Institution: University of Roehampton

Unit of Assessment: Panel A, UoA 3 Allied Health Professions, Dentistry, Nursing and Pharmacy

a. Overview

Allied Health, which is located in the Department of Life Sciences, is an expanding specialist research unit whose current submission of 10 FTE, compared with 3.8 FTE in RAE 2008, demonstrates the significant investment the university has made in this area. We conduct translational research in specific areas of biomechanics, the regulation of metabolism, neurosciences, and cell biology and microbiology, and have strong and productive collaborations with academic centres of excellence in the UK and abroad.

b. Research Strategy

Since 2008, the department has undertaken a strategic realignment of its specialist areas. We have used substantial university investment both to strengthen the neuroscience group and to widen our research base, whilst keeping a focus on translational research. As a result, Health now has an emphasis on identified areas of strength within the fields of **biomechanics, the regulation of metabolism, neurosciences** and **cell biology & microbiology**. The overarching strategy since the RAE and for the next five years has been four-fold: to continue to invest in these areas of strength so as to contribute to the creation of a body of knowledge that can be harnessed to serve urgent and important needs within society; to develop high quality internal and external collaborations; to further increase the involvement of the end users of our research; and to fully integrate research students into the research environment. The success of this strategy can be seen in each of our strategically selected areas.

The biomechanics and the physiology of ageing. One of the world's greatest challenges in the 21st century is the growing pressure on healthcare and social services due to an ageing population. Current work on age-related biomechanical changes in the spine and muscular strength and fatigue in older adults is central to our strategy and will inform further research projects in the area of biomechanics. We are continuing to expand our portfolio of research into ageing and physical activity and, because it is the fastest growing sector, we are particularly focusing on the oldest age group – those aged 85 years and over. Luo's work, for example, investigates the biomechanical mechanisms underlying the ageing spine **(Luo)**. This work involves the use of engineering and experimental methods to understand how ageing affects muscles and intervertebral discs, and the development of creep deformities as a result of osteoporosis (e.g. output in *Bone, 2009*). **Luo** is now studying the effect of physical activity and exercise on balance and functional performance in the elderly and working with Bristol University's Department of Anatomy on bone creep behaviour. Studies on the neural, morphological, and mechanical factors that influence skeletal-muscle strength in humans have been carried out *in vivo* by **Tillin** (output in *Proc Royal Soc B,* 2012), who has also investigated how these factors can be adapted with training (output in *Exp Physiol*, 2012). In 2012, he held a visiting researcher post at Loughborough University, to build on the work of his *PRoy Soc* article. He is currently using the data he collected during this time to support grant applications for the expansion of his basic research on the assessment of the ageing neuromuscular system.

Patterson's contribution is expanding the range of our biomechanics research to include metabolic measures of ageing and obesity. Current projects are supported by industrial partners (Efamol Ltd/ Wassen Intl Ltd) on the effects of diet on muscle and cognitive function (with **Dyall**) and Patterson also works on neurohormonal appetite regulation. The Biomechanics group is also applying to Arthritis Research UK (ARUK) for funds to support their research on the relationship between physical loading and bone turnover in postmenopausal women with low bone density, and to the National Institute of Health Research (NIHR) to develop a novel device for the assessment of bone loading during physical activities. The focus on ageing has allowed us to build on the synergies within on-going work across each of our areas of expertise, namely the neurosciences, biomechanics, physiology of ageing, and the regulation of metabolism in relation to ageing. For example, a new collaborative project (led by **Dyall**) integrates neuroscience, nutrition, biomechanics and metabolism in ageing, in an investigation into the effects of omega-3 fatty acids in postmenopausal women. The work is due for completion in 2014.

The University is a member of the South West London Health and Social Care System, from whom we have received a grant to explore the use of accelerometers to study mobility and balance in the clinical setting. This project has very promising impact potential and it has helped us to develop strong clinical links with St. George's University of London and facilitate their work on mobility

assessment of the elderly. This has resulted in further publications with significant clinical impact. The group has also developed a link with the Northwest London group of the National Osteoporosis Society with **Luo** as the key contact. This user group plays a key role in shaping our programme of research on ageing as we believe that users are not simply consumers of our research but key drivers in the process of research. The involvement of users is essential to our success in translating research into applications which are of relevance to society. The work of **Luo** et al. has contributed significantly to our understanding of the osteoporotic spine. For the first time, they have demonstrated how osteoporosis might protect disc degeneration, and how bone creep may lead to vertebral deformities. In recognition of this work, **Luo** received the Best Paper award at the 2010 Annual Congress of Britspine, an umbrella organisation for spinal research in the UK.

