of recruitment decisions. Since 2014 there have been a significant number of appointments from Senior Lecturer to Professor in research areas directly aligned to one of our four research centres. In REF2014 we submitted 24.99FTE in the UoA2 submission, which has effectively grown to an equivalency of approximately 40FTE

**Unit-level environment template (REF5b)**

in REF2021. This accounts for the approximately 30FTE in this submission, coupled with members of SCA and SHC working in the area of health policy, being returned in UoA20, who were part of the UoA2 submission in REF2014. Importantly, we have increased and improved the research supervisory capacity and experience of academic staff, and embedded high-quality research support in all aspects of research administration.

- We have improved both the number and quality of our research outputs. Since 2014, the staff submitted within this UoA have published over 400 peer-reviewed journal articles, many in high-impact journals [e.g. Lancet, Nature Protocols, Plant Cell, Proceedings of the National Academy of Sciences USA, Chemistry & Biology, Genome Research].
- We have developed further our relationships with national bodies such as Public Health England (PHE) and the National Institute for Health Care Excellence (NICE) and local government, with many new projects developed in conjunction with Leeds City Council and other councils in the West Yorkshire region. We have entered into new agreements with Leeds Teaching Hospital Trust (LTHT) and Leeds General Infirmary (LGI) and developed new local links through our membership and roles within the Leeds Academic Health Partnership (LAHP). We have developed new relationships with SMEs through our active partnership and activities in the TRANSLATE and Grow MedTech projects (UKRI funded Catalyst Centres), in the Leeds City Region.
- We have increased R&E income by over 50% to excess of £4.0M and we are now competing for and winning more grants from diverse funding agencies, including research councils and other high-profile health research funders.
- We have increased PhD completion numbers by over 50% and more than doubled our currently enrolled PhD student numbers compared to 2014.
- We have focused our research into four research centres. Each centre has professorial leadership and all staff carry out research aligned to targeted and impactful research themes.

Following REF2014 we conducted a critical evaluation of current research strengths across the two Schools and areas of research we wished to grow through targeted external recruitment. As a result, we identified the four research centres across the two schools as focal points for our health research and for targeted investment in research.

**The establishment and development of our four research centres** has been the most significant strategic decision during the current REF period and underpins much of our research strategy moving forward. The unit's research focus links directly into the institutional research theme of *Health and Wellbeing*. We have developed three new research centres, CBSR, CAOR and CDR in this REF period, and focused our health promotion research into the well-established CHPR. The newly established Centres all benefitted from external recruitment of high-quality research professors with additional recruitment of Readers and SLs. Additionally, following an institutional-level decision to invest in STEM and health-related research, the four research Centres have benefitted from strategically targeted QR investment. This has resulted in a confirmed 3-year investment of £430Kpa [2019-2021], with this budget being controlled by the DoR. This step-change in internal investment in research at LBU has allowed the strategic investment in our four health research centres to recruit PhD students and cover associated laboratory costs such as consumables.

**Research strategy 2021-2026**

The key research aims of the unit for the next 5 years are:

**Unit-level environment template (REF5b)**

- Further growth and development of our four health research centres with the ambition to be recognised as world-leading centres of excellence in their associated research areas.
- To recruit and retain excellent researchers working in strategically prioritised areas of public health.
- To improve our research infrastructure for biomedical science research.
- Develop the emerging discipline of musculoskeletal research within the unit into an established research centre.
- For **all** academic staff to be research active and be returned in the next REF exercise.
- Increase our research capability in all strategic areas of health research through recruitment of excellent research students, with a goal of doubling our PG cohort and PhD completions.
- Significantly increase the amount of external research funding coming into LBU to support the prioritised areas of health research, with an ambitious goal of at least doubling our research income.
- Grow and develop our links with external stakeholders with the goal of strategic and meaningful Category C appointments.
- Merge SCA and SHC into one School that acts as a single location for the four research centres and UoA3 research, and promotes cross-School collaboration in health research. This merger aligns with the LBU campus masterplan to integrate our health researchers into newly acquired physical space that will arise during the next REF period.
- Embed impact as the key driver of all our public health research. All our researchers to develop a clear pathways to impact strategy for appropriate aspects of their research programme, and allocation of QR funding to support appropriate training and data collation activities.

LBU has an established reputation in delivering impactful health research. The unit impact strategy is aligned with LBU's mission as a civic university, serving the needs of local and regional constituencies, while promoting impact at national and international levels. We have three major approaches for achieving impact from our research i) promoting collaborative research with diverse stakeholders, and encompassing dissemination events with users; ii) presenting our research at conference and events aimed at practitioners and end users; iii) utilising print, broadcast and social media to engage with the general public about our research. The DoR actively promotes these approaches and can provide financial support through QR-funded schemes if required. These impact strategy principles flow through each of the Impact Case Studies submitted included in this submission. The themes of our case studies are i) engaging local communities in public health; ii) improving health outcome in the prison system and iii) improving dementia care through educating and training the care workers. Each case study required development of collaborative and consultative work with key stakeholders such as PHE, Prison Service and Care Home organisation. Importantly each case study is underpinned by a co-production approach incorporating key stakeholders, such as the general public, in the research process. The participation of target users and beneficiaries of research in the research process itself, is a growing and at times an essential consideration for health research to receive funding support. LBU is a world-leader in co-production as a research approach. Our commitment to supporting and developing our impactful health research is evidenced by the financial support and strategic investment in this research area coupled with key strategic appointments to lead our newly established research centres. Our strategy in promoting the importance of impact to our researchers and developing support mechanisms, is a completely fresh approach compared to REF2014.

