

Institution: University of Chester		
Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing and Pharmacy		
a. Overview		
<p>This Unit submission consists of Allied Health Professions (AHP) and Nursing. The former is hosted by the Faculty of Applied Sciences (FAS) and the latter by the Faculty of Health and Social Care (FHSC). As disciplines within separate organisational units we will discuss both distinct and shared features of the research environment. The Unit comprises four research groups:</p> <p>1) Women's Health; 2) Mental Health and Learning Disability; 3) Health Education and Practice Development; and 4) Clinical Science. The Unit operates over five university campuses and our collaborative research is supported by continuous access to high quality information technology. The Unit staff are engaged with a range of research, evaluation, consultancy and development work, aiming to provide high quality outputs impacting on the work of policy makers, managers and practitioners. Through our close relationship with local and national NHS trusts we aim to bring research expertise to real health challenges and through quality research have a direct and rapid impact on evidence-based practice.</p>		
b. Research strategy		
<u>Achievement of strategic aims during the assessment period</u>		
<p>The Unit's overall aim has been the growth of high-quality research and consequent outputs with robust impact. The Unit has strategically developed a thriving multi-disciplinary research and scholarly culture developing areas of interest highly relevant to applied health. The aims of this plan were to: operate and develop a transparent, facilitative structure for research; increase the numbers of research active staff; increase research income and increase research student activity. This growth strategy has enabled the work of a talented and expert diverse team who have been committed to extending the benefit and reach of research across all their activities. The first aim has been achieved by resourcing the Research Office, by operating a committee structure whereby research efforts are open to contribution and scrutiny and by managing the whole staff team according to a workload model that includes specified resource for research. The second aim has succeeded via a robust staffing strategy, including the appointment of Visiting Professors who are strengthening our links with a wide variety of health services and discipline-specific interests. The Unit can demonstrate its development from 2008 to 2013 with a number of key markers of research endeavour and these are tabulated below:</p>		
Evidence	2008	2013
Number of Staff	17	24
Research Publications: submitted to REF	61	91
Total	95	189
Research Funding	£1,500,000	£2,741,665*
Doctoral Students: Registered	29	64
Doctoral Students: Successful Completion	18	20.35

* includes expenditure to date from EDRF funding on the new Food Innovation Centre which is ineligible for inclusion in REF4

1) The *Women's Health* group is led by Professor Steen-Greaves and includes three research strands: the development of Midwifery practice, exploring domestic violence, stigma and teenage pregnancy. The rationale for this group is to enhance the health care experience of vulnerable women through applied research leading to practice development, and through efforts to better understand social processes which impact their health status. Steen-Greaves has used her research-based work to write for pregnant women and their partners and as a consultant with a commercial organisation, as well as producing a research methods text for midwives at undergraduate and postgraduate levels. Keeling's work has added to the international body of knowledge concerning domestic violence, specifically in relation to the disclosure of domestic violence in different stages of pregnancy and how women's experiences of domestic violence can

inform improved professional intervention. Mason-Whitehead has continued to study the ramifications of stigma in teenage pregnancy and is now leading a funded research study on teenage abortion and stigma

2) The *Mental Health and Learning Disability* group is led by Professor Lovell, who is one of only three Learning Disability Professors nationally. This is an established group founded by the late Professor Tom Mason: evidence of his influence is found in five papers where he was joint author. The group has several themes unifying this work: service user involvement; forensic learning disability issues; cognitive behavioural therapy; violence and self-injury; physical health care and learning disability/mental health. The rationale for this approach was to develop a culture of research designed to influence developments in clinical practice at both national and international levels. Lovell's work in relation to self-injury in the context of learning disability challenges conventional orthodoxy in its psychoanalytical and relational focus. Lovell & Skellern's collaborative work on clinical violence and the issue of de-escalation involves a combination of research approaches which is influencing clinical practice in a wide range of settings and professional groups through their scenario-based DVD (2013). Further studies include: exploring the needs of professionals in supporting women with learning disabilities who may have experienced sexual abuse (in collaboration with a former student); a poster presented at the Cheshire & Wirral Partnership NHS Foundation Trust [CWP] research event around the development of an effective strategy to enhance the clinical practice experience for mentors and student nurses (with a practitioner and practice facilitator, and funded by the RCN and a local NHS Trust); Sharma has been instrumental in the development and use of GMHAT (General Mental Health Assessment Tool), assisting health professionals to make a speedy and comprehensive mental health assessment to identify mental illness. It is now a global tool having a unique value in developing countries. Sharma, with colleagues from the Unit and wider University, established strong collaborations in the US, South America and India.