Our commitment to the translation of our research for applied purposes is also exemplified by two further researchers in biomechanics, who have been concentrating on research impact work for much of the current period (see case studies). **Lee**'s work on biomechanical analyses of age-related changes in muscle strength and mechanical signals during physical activity has been the basis for a collaboration with colleagues in our Dance Department on the novel development of dance as a clinical intervention for Parkinson's patients. **Strike** has been bringing to fruition her earlier programme of biomechanical research on the movement of lower limb amputees, working with a specialist prosthesis manufacturer to explore how best to support their rehabilitation.

The regulation of metabolism. The area of metabolic studies is led by **Patterson,** whose perspective complements and enhances **Luo** and **Tillin**'s work on physical activity in healthy ageing, and on ageing with obesity. **Patterson**'s research expertise spans a broad field, from animal models (outputs in *Endocrinology* and *Gastroenterology*) to clinical studies of obesity (output in *Diabetes*). He is conducting a long-term programme of research on the regulation of metabolism in obesity, in collaboration with Imperial College (Professor Bloom's group), which draws on his expertise in the neuroendocrine regulation of appetite. We are addressing the public health issue of the ageing population by linking and integrating our work on the biomechanical and physiological changes in those aged 85 years and over with age-related metabolic changes, thereby capitalising on our combined strengths in biomechanical and metabolic research.

Neuroscience Since 2008, we have further developed an established neuroscience group with a focus on translational research and an ultimate objective to deliver impact outside academia. This work spans several discrete specialist areas led by individual researchers who collaborate with one another, within the Health unit and externally. One of those areas comprises studies on the neural mechanisms of trauma and recovery within the central nervous system, including the spine (**Dyall** and **Lacroix**). The spine injury theme also overlaps with the interests of biomechanics (**Luo**). Several staff members are interested in the role of omega-3 fatty acids in neuroprotection and ageing (**Dyall** with **Lacroix** and **Molina-Holgado,** in collaboration with Professor Michael-Titus of Queen Mary University of London). These studies have been externally funded by a charity grant (The Dowager Countess Eleanor Peel Trust, awarded to **Dyall**, **Molina-Holgado** and **Opacka-Juffry**) and Efamol Ltd (**Dyall**), with output to be submitted to *J Neurosci*. The theme of cellular mechanisms of neurodegeneration and neuroprotection is strongly represented in the research conducted by **Molina-Holgado**, who is internationally recognised for his work on the role of endocannabinoids in brain repair (outputs in *Glia, Br J Pharmacol* and *J Neurochem*). Thus, our research programme on the relationship between omega-3 fatty acids, endocannabinoid signalling and neurogenesis represents the confluence of expertise within the group in this topical area of translational neuroscience. **Molina-Holgado** is collaborating with the University of Manchester, King's College London, the University of Bath and the University of Stavanger, Norway, as well as with the National Paraplegics Hospital, Toledo, Spain, in the areas of brain repair and endocannabinoid signalling in the context of age-related brain disorders. Our studies on neuroprotection are clearly set in the context of age-related brain disorders such as Parkinson's and Alzheimer's diseases. The group's research in the area of novel therapy approaches to Alzheimer's disease has been supported by West Focus, which resulted in a patent on the neuroprotective kisspeptin compounds, being filed by Roehampton in November 2012.