## Unit-level environment template (REF5b)

The DoR pro-actively encourages an open research approach across the whole of the unit. LBU has an Open Research policy that aligns with Research England's approach to OA publication and with the RCUK Concordat on Open Research Data. All our researchers are familiar with these policies as they are communicated regularly in forma such as School R&E group meetings [Chaired by the DoR].

Good research governance and practice is encouraged and promoted across the unit at a variety of levels. Each School has a local ethics committee consisting of a School Ethics Coordinator [SREC] who is supported by Local Research Ethics Coordinators [LRECs] who are representatives from each of the research centres. All research at LBU, whether conducted by undergraduate students or staff, is required to submit their research project for ethical approval using our online research ethics systems. The School ethics system feeds directly into the University Research Ethics Sub-Committee [URESC]. In addition to research ethics issues, the URESC also has responsibility and oversight of issues relating to research integrity. Training in research ethics and research integrity are provided through the Graduate School in the form of workshops held twice a year, and also locally in SCA and SHC through the SREC.

During the current REF cycle the unit has undergone a radical change in every aspect of research-associated activity. The significant improvement in every measurable research metric, provides quantifiable evidence for positive change in environment for UoA3 research at LBU. What is difficult to capture in this template is the qualitative aspect of the shift in staff perception and approach to research in our unit, which is vitally important in implementing our research strategy moving forward. The much-improved research environment achieved since REF2014 provides a sound basis for implementing and delivering on the 2021-26 unit research strategy.

### 2. People

During this current REF period, LBU UoA3 research has been transformed into a cohesive unit, focused on areas of strength and expertise. The key to this step change, not only in research intensity, but quality also, has been a robust targeted strategy of recruitment of excellent academic staff, aligned with underpinning financial support from the institution to vastly improve the research infrastructure and PhD student numbers in this strategically important area. A strong base of research excellence and external credibility now exists in our unit and this has laid the foundation for sustained growth and steep upward trajectory of our research activity moving forward.

**Staffing strategy and staff development:** A guiding principle for LBU is maintaining and supporting a “community of great people” who deliver high-quality and impactful research. The Deans of SCA and SHC, work with the DoR of UoA3 to create a dynamic, supportive and inclusive research environment that gives **all** staff the opportunity to develop their research profiles accordingly. Following the restructuring from Faculty to Schools in 2017, research staff within the Schools are aligned with one of our four health research centres. The unit's recruitment strategy has been to appoint high-quality academic staff who are research active and have strong publication track records in an area that aligns with ongoing research within one of our research centres. Additionally, the unit is keen to develop cross-school research within the institution. A prime example of this approach is the recent appointment of **Ells**, to lead the cross-school CAOR. A key strategic goal being to generate a critical mass of excellent academics working in our University-level prioritised research theme areas.

Since 2014 the unit has recruited a number of high-quality research active staff to the CBSR at various academic levels; Senior Lecturers (SLs), **Postis** (2014) and **De Marcos Lousa** (2015), both from University of Leeds, **George** (2017) University of East London, **Lang** (2018) from Glasgow Caledonian, Principal Lecturer **Milton** (2014) from University of

**Unit-level environment template (REF5b)**

Westminster, Course Director **Roberts** (2018) from University of Bradford, and Professor **Jones** (2016) from Maynooth University.

The two other areas of focused recruitment have been in dementia and obesity. The appointment of Professor **Surr** (2015) from the University of Bradford was concomitant with the establishment of the CDR. The CDR has grown with recruitment of two permanent independent research fellows, **Griffiths** (2016) from University of Manchester and **Kelley** (2017) from University of Leeds and recruitment of a Reader, **Smith** (2017) from the University of Bradford. In the area of obesity two SLs were recruited, **Apekey** (2015) from Leeds Trinity University and **Matu** (2018) from the University of Leeds and most recently Professor **Ells** (2020) from Teeside University.

In addition to establishing and recruiting into three new research centres, in 2017 following review, we restructured research within the area of health promotion. A decision was made to focus in the area of community-related public health research, which resulted in the closure of the Centre for Men's Health. This was in line with our research strategy and stated objectives from REF 2014 to focus our health research in key strategic areas of identified strength.

In parallel with an ambitious recruitment strategy, both SCA and SHC have supported academic promotions for researchers within the unit. In 2016 **White** and **Woodall** were promoted to Heads of Nutrition & Dietetics and Health Promotion, respectively. In 2017, **Bagnall** was promoted to Professor, **Postis**, **de Marcos Lousa**, **George**, **Maynard** and **Burden** were promoted to Readers, and **Brooks** and **GthJones** promoted to Course Director roles. In conjunction with Head of discipline as line managers, and through a well-established Performance Development Review (PDR) process, the DoR plays an active role in establishing research goals that are aligned with the career aspirations of staff. The annual monitoring of research progress and providing the appropriate support for achieving research goals, is a key factor in staff development and career progression.