3) The *Health Education and Practice Development* Group is led by Professor Mason-Whitehead and Professor Cooper. Its role is to embrace research with diverse substantive topics and sharing a common aim that impacts on practice improvement for health benefit. Pedagogical research has developed considerably since 2008 and this is borne out in its research and extensive publications, conference presentations, papers, chapters and textbooks. The Group has contributed to the patient and staff experience in a number of notable ways, examples include the work by McIntosh-Scott and Gidman, the development of a patient forum to enhance patient involvement from a formal research grant, and pedagogical grants to enhance student support in academic and practice settings and support staff submitting knowledge transfer and pedagogical research bids. Research work in this group has benefited greatly from collaborating with, and contributing to, the Forum of Carers and Users of Services (FOCUS). They have provided expert advice and assistance with speedy access to a broad base of service user organisations. This is a positive and reciprocal relationship. For example, they have been awarded a research grant from the Strategic Health Authority to explore how service users and carers can contribute to the assessment of nursing students during practice placements. The Unit mentor the researchers from FOCUS during this study, this being a condition of the grant award demonstrating recognition of our research expertise. Cooper has been influencing care for young diabetic patients through the development of the online Adolescent Diabetes Needs Assessment Tool (ADNAT).

4. The *Clinical Science* (CS) group is led by Professor Williams and uses biomedical and physiological tools for the assessment of health and disease. Mushtaq and Williams have demonstrated the consequences of moderate B vitamin deficiencies. Williams has shown the potential for utilising vitamin B₁₂ and novel derivatives in the treatment of dementia, including Alzheimer's Disease, resulting in production of a novel vitamin-based supplement by a local company – and now licensed by PamLab Llc in the U.S whilst Mushtaq has developed PPO as a novel biomarker for riboflavin status and demonstrated that although many people may be moderately deficient, supplementation improves hematologic status. Stress protein biology has been a strength of the work of Ireland and Williams for several years and they have shown how an understanding of processes regulating stress protein translocation can be utilised in novel therapeutic approaches. This work has also resulted in identifying the chemokine receptor CCR9 and CCL25 on monocytes in rheumatoid arthritic patients. Hughes has focused on identifying clinically useful markers of inflammation through close work with surgical units. The study is

currently being extended to the identification of interactions between stress proteins and immune responses and the receptor complexes involved in rheumatoid arthritis, type 2 diabetes and colorectal cancer. A variety of food products have been studied by members of the group either for the purpose of authentication or assessment of quality (Bonwick, Ireland and Williams) and some innovative multidisciplinary approaches have been developed for the assessment of public health issues particularly related to obesity and the effectiveness of direct interventions in the general population or within different ethnic groups (Ellahi and Kennedy). Kennedy's work on Health Advocacy in Action has directly influenced local planning legislation (WCBC, 2012). The use of exercise programmes forms a focus for Buckley and Fallows. Contrary to the image of couch potato teenagers becoming obese while they play computer games, Buckley and Fallows have shown that certain platforms can have positive effects, as energy expenditure increases while using the Kinect active video game. There are potential implications here for patients lacking mobility and these are currently being explored. The University runs a Cardiac Rehabilitation programme with the local Hospital Trust (Countess of Chester Hospital) and Buckley and Fallows have been evaluating the effectiveness of this programme and the use of non-invasive measures of exercise intensity has informed practice directly. The MSc Cardiac Rehabilitation programme attracts health professionals from across the globe ensuring that this evidence-based approach directly influences national and international healthcare.