A programme focused on the effects of environmental factors, such as stress and drugs abuse, on the brain is led by **Opacka-Juffry.** She and Dr Pryce of Zurich University Hospital for Psychiatry collaborate in the area of preclinical studies on depression (Pryce is an honorary research fellow in the Health Sciences Research Centre [HSRC]). They have characterised the neural correlates of

depression-like behaviour in the rat model of early life stress (output in *Neuropharmacology*), which led to further research on prenatal stress (**Opacka-Juffry** with Professor Gillies of Imperial College London). A PhD project, funded by Roehampton, has been linked with this programme, in which they have documented stress-dependent hippocampal remodelling and changes in the oxytocin regulation (in prep., *Neuroendocrinology*); **Molina-Holgado** has collaborated on work to explain the effects of stress hormones on cell signalling *in vitro*. Another PhD project in this field, examining the neurobiological mechanisms of depression: the effects of glucocorticoid administration in rats, was fully funded by GE Healthcare. **Opacka-Juffry**'s research further contributed to our understanding of the links between early life stress and oxytocin in humans (output in *Stress*) and neurobiological correlates of resilience (output in *Psychoneuroendocrinology*), both being highly topical areas. Our strategy to cross-collaborate within the Health unit has resulted in **Patterson** contributing to the stress programme through research on the CNS pathways linking stress and obesity and investigating the role of metabolic signals in neuroprotection (with **Molina-Holgado**). In addition, **Lacroix** is contributing to this programme with his past experience of preclinical neuropsychiatry research (outputs in *Psychopharmacology* and *Behav Pharmacol*).

Opacka-Juffry's current collaboration with Davidson (honorary research fellow in the HSRC) and Ramsey (both at St George's University of London [SGUL]) on the effects of novel psychoactive drugs on the brain has received international media attention following the press conference at the Festival of Neuroscience 2013 (publ. in *Prog Neuro-Psychoph Biol Psych)*. In response to the global priorities in research on addiction (WHO, 2013), she plans to continue this collaborative work by expanding it to newly emerging unclassified drugs. The group is also building links with industry to secure funds for translational research - **Molina-Holgado** with GW Pharmaceuticals, **Lacroix** with Eisai and Novartis, and **Dyall** with Efamol, capitalising on their ongoing successful collaboration. **Dyall** and **Lacroix** will further their collaborative links with the Centre for Neuroscience and Trauma, Queen Mary University of London, where on-going projects include an investigation of the neuroprotective role of omega-3 fatty acids in spinal cord injury and lipidomics profiling in Amyotrophic Lateral Sclerosis (**Dyall**'s outputs in *PLoS One, J Neurosci* and *Neurobiol Dis*) and regulation of pain responses (**Lacroix** with **Dyall** and Professor Michael-Titus).

Cell biology and microbiology This research centres on the molecular and cellular mechanisms of cell adhesion with a focus on haemotopoietic cells (**Calle-Patino**), microbial virulence and resistance to antibiotics (**Hornsey, Letek**). Both areas are highly topical for current clinical applications and these researchers are aiming at translational impact in terms of therapy developments, e.g. in multiple myeloma (**Calle-Patino**). There is cooperation in this work between the cell biology and neural stem cell labs (with **Molina-Holgado**). Our research on cell signalling changes underpinning the biology of haematopoietic cells and the pathology of myeloma is led by **Calle-Patino,** who has published widely in this field (outputs in *Leukemia*, *Blood*, *Haematologica*, and *PNAS*). She is maintaining the focus of her research on the role of adhesion and migration in haematopoietic cells and the cellular interactions in the tumour microenvironment in haematological malignancies. **Calle-Patino** currently co-directs projects funded by the British Heart Foundation and Leukemia Lymphoma Research, and she is applying for further grants to Leukemia Lymphoma Research, the Royal Society and for the Discovery Award at the Discovery Committee CRT-CRUK (Cancer Research Technology-Cancer Research UK). She is also conducting research into the molecular mechanisms of cell adhesion with staff in the Haematology Department at King's College London, the Department of Haematology at Oxford University, the LeBow Institute for Myeloma Therapeutics, the Jerome Lipper Center for Multiple Myeloma, the Dana-Farber Cancer Institute and the Harvard Medical School.