The age profile of the unit is well balanced with a healthy blend of experienced, mid-career and early career staff, with each research centre having Professorial leadership and support from Readers. Newly recruited staff go through a School-level induction process to familiarise with the academic environment at LBU. New staff are assigned a research mentor from that centre to assist in embedding the new staff member into the research group and School research environment. Additionally, the unit is well-supported through a School-level dedicated research administrator and an institutional-level REF Manager with support from a Research Impact Officer.

Importantly, since REF2014 LBU has taken the strategic decision to support research in UoA3 through QR-funded initiatives that aid and underpin the career development of our research active staff. This has resulted in significant investment in the unit and allowed staff to dedicate more time to research activities and, in the case of supporting biomedical sciences staff, to make major strides in investing in infrastructure and equipment. The detail of this support for staff is in the income/infrastructure section.

The DoR and Deans of SCA and SHC additionally support staff development in research through providing funding for conference attendance, research visits, seminar or meeting organisation and Open Access (OA) publications. Typically, across the unit there is approximately £40Kpa allocated to support such activity, which usually means all reasonable [£1-3K] and well-justified staff requests for travel can be accommodated. Again, this funding is through a dual-funding contributions from SCA and SHC and the regular [not strategic] unit QR allocation. LBU and the unit are committed to supporting an OA publication strategy. Staff are encouraged to request publication costs if eligible, as part of all external grant applications. In addition, the DoR sets an annual budget of approximately £20K to support OA publication in biomedical science and health-related journals. Annual OA publication costs for the unit usual land between £10-20K so the majority of requests are honoured, following an internal review and quality control process coordinated by the DoR.

**Unit-level environment template (REF5b)**

Our commitment to supporting OA publication is demonstrated in the purchase of £20K of OA credit in BMC Journals [from 2017- funds exhausted in 2019], and a three-year OA publication deal with PLOS [2021-23].

Amongst the entire staff cohort of SCA and SHC, a significant number have entered academia from a practice-based background, and indeed some staff are still practicing their profession (particularly true in AHPs such as Physiotherapy and Nutrition & Dietetics). This means that many academic staff are yet to acquire a PhD. LBU wants all its academic staff to have PhDs and the Deans of SCA and SHC are contributing to this goal through supporting over 20 academic staff in working towards achieving a PhD. This is a massive investment in research for the Schools paying P/T tuition fees and allocating at least 20% of deployment time for research for each enrolled staff member. The Schools are committed to achieving 100% of staff possessing or being registered for a PhD within the next REF cycle and any staff member can apply to the Dean on an annual basis for PhD funding.

**Equality, Diversity & Inclusion [EDI]:** A guiding principle for the unit is that we are committed to maintaining and developing policies and practices which promote EDI. This principle applies to staff recruitment, retention and development, and in opportunities for staff engagement with research. The approach of SCA and SHC is to allow all staff the opportunity to engage with research activity, regardless of personal circumstances, and in cases where staff are finding this difficult to achieve, to provide realistic and manageable solutions on an individual basis. To achieve this, both Schools have flexible working practices that allow academic staff to manage their time appropriately and to engage with research. Through the PDR process or through *ad hoc* informal discussion between academic staff with the DoR or Deans, flexible deployment arrangements can be made for individuals to facilitate research activity. In 2018 SCA submitted an Athena Swan Bronze application, which was unsuccessful. Although disappointing, the process of gathering the vast amount of information relating to EDI across the School and in relation to our research activity was invaluable in allowing the unit to assess any potential EDI implications with the way we manage and support research within our research centres. The unit is in the process of finalising a resubmission for an Athena Swan Bronze award in the early phase of the next REF cycle. As part of the then developing Athena Swan Bronze Award application, in 2017 both Schools established an EDI Group that meets on a bi-monthly basis to collate, discuss and assess data relating to academic and research activity for staff and students, to ascertain whether our ongoing practices inadvertently disadvantage any members of staff or students. From quantitative and qualitative feedback from staff and students, it appears that any issues relating to the ability to carry out and manage research activity, for example time allocation, are issues that occur for all staff rather than any particular group and nuances exist that affect individuals. Following an EDI assessment of academic staff submitted with this UoA we did not uncover any issues regarding representation across protected characteristics compared to overall staff profile in the Schools or institution as a whole. For example, of the 30 academic staff submitted, 17 are female, 13 male, and there is a broad age distribution across the group, with 5 of the 30 qualifying as ECRs. Additionally, there is excellent gender representation at senior level across the submission with four out of six professors and three out of six readers, being female. An indicator of the success of our individualised approach to research time management is that the UoA has at least four staff who have taken maternity or paternity leave on more than one occasion during the REF cycle. However, even though entitled to request an output reduction, the unit will not do so, and indeed, all of the staff who qualify for reduction have more outputs attributed to them compared to most staff not in those circumstances. This demonstrates that the research environment of our unit provides a high-level of personal support to our academic staff that allows the flexibility to succeed with their research under circumstances defined by Research England as impinging on such.