A feature of the Unit's work is the proximity to real health challenges through the development of Practice Development and Research Partnerships (PDRPs). PDRPs are of necessity multidisciplinary and promote collaborative research projects between the University and health practice colleagues facilitating a close knowledge transfer relationship between practice and the academic institution. PDRP management groups meet once a month, and have membership including staff from the University and the relevant Hospital Boards. Within the period of assessment PDRPs have, until more recently, largely concentrated on developing their infrastructure and on practice development efforts; these endeavours are continuing in a context of health care organisation change, where research activity is becoming more embedded and all such activity is directed to include service user involvement. For example, a new Renal PDRP has commenced collecting and analysing data regarding service users' perspectives on the needs for service improvement. Multidisciplinary research is encouraged through Special Interest Groups (SIGs). The SIGs' ambitions are to capture research interests of staff from across departmental boundaries on significant areas of research and knowledge transfer. An example of such a group, is the Dementia SIG, founded in 2010 built on our expertise across the Unit in dementia research. Its success has progressed to a new Dementia research group, initiated and spearheaded by the appointment of a Professor of Ageing and Mental Health, Professor Paul Kingston, demonstrating our responsiveness to international priorities and national initiatives.

There are several on-going research projects which have not yet produced visible outcomes but will do so in the medium term – a small number of these are highlighted below. Steen-Greaves is the co-investigator on two recent and successful bids. First *Maternity Assist*, an innovative midwifery-led digital information and communication system to enhance maternity care and promote health (£49,851 from Liverpool PCT grants to undertake preparatory work prior to applying for a NIHR bid). Secondly, *Mind Resilience Building Model Evaluation*, an impact evaluation of the Mind resilience programme to be undertaken by Dr Mark Robinson with Professor Steve Robertson at the Centre for Men's Health at Leeds Metropolitan University and Steen-Greaves (£30,000).

The Health Education and Practice Development group has a grant to study *Nurse educators' perceptions and experiences of simulation technology as a tool to enhance pre-registration nurse education* and Mason-Whitehead has set up two funded research projects, *Developing a stigma measure for teenage abortion*, and *Children with cerebral palsy on the Wirral: Assessing prevalence and services*. Major change over the assessment period has involved longer term plans and we discuss these below in section e regarding collaborative work. In summary, we have robust mechanisms and practices for promoting research, and sustaining and developing an active and vital research culture within this UoA.

Williams in collaboration with University of Liverpool and staff at the Countess of Chester Hospital are currently funded (£40,000) by the Bowel Disease Research Foundation for a study *Targeting*

heat shock protein 27 in colorectal cancer. This work includes pre-clinical assessments of novel therapeutic products from Novartis, Syntapharma and Oncogenix.

c. People including:

i. Staffing strategy and staff development

Our staffing and staff development strategies operate at University and Faculty levels. Commitment to the development of all staff of the University has been recognised externally by the recent award to the University of the HR Excellence in Research Award demonstrating a commitment to implementation of the Concordat to Support the Career Development of Researchers. The University has established (through the Research Committee) a forum for early-career staff to enable networking across subject and discipline boundaries and to help identify and address common problems and allow issues to be raised at policy-making level.

The University is dedicated to delivering personalised and sustained professional development: key areas include funding provided for fees, study leave and opportunities for continuous professional development including attendance at research method courses, study days, research seminars and conferences. Academic staff of the University are supported through a number of initiatives: significantly, masters' degrees, doctoral studies and an accredited programme leading to Fellowship of the Higher Education Academy. A particular feature of the Chester programme is that the compulsory core modules provide developmental support, assisting and encouraging newly appointed staff to understand the demands and opportunities of research supervision, encouraging them to study a further optional module that develops skills in supervision to doctoral level.