The microbiology team of the HSRC is researching the development of novel therapeutic strategies to treat infections caused by multidrug-resistant (MDR) bacterial pathogens (**Hornsey** and **Letek**). Their complementary approaches are aimed at developing new ways of controlling emerging and re-emerging bacterial pathogens in both healthcare facilities and the community. **Hornsey** focuses on defining the mechanisms of resistance to antibacterial agents of last resort, developing diagnostic tools and investigating the *in vivo* efficacy of novel antibacterial agents active against MDR Gram-negative pathogens using an invertebrate model of infection (outputs in: *J Antimicrob Chemother; Int J Antimicrob Agents; J Clin Path; Antimicrob Agents Chemother; Eur J Clin Microbiol Infect Dis*). **Hornsey** also has productive, on-going collaborations with Public Health England (formerly, Health Protection Agency), Queen Mary University of London and Queen's

University Belfast. He has worked closely with colleagues in the NHS, academia and pharmaceutical sectors both nationally and internationally. **Letek**'s research is focused on the identification and characterization of the molecular factors that are involved in the intracellular survival and proliferation of different Gram-positive bacterial pathogens (outputs in *EMBO J, PLoS Genet, J Biol Chem, Mol Microbiol, J Bacteriol*). He aims to identify new targets for novel antimicrobial strategies that could help circumvent the problem of multiple drug resistance without affecting the host cell viability. He collaborates with the University of Edinburgh, Wellcome Trust Sanger Institute, Cancer Research Centre of Salamanca (Spain) and University of León (Spain).

Regular group activities are undertaken within the HSRC, facilitating the integration of approaches from the science disciplines we represent, creating a forum for productive discussion and cross-fertilisation of new ideas, and facilitating future research collaborations within and outside the unit. Thus we hold a weekly series of research seminars at which external speakers, our staff and PhD students present their research in a friendly and discussion-promoting atmosphere. Our technicians commonly attend, as well as staff from other research areas of the department and university. Amongst the external speakers who have contributed are internationally renowned academics, for example: Prof. David Baker (Department of Neuroscience and Trauma, Blizard Institute of Cell and Molecular Science, Queen Mary University of London), Prof Maurice Elphick (Queen Mary University of London), Prof. Simon Jackson (University of Plymouth), Prof Kenneth Smith (Institute of Neurology, UCL), Dr Christopher Pryce, HSRC honorary research fellow (Psychiatric University Hospital Zurich, Switzerland), Prof. Andy Smith (Cardiff University) and Dr Gareth Williams (Wolfson-Centre for Age-Related Diseases, King's College London). Seminars have often been an important step to new external collaborations (e.g. with Queen Mary University of London). We have hosted well-attended public lectures: Professor Nick Bosenquet of Imperial College spoke on 'Health Futures' in 2008 and Professor Peter Kopelman of SGUL spoke on 'Obesity – still crazy after all these years' in 2010. We also organise specialist conferences and symposia bringing together researchers around themes related to our research, for example two conferences on polycystic ovary syndrome (PCOS) in collaboration with the charity PCOS UK (2009 and 2011) and an open research day on the impact of our research entitled "Current and future impact of Health Sciences research at Roehampton", sponsored by biotech companies R&D Systems and Randox in June 2013.

c. People, including:

Staffing strategy and staff development Focused and sustained university support for Health has provided investment in new posts and the resultant expansion of the unit, from 3.8FTE in 2008 to the current team of 10 full-time permanent researchers. Staff who have retired or moved to other institutions have been replaced strategically, guided by the explicit aims of strengthening existing expertise in neuroscience and biomechanics and enhancing our impact by creating a group with a research base in translational research.

A peer mentor is appointed for all new staff. Senior staff are responsible for supporting early career staff to establish their research at Roehampton. Individual research plans, coupled with annual review, ensures that all staff are supported in the ongoing development of their personal research profile and that they maximise opportunities for impact. Early career researchers are supported in terms of writing for publication. Research active staff are allocated dedicated research time via a comprehensive workload model, with allowances of 40% for research and additional allowances for the development of impact. A sabbatical term is available every three years. Further short term, concentrated research time is arranged for specific activities such as research collaboration visits. Care is taken that appropriate research facilities and technical assistance are available for new appointees. All new staff may apply for research start-up money during their first two years in post (£3-13K awarded per person in the assessment period).

All supervisors of research students undergo mandatory training, comprising a SEDA-accredited course for new supervisors or a short course for experienced supervisors new to Roehampton, plus at least one session a year from the programme of the Supervisor's Forum. Each research student has two supervisors, one of whom has previously supervised to completion and who is responsible for mentoring inexperienced supervisors.