**Research students:** As a result of our research strategy, PhD completions recorded in our HESA return have grown from 12 in 2014 to 22 in 2021. This is broadly in line with LBUs ambitious goal of doubling PhD student numbers during the last REF cycle. Between 2014-17 PhD recruitment was through a Faculty scheme, which consisted of match-funded studentships with 50% from the Faculty and 50% from central QR. This approach allowed SCA and SHC to recruit 9 PhDs into the unit, with other PhDs funded through a variety of different mechanisms including self-funding, or external scholarships such as Science Without Borders and Jane Tomlinson Foundation [Johnson], or country-sponsored scholarships such as Libya [Tashani]. The move from Faculty to Schools in 2017, as cost centres, has allowed the unit to expand significantly in terms of PhD recruitment through a three-pronged strategic approach:

- a) SCA and SHC have actively supported and promoted a 50-50 match-funded PhD programme with any strategically relevant external stakeholders.
- b) The strategic allocation of QR to UoA3 has allowed the targeted support for PhD recruitment into the four research centres.
- c) The generation of an annual School surplus in funds allows re-investment in new schemes, such as development of a UoA3 PhD doctoral training scheme.

This approach has resulted in a step-change in our PhD recruitment numbers since 2018. Currently, the unit has 12 PhD studentships funded solely through strategic QR [£264K pa], 8 studentships funded through SCA and SHC School research allocations [£176K pa], with another 3 studentships funded through the 50-50 match funded scheme, two with Oppilotech Ltd [SME in London], one with Nature's Laboratory [SME in Whitby], and four others through self-funded or international scholarships. In total we have 28 PhD currently enrolled within the unit through studentships. Coupled with staff-supported PhDs our PGR numbers now approach 50. The unit is committed to sustained PhD recruitment to maintain studentship levels, which will translate to major increases in year on year PhD completions during the next REF cycle. The PhD students have been recruited into each of the four research centres, with biomedical science being the main beneficiary at this stage to match the institutional investment in laboratory infrastructure. The third strategic approach to PhD recruitment is the establishment of the Dean's Scholarship Scheme in SCA. Since 2018 SCA has generated an operating surplus, which has allowed a £376K investment in a PhD doctoral training scheme to recruit at least two PhD students each year for three years. Unfortunately, due to Covid-19 the first recruitment intake to the scheme is now delayed until October 2021.

Each of the unit's PhD students are members of one of the four research centres. Student progress is monitored and supported through a number of mechanisms. Within 6-months of start date, each student must undergo a Confirmation of Registration (CoR). The CoR is a formal and important event, which each candidate must successfully negotiate to continue their PhD registration. The process is challenging and feedback from PGRs has highlighted the CoR as a positive and enriching experience in helping to define and refine key aspects for their research projects moving forward. The process consists of at least a 1-hour viva scenario, with a Chair and two members of staff who discuss the candidate's project and proposed work in much detail. The CoR also provides a detailed training needs analysis for the student to adhere to for their professional development. Following successful completion of the CoR, each student has an Annual Progression (AP) meeting at the end of their first year and each subsequent year. Similarly, the AP is a formal event with a chair and panel, which monitors the progress of PhD projects and ensures we maintain a high-quality of research and our PhD students are supported to keep on track with their work and submit their thesis in a timely fashion. In addition to regular formal monitoring and training

### Unit-level environment template (REF5b)

through Graduate Studies workshops in topics such as research ethics and integrity, each UoA3 PhD student will receive bespoke training through their research centre. Each centre runs a formal seminar series and students present their work during end of year research presentation days, as well as a global unit research day consisting of oral and poster presentations by students from across the breadth of research within the unit. When starting in their designated School, each student undergoes an appropriate induction process to welcome them to the School and research centre, and they also receive a high-specification laptop. Each PhD student receives £1K during the duration of their studies, that they can use to attend conferences and/or workshops or meetings, as required. In addition to this School-level funding allocation, the DoR encourages students and supervisors to submit *ad hoc* travel/meeting funding requests throughout the year, which if approved, can be supported through QR funded schemes.

### 3. Income, infrastructure and facilities

**Income:** The unit strategy is to improve the quality and competitiveness of research grant applications, and to ultimately increase research income during this REF period, focused on the recruitment of excellent researchers to LBU and improvement in training and support in grantsmanship for all our research active staff. Additionally, the introduction of enhanced internal quality-control measures for research proposal review prior to approval of submission, has proven invaluable in supporting staff to develop and submit competitive high-quality research proposals. The HESA-guided returns for 2014-20 show that external research income exceeded £4.0M. This amounts to an approximate 50% increase on the comparable amount reported in REF2014 and reflects both the success of LBUs recruitment strategy and support for researcher development in the area of health research, during this REF period. While maintaining research income levels from sustained supporters of our research activity, importantly our research income has diversified since 2014 with LBU grant proposals now winning funding from highly competitive sources such as RCUK and UK Central Government. During this REF period we have seen an almost 10-fold increase in income from RCUK sources and a 50% increase in funding from UK Central Government. Examples of significant research awards to staff include; **Surr** was part of the EPIC Trial consortium (£2.1m from 2015-17, £520K to LBU), and has secured NIHR funding for CanDem, a cancer and dementia comorbidity study (£254K from 2018-19), and support from the Alzheimer’s Society for Patient-Centred Care in hospitals (£207K from 2020-21). **South** secured funding from the ESRC for the “What Works Centre for Wellbeing” (£208K from 2018-19) and was part of the University of Liverpool led consortium that was successful in the ESRC “What Works Wellbeing” bid [£1M ,2015-18], and funding from the People’s Health Trust (£239K from 2017-19) and PHE (£266K from 2016-19) for community engagement in health projects. **Bagnall** secured funding on a variety of health inequality projects from Macmillan Cancer Support (£117K from 2018-19) and People’s Health Trust and Centre for Ageing Better (£124K from 2018-19). **White** secured funding from Gilead Sciences international for work into cystic fibrosis (£193K from 2015-17). **Brooks** secured funding from the Castang Foundation for research into child mental health (£103K from 2017-19). Most recently **Ells** has secured funding from NIHR [£1.5M from 2020-2023] to evaluate the NHS Low Calorie Diet initiative.