The University of Chester supports activities promoting equality and diversity. There is a long-established annual University Diversity Festival which is open to all staff, students and members of the public. The University has a Disabled Staff Group that has been active since 2007 and provides a safe and supportive environment in which to discuss issues relating to disability. The Human Resources Department monitor equality issues regularly as part of the recruitment process for staff and funded research students, and the University is preparing an application for an Athena Swan award. The University has also been selected to participate in the Equality Challenge Unit's Gender Equality Charter Mark pilot project.

Within this Unit part-time staff are encouraged to negotiate flexible contracts and we are supportive of research related secondments. For example, Cooper is seconded two days per week to the Research and Development Unit at Alder Hey Children's NHS Foundation Trust.

The University's Annual Staff Conference is an all-day event held each year. Research is featured within the conference through showcasing successful projects, opportunities to develop impact, advice on good practice in grant applications, research governance and collaborative initiatives.

The probationary and induction programmes are interlinked ensuring that new members of staff are introduced to a wide range of facilities and policies. These include access to colleagues from the Research and Knowledge Transfer Office who provide assistance in grant applications and R&D contracts. Colleagues in the Graduate School help advertise research projects, interview and admit potential research students. The research needs of the Unit are taken into consideration when we employ new staff. However, given the objective to increase the numbers of research active staff within the Unit we have followed a continuing programme of 'growing our own' staff, alongside the employment of more Professors. Mason-Whitehead has an overarching brief to develop research active staff. One of the roles of the Professor-leads in each Group is to mentor departmental staff in their research activities, whether experienced researchers or new staff. New staff are encouraged to join SIGs and PDRPs, and suggest new ones. There are joint writing for publication schemes and programmes facilitating staff transition into doctoral studies. A system of annual Performance and Development Reviews includes reference to organisational expectations regarding research activity and deploys resources for individuals to see their plans through within the structure of a research group. The structural significance of the SIGs is to provide a first step towards research activity for members of staff at the beginning of their research career and to empower staff to engage in research activity and move towards publication. For example, the *Mind-Body* SIG is conducting a university funded study exploring perceptions of person-centred

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care amongst service users, carers and teaching staff and has involved four members of staff as co-researchers. We view SIGs as organic developments responding to changing interests and agendas.

Researchers are supported by the Research Office lead and their Principal Investigator colleagues. They are part of a Research Office Management Group which meets regularly and is led by the Associate Dean for Business and Enterprise. The development of researchers is addressed through the University-wide Performance and Development Review system.

Evidence of the Unit's inclusive relationship with researchers is clearly demonstrated, and their continuous professional development is supported through PhD registration and collaborative publishing initiatives. Researchers and Research Assistants are also invited to contribute to the fortnightly seminar series and to the Faculty Ethics Committees. They have the opportunity to present their work at conferences and staff days and to teach within both of the Faculties.

ii. Research students

Since RAE2008 there has been a significant expansion in the scale and scope of research degree provision, with PGR students registered both full-time and part-time. For part time students, and in full-time employment, the provision of flexible training and supervision is of great importance and well catered for at the University. Within Nursing there are a growing number of international students (reflecting the University's increasing international profile for research) and our first Professional Doctorate students will reach their thesis stage in 2014/15. As PGR student numbers have grown we have developed a mentorship system designed to grow more high quality research supervisors. The University meets the QAA Quality Code requirements.

Training and support for PGR students is a responsibility shared at Chester, between the Graduate School (with responsibility for providing generic training and support) and the subject department which provides supervision and specialist training and support. PGR students are offered individual training sessions by the Graduate School, supported by a Moodle site providing on-line access to training materials written and contributed by academic staff from across all subjects and faculties. Students experience both a central University induction, and a local induction within the department, so that they have a full understanding of the regulations and services provided by central support departments as well as of the local support staff and facilities in the building where they are studying. All students undertake a skills audit and they attend taught sessions from the postgraduate curriculum, seminars and training sessions. Students attend and present their work at the relevant Faculty annual PGR conference and research seminar series, and PhD student directed seminar group. The University recognises the value of conference participation for all PGR students and has established a fund to provide a contribution to conference attendance. Each year applications are invited and all successful applicants are provided with financial support.