Equal opportunities We have representatives on the panel currently working on a University-wide application for the Athena SWAN Bronze Award, which recognises commitment to advancing women's careers in STEMM subjects in higher education.

Research students The UoA has seen a rapid growth in PhD student numbers – from five in 2008 to 14 now, as supervisory capacity has increased. During the assessment period, six research students were supported by Roehampton bursaries (full studentships), while five were mainly self-funded (one of those has been partly supported by a Roehampton stipend and research expenses funded by King's College London). Further students were supported by a full-time studentship funded by the Arthritis Association, the Private Physiotherapy Foundation, an Internal Competitive Research Grant of the Hong Kong Polytechnic University, and by industry (GE Healthcare, part-time). The internal research bursaries were allocated strategically and competitively to support our research foci. Ten students have completed since 2008.

Careful attention is paid at the selection stage for research students, through application and interview, to ensure that there is a very good fit between the proposed research and the unit's areas of activity. All research students are members of the university's Graduate School, which provides opportunities for peer networking and social integration, as well as more formal training. Research students have staff-level access to university facilities such as common rooms and IT systems and individual desk space adjacent to that of their Directors of Studies. In line with the Researcher Development Framework, the Graduate School co-ordinates the University's Research Student Development Programme, a clearly articulated 3-tier programme of training, combining generic and careers-related training, plus interdisciplinary events and events relating to impact organised by the Graduate School. Subject specific research methods training is provided by the Department of Life Sciences and our research students benefit from linkages with the Health Sciences and Sport Sciences masters programmes taught in the department; these programmes include specialist lectures from external clinical researchers, many of which are relevant to PGR students as well. The Graduate School also provides induction and a buddy system for new students, and supports student-led events such as the annual research student conference. The University has adopted the model of support whereby each new research student is assessed on entry to provide a detailed profile of their training and development needs. This is then used to create a tailored skills development and support programme from the University provision and more locally in Life Sciences.

As well as attending departmental research events, each research student gives at least two research seminars on their work in progress, helping them to develop their presentation skills and to learn the importance and value of science dissemination and its impact. In addition, students are encouraged to give talks and/or present posters at national and international conferences. Students are helped to apply for external travel grants to aid attendance and have applied successfully to the British Neuroscience Association and the Nutrition Society. A departmental fund for research training, specific to individual projects and conference attendance, provides up to £600 per student.

d. Income, infrastructure and facilities

At the start of the assessment period, the unit set out to generate more external income and success has been on an upward curve, with direct external research funding coming from industry, UK based charities, government agencies and Health Authorities. We have a co-ordinated system for supporting and developing funding applications, augmented by central University support with regards to finance arrangements, contracting and IPR.

Extensive work is underway to increase our income further. For example, **Luo**, with internal and external collaborators (e.g. Professor Compston, University of Cambridge), is applying to the EPSRC for a grant to study the influence of obesity on the risk of ankle fracture in people with osteoporosis. **Patterson** has applied for funds to the Society of Endocrinology and Diabetes UK, and is applying to the Tanita biotech company to prepare for a joint application to the BBSRC with external collaborators from Imperial College, with whom he previously worked. He is also continuing to work with collaborators to apply for funds from Kellogg's, building on a current successful collaboration with this industrial partner. **Dyall,** in collaboration with St George's Hospital NHS Trust, has also submitted a grant application to the Humane Research Trust to quantify essential fatty acid intake in extremely pre-term infants, which has a strong potential to deliver impact. Our early career researchers are applying for grants from the Royal Society, Leverhulme Trust Research Fellowship, Wellcome Trust New Investigator Award, BBSRC and the European Commission (i.e. Marie Curie Actions and Career Integration Grants).

The University Research Committee, chaired by the Vice-Chancellor, overseas institutional research strategy, fosters new initiatives, allocates strategic investment and monitors research

quality. Ethics approval requests are considered by a University Ethics Committee with a representative from each department. Research activities are coordinated locally by the Department of Life Science's Research Advisory Group. The integration, planning and daily support of the UoA's research activities are enabled by the Research Office and a full-time Department Research Facilitator, with a background in life sciences research. The Facilitator supports bidding, facilitates the development of networks and partnerships, maintains mailing lists, organises web development and supports web organisation. A dedicated academic works to support the development of impact across the institution, and chairs an impact advisory group that coordinates this activity and encourages its strategic development.