During the entire REF cycle the unit has received an excellent level of sustained financial support from the University to grow and develop high quality health research. This support evolved and increased in value as the University transitioned through a re-structuring period. In the early phase of this REF cycle researchers in the unit benefitted from a variety of QR-funded and Faculty-funded schemes, which were designed to support excellent research and career development of academic staff. From 2015-17 LBU offered QR funded schemes reflecting research experience and career stage, these were:

**Unit-level environment template (REF5b)**

- a) Early Career awards. Up to £5K for research project development.
- b) Mid-Career awards. Up to £15K for research project development.
- c) Research Cluster awards. Up to £30K to develop research clusters within LBU.

These awards were highly competitive and unit researchers were awarded over £100K from these schemes to support their research [**Postis** £15K mid-career and £30K cluster, **Apekey** £5K early-career and 30K cluster, **Maynard** £25K cluster]. In addition, there existed a Faculty sabbatical scheme, which effectively bought out teaching time for any staff awarded. Between 2015-18, **Gomez-Escalada**, **Galbraith**, **de Marcos Lousa**, **Milton**, **Apekey**, **Maynard**, **George**, **Paterson** and **Sabir**, all benefited from this scheme.

Following the move from Faculty to Schools as cost centres (2017), LBU developed a new funding model for the distribution of QR funding. While each UoA would receive an appropriate allocation based on performance in REF2014, 70% of QR was to be retained centrally and would be allocated strategically following a competitive process whereby DoRs submitted a funding proposal. Significantly, this strategically awarded QR was to be linked with longer-term research goals that aligned with the UK Industrial Strategy. Through this process the unit was awarded £1.29M over 3 years (£430K pa, 2019-21) to develop and support biomedical science and health research. This research-only budget is administered by the DoR. Part of this funding pays 50% of the salary of Professor **Ells**, which SCA has committed to take on fully in 2021, and importantly pays for 100% of a research Technician to manage and coordinate the new biomedical science research laboratories, again with a commitment from SCA to fully support this position from 2021. This coordinated research recruitment strategy between the Dean of SCA and DoR maximises the capability and sustainability of the unit's research activity.

Complementing institutional resources supporting impact, the DoR utilises QR funding to provide targeted and *ad hoc* support for activities relating to impact. For example, financial support was provided for all researchers involved impact case study preparation to attend training workshops hosted by *Fast Track Impact*. Additionally, administrative support was provided for collection and collation of evidence of impact for all our developing case studies as well as funding for external review.

**Infrastructure and facilities:** The establishment of the DoR role facilitated the expert objective assessment of available LBU infrastructure and how this relates to our ambitious research goals in health research, and importantly where resources should be invested for long-term development and sustainability. LBU is committed to supporting the growth of STEM research within the institution. As a consequence of this strategy, UoA3 has benefited greatly from research resource allocation, both from School-associated and central University-related funding sources. In total over £1.5M has been invested in Biomedical Science research at LBU since 2016. In addition to the QR investment in people described above, the following has been allocated and invested to improve research infrastructure:

- i) Repurposing of office space to construct a new Class 1 Microbiology/Biochemistry research laboratory for the CBSR, which can comfortably accommodate 12-16 researchers. Approximately £750K was invested directly into the laboratory construction, using institutional infrastructure funding and an internal competitive HEIF allocation.
- ii) A crucial part of the laboratory investment also included a reconfiguration of an existing cell biology research laboratory to maximise space and usage in both laboratories. Consequently, our biomedical science wet-lab space can now comfortably accommodate the recent increase in PhD numbers, and our plans for future growth.

**Unit-level environment template (REF5b)**

- iii) Through capital investment, from institutional and School-level sources, over £500K has been invested in purchasing state-of-the-art biochemistry and cell biology equipment for housing in both the new and reconfigured laboratories. High-specification versions of AKTA protein purifiers, EVOS Cell imaging systems, BD FACS, suite of CLARIOstar plate readers and a Seahorse metabolic analyser. As an example of our shrewd investment in cutting-edge equipment, we have colleagues from neighbouring Post-92 and Russell Group institutions across Yorkshire, coming to our facilities to utilise our equipment such as the NanoSightNS300 particle analyser, both for access and expertise of use. Additionally, since 2019 and coupled with increased wet-laboratory research activity, QR-funding in excess of £40Kpa has been allocated for biomedical research consumables.

This is a significant investment of resources for LBU and demonstrates the institution's commitment to driving forward our research agenda in biomedical sciences. This investment has allowed a step change in laboratory-based public health sciences at LBU and has added value in terms of both the quantity, quality, and overall capability of the CBSR.