Students who will be involved in teaching (with the exception of those who are already academic staff), are expected to undertake specific training to prepare them for this activity, and may, if they wish, undertake modules leading to Associate Fellowship of the Higher Education Academy, which provides a sound basis for future applications for academic posts.

Each student is supported by a team of at least two approved supervisors, one of whom is designated Director of Studies, and who has supervised at least one student to successful completion of the award. Supervision meetings take place at least once per month with outcomes and targets being recorded. Following a probationary period of 6 months, student progress is reviewed formally every year and considered at the Annual Progress Board meeting. Students must submit a report, give a seminar and attend an interview before their upgrade from MPhil to PhD can be confirmed. There is a similar rigorous process to consider applications to transfer to 'writing up' status. Each Faculty has at least one Faculty PG tutor who is available to see PGR students by appointment and to resolve any issues or questions they may have. Faculty tutors represent their Faculty and its students at the regular Graduate School meetings and also represent the Graduate School as appropriate in their Faculty.

Students have access to fully equipped working space both within their Faculty and in the wider university including the Postgraduate Research Student Centre, opened in October 2013. All PGR students have swipe card access to a fully equipped study space. Part-time students often prefer

to work at home or their place of employment and benefit from 24-hour electronic library access.

The 'grow our own' philosophy embraces undergraduate students too. 'New Scholar' is an innovative journal facilitating the first publication efforts of students, following on from 'Origins' which has now evolved into the national journal 'BioHorizons', aiming to further develop their research aspirations. The growth of research student activity will be taken forward through three activities. First, by continuing to grow and publicise our reputation for postgraduate research by giving students a high quality experience. Secondly by growing full-time research studentships as integral to research grants, including three in the Centre for Psychological Therapies in Primary Care (see below) and the Professor Tom Mason Award. Third, by bringing through successful taught Masters students into research programmes, particularly from our growing cohorts of dentists and medics.

d. Income, infrastructure and facilities

Research Management

The research activity and strategy of the Unit are directed by the Dean (FAS) and Executive Dean (FHSC), respectively. Research engagement is led by the Professorial Group and Strategic intent formalised by the Faculty Research Committees, reporting centrally to the University Research and Knowledge Transfer Committee. Research income is effectively administered through the R&KT Office using transparent financial processes.

The Research Office is the central hub for research activity within the Unit. It forms the focus – and first point of contact – regarding all research endeavour and knowledge transfer within the Faculty. Contracted research projects are designed specifically to suit individual organisational needs, both short and long term. They work closely with their clients to ensure they deliver services which meet their requirements, and have experience working with a broad customer base including the NHS, local councils, the private sector and third sector organisations. Researchers within the Research Office work on specific projects with research active academic staff and provide support to early career researchers and students. They have expertise in a broad range of research approaches including: participatory action research, cross cultural research, case studies and surveys. The Research Office can support staff with ethics applications, the sourcing of tender opportunities and the bid writing process. Tender opportunities are scrutinised at a weekly meeting led by an Associate Dean. The University has invested resources in systematic searching for relevant potential research tenders which are then directed towards Faculty research groups. Each team member has their own desk and computer with standard and research appropriate IT resources (for example, SPSS, NVIVO Qualitative Analysis software and PASW statistical analysis software).

All Ethics Committees work according to University and regulatory body guidance. This includes the policy on sponsorship, the Research Governance Handbook and the Risk Management Policy. All research undertaken in the Unit is subject to ethical review. Its committee meets regularly to review research proposals and is chaired by Dr Fallows. There are, however, exceptions to this where projects are ethically reviewed from other organisations, for example, HM Prison Service and overseas, or where it is deemed more appropriate to utilise local health services' Research Ethics Committees. A record of all research within Nursing is administered via the Committee. Its work is kept under review and reports to the Research Committee. It is Chaired by Whitehead-Mason and includes wide representation from the Unit, the wider University, service users and the NHS.