Our biomedical facilities provide excellent laboratory resources for our research in cell biology, microbiology, neuroscience and metabolism: we are supported by highly qualified technical staff (5.6 FTE), four of them holding postgraduate degrees (MScs and one PhD).

In addition to its recurring annual capital equipment budget provided by the department, Health has secured an injection of £164K from a University capital equipment fund, in order to update and maintain the £56m purpose-built (and well-equipped) biomechanics, physiology and biomedical laboratories created in the previous period with support from SRIF2 and SRIF3 funding. A further £280K was provided in 2012 to equip laboratories to support the expansion of the department's research programme.

The biomechanics laboratory occupies 150m^2 and houses the Vicon motion analysis system, comprising three Kistler force plates and nine infrared cameras. It is also equipped with a 16-channel Noraxon wireless electromyography system, Biometrics electrogoniometer sensors, two isokinetic dynamometers (one Cybex and one Kin Com) for strength testing, the Fastrak electromagnetic motion tracking system, a 3D ultrasound imaging scanner (Sonosite), two analogue-to-digital convertor systems (Data Translation and Cambridge Electrical Devices) for integrating a variety of biomechanical data, and a large range of inertial sensors (accelerometers, gyroscopes, and integrated sensing units). It has the full MATLAB suite for computational analysis. *The exercise physiology laboratory* has an environmental chamber, a range of devices for cooling the human body and measuring body temperature, a Digitimer electrical stimulator for neuromuscular function assessment, devices for blood gas analysis, two running treadmills (one recessed to ground level and the other mobile), several ergometers, a DEXA scanner for bone mineral density analysis, a Bod Pod for body composition analysis, and a range of anthropometric measurement tools. Both laboratories are well placed to support our research on skeleton-muscular ageing. They offer various choices of motion analysis systems (optical, electromagnetic and inertial) for studying the biomechanical functions of the elderly. The ultrasound scanner and the Cyber and electromyography systems are used in studying muscle morphology and functions. A combination of the ultrasound scanner and the electromagnetic tracking system enables 3D reconstruction of the ultrasound images of the spine. The various inertial measurement units allow us to undertake measurements outside the laboratory and to examine the 24 hour physical activity patterns of the elderly. MATLAB is used for data processing. *The biomedical laboratories* comprise facilities for neuroscience, cell biology, immunoassay, fluorescent and immuno-histochemistry and quantitative microscopy with stereology (MicroBrightField). We have two high specification liquid chromatography systems and a laboratory designated for work with radioactive isotopes, which is shared across different research applications, including neuroscience and metabolic studies within Health, and Biological Anthropology within the Department. We also have access to the Anthropology imaging lab, with its microCT scanner (pQCT) which we use for brain volume analysis (Health PhD project and collaboration with Imperial College). Cell culture and *in vitro* imaging facilities are used in our neural stem cell and cell biology research. Modern analytical equipment has been added for use in cell biology and metabolic studies since 2008; this includes a flow cytometer, a real-time polymerase chain reaction (RT-PCR) machine with a Nanodrop spectrophotometer, a fluorescent plate reader and a gas chromatograph with flame ionisation detector. In addition, we purchased a cryostat and Bodystat 4000 multi-frequency quadscan.

e. Collaboration and contribution to the discipline or research base

Research honours, awards and prizes. Dyall, Honorary Visiting Research Fellow, Centre for Neuroscience and Trauma Queen Mary University of London (from May 2010, contract renewal due May 2014); Hornsey, UK Young Ambassador of the American Society for Microbiology (since March 2013, initially for one year). **Luo**, Best Basic Science Paper Award: British Spinal Society Annual Conference, April 2010, Liverpool; Best Poster Award: British Spinal Society Annual

Conference, April 2010, Liverpool. **Tillin**, Nominated by Loughborough University from all PhD graduates in 2011, for entry into the British Association of Sport and Exercise Science, Professor Tom Reilly Doctoral Dissertation of the Year Award.