The biomedical science research laboratories are located on the 9<sup>th</sup> floor of the adjoining Portland and Calverly buildings on our City campus. As part of LBUs campus masterplan, the University has invested over £138M in two new buildings; for Sport, and Performing Arts, both to be fully completed by end of 2021. Once completed these buildings will allow relocation of a number of Schools and services within them, which will free up space in other areas. It is the long-term plan of the unit to further expand our wet-lab facilities on the 9<sup>th</sup> floor of Calverly building and develop another Class 2 research laboratory. The committed and sustained investment in health-research at LBU, coupled with a clear research strategy for the unit moving forward, demonstrates a step-change in research activity and capability at LBU compared to REF2014, which has in turn translated into significant improvements in the quality and impact of our health and STEM research.

|  |
|--|
| <b>4. Collaboration and contribution to the research base, economy and society</b> |
|--|

Since 2014, the strategic recruitment of senior research active staff coupled with the enhanced internal financial support for established LBU research active academics, has allowed a step-change in the level of collaboration and contribution from our academics to the sectorial research base, economy and society. Importantly, this step-change is not solely associated with senior staff but is spread across mid-career and early-career academics within the unit. The DoR and the Deans fully appreciate the importance of collaboration and contribution to the discipline and proactively encourages such engagement, through mentoring and financial support (through QR and School-funded CPD). The following key representative examples are not exhaustive for the unit but cover the breadth of activity and involvement from across the whole unit, not just senior researchers.

**Engaging with key stakeholders in research:** Staff are engaged in a wide variety of research collaborations with national and international universities, national SMEs, national government agencies, local government agencies and charities. Of particular note are the links between **South** and **Ells** with PHE. **South** has a long-standing secondment to PHE as a National Advisor- Communities [since 2014], which has helped shape the national guidance around community engagement with public health, within the Health Improvement Directorate of PHE. In 2019 a Collaborative Academic & Research Activity Agreement (CARAA) between PHE and LBU was signed. **Ells** is a Specialist Academic Advisor to PHE on strategies for combatting obesity, particularly in the area of health inequalities, and is helping to shape the next national strategic response to dealing with this epidemic. LBU has a MOU with Leeds Teaching Hospitals Trust [LTHT] and close links with Leeds General

**Unit-level environment template (REF5b)**

Infirmery [LGI], and LBU UoA3 staff are initiating and developing individual collaborations with members of these organisations. For example, **Lang**, **Roberts** and **Brooks** co-supervise PhD students with staff based at LGI and St James's hospital. **Sharp** sits on the Operations Board of the LAHP and has recently negotiated a jointly-funded embedded researcher in health inequalities to be located within the CHPR at LBU. Many of our public health researchers have long established links with Leeds City Council, Wakefield Council and local charities, and contribute time to research projects and evaluation studies on a regular basis to support these agencies. All members of the **CDR**, **CHPR** and **CDR [16 staff]** and **6** members of the **CBSR** have current ongoing research projects with at least one of these local stakeholders (22 out of 30 staff in the submission). **South** and **Bagnall** were commissioned by the World Health Organisation [WHO] to produce a peer-reviewed Health Education Network [HEN] report into best practice in community engagement with health and **Ells** was asked to provide evidence to the WHO regarding approaches to combatting childhood obesity.

Researchers across the unit have established collaboration with a broad range of national and international HEIs. Our major funding successes in leading collaborative projects [**Surr**, **Ells**, **South**], include collaborators from Universities such as Leeds, Liverpool, Manchester, Exeter, Newcastle and Birmingham, in addition to other national collaborators. International collaborations total more than 50, with some examples demonstrating geographical breadth include, China [CAS Institute of Biophysics, Institute of Apiceutical Research, **Jones** and **Gomez-Escalada**]; Italy [University of Perugia, University of Cagliari, **de Marcos Lousa**, **Postis**]; Ghana, Nigeria and Ivory Coast [University of Ghana-Accra, Federal Polytechnic of Nigeria, University of Abidjan, **Maynard**, **Apekey**, **de Marcos Lousa**, **Postis**]; Malaysia [Monash University- Kuala Lumpur, **Woodall**, **Griffiths**, **Smith**]; Australia [University of Newcastle, **Ells**]; USA [UNC-Charlotte, UNC-Greenboro, **Jones** and **Ells**]; Libya [University of Benghazi, **Tashani**]; Norway [University of Bergen, **Johnson**]; Brazil [University of Sao Paulo, **Jones** and **Johnson**].