Research infrastructure and facilities

The University libraries hold over 260,000 books and a large number of journals both electronically (over 13,000) and in print (over 1,000) formats to support University research and teaching, plus the audio-visual and IT resources to help staff and students prepare learning materials and produce assignments and dissertations. The University subscribes to a significant number of eBooks and eJournals as well as databases such as Science Direct, which are accessible to students off campus via an Athens login. At the main campus library there is 24/7 access to computers, printing and quiet study space throughout the year and extended access to all collections across all sites is provided during term-time and at peak periods.

The Unit has specialist equipment for research including well-equipped laboratories for practice

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simulation, physiology, biochemistry, molecular biology, blood analysis, microbiology, tissue culture and food skills.

EU funding has been secured for the development of a Food Innovation Centre. This is situated on the main Chester Campus and to be operational by January 2014. The multi-million pound facility will offer state-of-the-art nanotechnology, rheology, chemistry and microbiology laboratories tailored to the needs of researchers and the food industry. The University has recently acquired the Thornton Science Park site which includes many specialist engineering facilities, and hosts the Health and Social Care Riverside Museum and accompanying Historical Society at the Riverside Campus.

e. Collaboration or contribution to the discipline or research base

We have referred to effective research work with colleagues outside the submitted Unit above, including NHS and academic colleagues, both national and international. In the longer-term, by developing institutional international partnerships we are laying the groundwork for future research endeavours in the FHSC. This includes work in Uganda, India, the US, Columbia and the EU. In Uganda the Kisiizi project has been under-way for a number of years. Funded by the British Council and in collaboration with the Countess of Chester Hospital NHS Foundation Trust, we have worked with the Church of Uganda Kisiizi School of Nursing to deliver a programme of continuing professional development aimed at improving nursing care. This project has led to work with the Ministry of Uganda, Busoga University where joint research opportunities in public health and mental health have been identified. Sharma led a conference there in autumn 2013 based on his research work regarding GMHAT.

Lovell's research initiatives in Germany (a comparison of secure care of people with Borderline Personality Disorder [BPD]) and Egypt (a partnership with an Egyptian academic into the family experience of caring for children with Autistic Spectrum Disorder funded by the British Academy) illustrates our innovative research methods. Postgraduate supervision constitutes a developing area of work. Skellern has expanded the service user initiative into the experiences of students with learning disabilities in gaining employment, which been replicated in Finland in collaboration with JAMK University of Applied Sciences.

In India we are collaborating with three institutions, supported through successful UK-India Education and Research Initiative bids. Sharma, Mason-Whitehead, Gidman and Bowen have been working with the Datta Meghe Institute of Medical Sciences in Nagpur and a GMHAT conference took place there in February 2013 (financially supported by the Indian Council of Medical Research and the Medical Council of India). This is a response to the WHO 'Mental Health Gap Action programme'. Sharma is conducting an evaluation of GMHAT in two Indian states. Discussions concerning joint PhD supervision and future research bids are on-going in Nagpur. At the Indian Institute of Health Management Research in Jaipur (which has University status) there has been joint work around public health, leadership and education. Whitehead-Mason is leading on a project concerning the development of qualitative research methods and planning a joint qualitative study. A global mental health conference is also being planned in Jaipur. A successful institutional capacity bid regarding healthcare education with the CSI Holdsworth Memorial Hospital in Mysore, India is a recent innovation. The initial focus of this partnership is on developing healthcare education with future aspirations for joint research work.

Shared working with the US concerns a thriving relationship with Memorial Hermann Group Hospitals in Texas. An annual nursing conference is held alternately at Houston and Chester and we are working towards shared research initiatives. Bowen and Sharma have been successful in the International Research Excellence awards (funded through the Santander Universities scheme) to travel to Bogota to establish links with the University of Columbia to provide support to develop research using GMHAT. Finally, we are involved in a Grundtvig project with partners from Belgium, France, Switzerland and Romania concerning learning disability. The initial focus is again educational but positive relationship building will lead to future research opportunities.