**Public engagement & co-production:** Our health researchers at LBU pride themselves with being at the forefront of public engagement and co-production in research. Public Patient Involvement [PPI] is at the heart of our major public health projects across the CDR, CAOR and CHPR. **Surr**, **Ells** and **South**, are leaders in their respective fields in bringing PPI to the forefront of project planning and delivery, and along with LBU research centre colleagues work on a variety of co-production research projects, with some representative examples being; **Surr** led the "Dementia Care Mapping- EPIC Trial", which had major PPI, has presented at a research conference with an "EPIC Trial" PPI member, and has co-authored a review on guidelines for PPI with a PPI group member living with dementia. **Ells** is leading the evaluation of the NHS LCD initiative that is underpinned by an embedded patient group that developed the original research application, helped design the patient-facing materials, and is helping LBU to develop a regional PPI centre for developing best practice and ensuring PPI is integrated appropriately into all our public health projects. Additionally, recent funding from NIHR CRN has allowed the development of the Yorkshire and Humber Obesity Research Alliance [YORA] that is specifically designed to bring together policy, practice, public and academia in working together to tackle obesity. **South** has been a long-time advocate for the importance and benefits of public engagement and co-production approaches in public health. In addition to the significant impact and public engagement demonstrated in the Community impact case study, the LBU CommUNITY initiative has run throughout the REF period. This is defined as a community-campus partnership for health and has been a conduit for engaging the public and community in a variety of activities including research and enterprise. **Maynard** and **Apekey** have embedded co-production/public engagement in a number of ongoing research projects defining the nutritional content of African and Caribbean foods. A specific example being the

**Unit-level environment template (REF5b)**

Food Diabetes and Ethnicity [FOODEY] study, which is currently ongoing, and aimed at providing nutritional data to allow the ethnic community to make more informed decisions in relation to nutrition and health. Staff across the unit are regularly involved in a variety of public engagement and dissemination events, either on campus or within the community. Representative examples being **Johnson's** regular annual lecture on aspects of pain research delivered as part of "Café Scientifique" event held at Leeds City Museum and "is Pain Real?" delivered as part of the Leeds International Festival 2019.

**Visiting positions and Fellowships:** **Ells** is an Adjunct Professor at University of North Carolina, Greenboro, USA; **Jones** is a Visiting Professor, College of the Environment, Liaoning University, Shenyang, China and recipient of PIFI CAS Visiting Fellowship 2015 [Institute of Biophysics, Beijing]; **Postis** is a visiting Associate Professor at the University of Leeds, **de Marcos Lousa**, **Galbraith** and **Sabir** are all Visiting Scientists at the University of Leeds, **Smith** is Honorary Senior Lecturer at University of Bradford. **Kelley** is a visiting Research Fellow at the University of Leeds and recipient of NIHR Clinical Trials Fellowship 2015/6.

**Journal editorial board membership and roles:** Microbial Cell, PLOS One, Guest Editor- PLOS Genetics (**Jones**); Acupuncture in Medicine, Analgesia and Resuscitation: Current Research, Pain Management, Medicina, and Guest Editor- Medicina Special Issue on Chronic Pain (**Johnson**); Health Education- Editor in Chief (**Woodall**); Molecular Membrane Biology- Editor in Chief (**Postis**); PLOS One, International Journal of Behavioural Nutrition and Physical Activity (**Ells**); Molecular Membrane Biology- Associate Editor, Frontiers in Cell and Developmental Biology- membrane trafficking section (**de Marcos Lousa**); Systematic Reviews- Associate Editor, Journal of Psychology (**Bagnall**); Cochrane Dementia and Cognitive Improvement, Journal of Dementia Care (**Surr**), Libyan Journal of Medicine (**Tashani**), Journal of Hospital Infection (**Lang**), Frontiers in Microbiology (Virology) (**Galbraith**), BMC Public Health, Ethnicity & Health Journal (**Maynard**), BMC Health Services Research- Associate Editor (**Griffiths**).

**Participation in the peer-review process:** **Jones** has reviewed ERC Starter and Consolidator awards, BBSRC (Project), MRC (Programme, Project and Senior Non-Clinical Fellowships), FCT (Portugal), ANR/ARSLA/FRM (France) and Israeli Science Foundation. **de Marcos Lousa** has reviewed EU ITNs and for the BBSRC. **Ells** has reviewed application to NIHR, MRC, CRUK and FWF (Austria). **Johnson** receives regular requests from variety of sources including Arthritis UK, Pain Foundation, Axa research fund. **Milton** has reviewed for the ARUK and Alzheimer's Society. **Kelley** has reviewed for NIHR Health & Social Care panel, the Dunhill Medical Trust and Carnegie Trust (PD Fellowships). **Lang** has reviewed for ESRC, BBSRC, BHF and Tenovus Scotland. **Smith** has reviewed for NIHR. **Maynard** has reviewed for ESRC, MRC, Royal Society of Tropical Medicine and Hygiene (RSTMH), Guys & St Thomas' Charity, Academy of Medical Sciences, and Irish Health Research Board. **Bagnall** reviewed for ESRC, MRC, Nuffield Foundation and NIHR. **Sharp** has reviewed for EPSRC and Polish Government. **Galbraith** has reviewed for MRC and the British Council. **Griffiths** has reviewed for NIHR, RCF and H&CR (Wales). **Woodall** has reviewed for NIHR, Cochrane Public Health Group, The French National Cancer Institute (INCa), Alzheimer's Society and Canada's PSI (Physician's Services Incorporated). **White** has reviewed for the Health Research Council of New Zealand. **Postis** has reviewed for MRC and ANR (France). **Surr** has reviewed for NIHR HS&DR, NIHR RfPB, NIHR PGfAR, NIHR HTA, Abbeyfield Research Foundation, HSC Wales, ISRF Mid-career fellowships, ESRC, Dementia Centre Research Australia, NWCRF. **Brooks** has reviewed for NIHR and RCOT Research Foundation. **Paterson** has reviewed for BBSRC and MRC.

**Unit-level environment template (REF5b)**

**Board memberships and advisory bodies:** **Burden** is Chair RCN Education Forum and a member RCN Governance Forum; **Jones** is a board member of Leeds Clinical Senate, Leeds Centre for Personalised Medicine and Health; **Johnson** is a member of the GSK Global Faculty of Pain, and is an expert consultant for GalxoSmithKline plc - UK, TENS Care Ltd - UK, iPulse Medical Ltd. (Livia)/LifeCare Ltd. – USA, Eurocept Pharmaceuticals, Netherlands. **Brooks** is Member of the British Academy of Childhood Disability Strategic Research Group and Research Lead for the National Executive Committee of the Royal College of Occupational Therapists Specialist Section for Children, Young People and Families. **Maynard** was a member of the Community Education Advisory board for Diabetes UK, and was appointed to an expert group to evaluate the European Commission evidence review on nutrition and physical activity. **Surr** is a board member of Leeds Clinical Senate and part of the Health Education England Dementia Workforce Advisory Group. **Ells** has an honorary appointment as a specialist academic advisor to PHE, has numerous expert advisory role appointments including to the NHS Choices losing weight, the National Child Measurement Programme, Public Health Advisory committee for NICE guidance NG7, PHE digital weight management group, and has advised North Yorkshire Council, South Tees NHS and the North East region, on weight control measures to tackle obesity. **South** was appointed to PHE's Health Inequalities Board in 2018 and was a member of expert group appointed by WHO to enhance Health2020 monitoring and reporting. Additionally, a member of NICE Public Health Advisory Committee on Community Engagement and NICE Quality Standards Committee. She holds an honorary appointment as an academic adviser to PHE. **Smith** sits on advisory panels for the Higher Education Dementia Network and Leeds ACTS. **De Marcos Lousa** is a board member and secretary of the British Society of Cell Biology. **Kelley** is a member of the Dementia Strategy Group of Leeds Teaching Hospitals Trust and sits on the NIHR Mental Health Incubator advisory group. **Sharp** is a member on boards for Leeds Academic Health Partnership, Leeds Clinical Senate (Executive Group) and the Council of Deans of Health. **Burden** is a member of the RCN Task and Finish Group. **White** was a Member of the European Cystic Fibrosis Scientific Committee (2013-2016) and is the British Dietetic Association's Cystic Fibrosis Specialist Group Research lead.

**Contributions to funding organisations:** **Jones** is a member of the UKRI Future Leaders Review College and is a Marie Skłodowska Curie Postdoctoral Fellowships LIF Panel member (since 2010). **Surr** is an Alzheimer's Society PhD review panel member sits on the Alzheimer's Society Care and Services Research Board, Research for Patient Benefit Yorkshire and the North East funding panel, and is engaged with NIHR activities such as Chair of Steering Committee for NIHR funded study (14/197/65) and steering group member for NIHR DEMCOM project and also is Chair of the steering committee for Physiotherapy Research Foundation PATCH project; **Johnson** is Deputy Chair of the Steering Committee for the NIHR-funded RCT – PACC2 Trial. **Lang** served as a Scientific Committee Member for Tenovus Scotland (2013-17). **Kelley** is a member of the NIHR Yorkshire and Humber Research for Patient Benefit funding panel. **Ells** is a member of the UKRI Peer Review College. **Bagnall** is a Systematic Reviewer trainer for Cochrane. **de Marcos Lousa** was a member of Marie Skłodowska Curie Postdoctoral Fellowships LIF Panel (2020).

**External examination of PhDs:** Staff within the unit regularly examine PhD theses from HEIs across the whole of the UK and Ireland, more than forty in the REF period. International PhD examinations by staff include, **Jones**- University of Stockholm (2015), **Johnson**- University of Otago (2016), **White**- La Trobe University (2020).

**Selected invited conference keynotes and lectures:** **Jones** was an invited speaker at CSSI "Heat Shock Proteins" meeting in Washington DC (2014) and the EMBO "Biology of Molecular Chaperones" meeting in Crete, (2015). **Postis** was an invited speaker at the 2<sup>nd</sup>

**Unit-level environment template (REF5b)**

Integrative Structural Biology Conference in Paris (2017) and the International SMALP meeting in Utrecht (2019). **George** was an invited speaker at the International meeting on “Superbugs and Superdrugs” held in London (2018). **Ells** was an invited speaker at the “European Congress on Obesity” in Glasgow (2018) and in Vienna (2019). **Johnson** was invited speaker at the 11<sup>th</sup> Congress of the European Pain Federation in Copenhagen (2017) and 13<sup>th</sup> held in Valencia (2019). **Surr** was an invited speaker at the “Dementia Reimagined” symposium in Calgary (2018), “Person-centred care for elderly people with an intellectual disability” symposium in Leeuwarden (2019), “Tsukuba Scientific English” Conference in Tsukuba (2019) and the Virtual Congress of the Spanish Society of Geriatrics and Gerontology (2020). **South** was an invited speaker at the “Health Inequalities” international conference (2019) in Wageningen, and a keynote speaker at the “Community Building Network” conference (2020) in Milan.