The Unit makes a wide and influential contribution to the discipline. Since 2008, the Unit has produced 22 books and 189 journal articles and has given 276 presentations at regional, national and international conferences, indicating wide influence on the research and discipline base.

Environment template (REF5)Patents

WO/2013/064818 (2013) Aptamers - Specific DNA sequences for the detection of food micro-organisms; WO/2012/168722 (2012) Food or feed including Moringa oil; WO/2012/168726 (2012) Low fat spread; WO/2012/168727 (2012) Triglyceride fat crystallization; WO/2012/168723 (2012) Dispersion of triglycerides; WO/2012/168724 (2012) Spread; #20080076733 (2008) Pharmaceutical compositions and therapeutic applications for the use of a novel vitamin B₁₂ derivative, N-acetyl-L-cysteinylcobalamin; #20080113900 (2008) Pharmaceutical compositions and therapeutic applications for the use of a synthetic vitamin B₁₂ derivative, glutathionylcobalamin.

Published Book Chapters with Research Focus

Dempsey-Hibbert, N.C. Hoyle, C. & Williams, J.H.H. (2012) Heat shock proteins in chronic lymphocytic leukaemia: Prognostic and therapeutic implications. P. Oppezzo (Ed.) *Chronic Lymphocytic Leukaemia*. Intech Open Access Publisher. ISBN 978-953-307-699-7; Dempsey, N.C., Leoni, F.L., Hoyle, C.F. & Williams, J.H.H. (2011). Analysis of Heat Shock Protein Localisation using Flow Cytometry. In S. K. Calderwood & T. L. Price (Eds.). *Methods in Molecular Biology. Molecular Chaperones: Methods & Protocols*. (pp. 155-164). New York, USA: Humana Press. ISBN 978-1-61779-294-6; Ireland, H.E. & Williams, J.H.H. (2011) Measuring Hsp72 (HSPA1A) by Indirect Sandwich ELISA In S. K. Calderwood & T. L. Price (Eds.). *Methods in Molecular Biology. Molecular Chaperones: Methods & Protocols*. (pp. 145-153). New York, USA: Humana Press. ISBN 978-1-61779-294-6.

Examples of evidence of esteem are given below:

Membership of Professional and Advisory Bodies related to Research

MRC college of experts (Cooper); Clinical Programme Group for Primary Care and Public Health (Kennedy); North Wales Clinical School Executive Committee (2010-2012) (Kennedy); Public Health Commissioning Group for Wrexham (2008-2013) (Kennedy); Wrexham Healthy Eating Being More Active Partnership Board and Author of Strategy (2008-2013) (Kennedy) ; BCU Health Board Obesity (Clinical & Community) Pathway Board (2011/12) (Kennedy); Chair BCU Health Board Obesity Pathway Primary Prevention Group (2012-2013) (Kennedy)

Membership of Editorial Boards

International Journal of Food Science and Technology (Bonwick); Journal of Clinical Nursing Studies (Dickinson); Journal of Intellectual Disabilities (Lovell)

Keynote and Invited Addresses at International Conferences

Lovell: Chair 1st International Conference on Intellectual Disabilities and Criminal Justice in 2010; Williams: 1st Conference of the South American Chapter of CSSI, Montevideo, Uruguay. March 2014; 6th International Symposium on Heat Shock Proteins in Biology and Medicine. Washington, USA. November 2012; 10th Workshop on the Molecular Biology of Stress Responses. Porto Alegre, Brazil. May, 2012; 5th International Symposium on Heat Shock Proteins in Biology and Medicine: Heat Shock Proteins in Cancer and Immunology. Woods Hole Marine Biology Laboratory, Woods Hole, MA, USA, November 2010; 4th International Symposium on Heat Shock Proteins in Biology and Medicine: Heat Shock Proteins in Cancer and Immunology. Woods Hole Marine Biology Laboratory, Woods Hole, MA, USA. November 2008; 6th International Conference on the Molecular Biology of Heat Shock Proteins. Bangkok, Thailand. March 2008.