Keynote lectures or invited addresses. **Calle Patino**, Invited seminar in CIC Biogune: Regulation of the actin cytoskeleton by WASP and WIP: implications for haematological malignancies 2008, Derio, Bizkaia (Spain); Invited speaker at the meeting "Invadopodia, podosomes and tissue invasion" 2009, Hyeres (France). **Dyall**, Invited speaker Rank Prize Funds, Mini-Symposium on Long Chain n-3 Polyunsaturated Fatty Acids in the Human Diet – Health and Sustainability Issues, Grasmere 2013; Invited speaker and session chair: 9th Congress of the International Society for the Study of Fatty Acids and Lipids, Maastricht 2010; Invited speaker: 10th Fatty Acid and Cell Signalling Meeting, New Orleans 2011. **Hornsey**, Invited speaker at the American Society for Microbiology meeting September 2013. **Lacroix**, Addex Pharm., "in-vivo neurobiology support for drug discovery", Geneva, Switzerland, Apr 2009; Pfizer, Cambridge, "Neurochemical fingerprinting for cognition and schizophrenia", UK, Jan 2009; Zentrum für Molekulare Neurobiologie Universität Hamburg, Germany, Jan 2000. **Luo**, The 18th Interdisciplinary Research Conference on Injectable Biomaterials/ Biomechanics for Minimally Invasive Clinical Application, Montreal, Canada, May 2008; the Biology and Biomechanics conference– Bridging the Gap, Cardiff, UK, June 2008. **Molina-Holgado,** Organizer and Chair of the Symposium "Brain Repair and Cannabinoid Signalling" European Society for Neurochemistry: Biochemical Society 5th meeting (Bath, UK, June 2013). Organizer and Chair of the British Pharmacological Society Winter Meeting Symposium "Cannabinoid Signalling in Brain Repair" (2009). **Opacka-Juffry,** BNA Festival of Neuroscience (FoN) 2013 - Symposium on early life stress (chair and speaker); Invited to speak at the international press conference at the Festival of Neuroscience 2013 (only 3 invitations to the press conference with over 900 presentations at FoN). **Tillin**, *Invited Speaker*, Determinants of rate of force development: implications of past research. *Fourth Sobre Entrenamiento Group Training Physiology on-line International Symposium*, December, 2009.

Peer reviewing. **Calle Patino,** Mol Biol Cell and J Cell Sci. **Dyall**, Can JPhysiolPharmacol, Int J Mol Sci, J Neurosci Res, JNut Biochem, Nutrients, Trends Neurosci. **Hornsey**, JAntimicrob Chemother; InternJAntimicrob Agent, J Med Microbiol. **Lacroix**, Behav Pharmacol. **Letek**, FEMSMicrobiol. **Luo**, JBiomech ; Clin Biomech; JSports Sci ; Eur J Sport Sci Med Eng Phys ArchPhys Med Rehab; J Phys Act Health. **Molina Holgado,** Member of the Editorial Board of Springer Science Reviews; Member of the Editorial Board of Datasets Papers in Neuroscience; Peer reviewing: Biochem Pharmacol, BMC Develop Biol, Brain, Brain Res, Br J Pharmacol, Drug Alcohol Rev, Exp Rev Mol Med, J Cell Biochem, J Cell Biol, JInt Immunopharmacol, J Neurochem, J Neuroimmunol, J Neuroinflam, J Neurosci Res, J Psych Res, Life Sci, Mol Cell Neurosci, Neuropharmacology, Neuroscience, Pharmacol BiochemBehav, Prog Neurobiol, Regener Med. **Opacka-Juffry,** Behav Brain Funct, Int JPsychophysiol; IntJNeuropsychoph; JCell MolMed, Neurobiol Learn Mem, Neuropharmacology, Neurosci Lett. **Patterson**, Peptides. **Neale,** JAppl Physiol; Med Sci Sport Exer; Am J Phys Anthropol; JAppl Biomech; JSports Sci; Eur JSport Sci; Clin Physiol **Research grant reviewer**. **Calle-Patino**, Wellcome Trust; the Spanish Ministry of Education and Universities; and the Research Grants Council, Hong Kong. **Dyall,** Medical Research Council (MRC); US Army Medical Research and Materiel Command (USAMRMC); and the American Institute of Biological Sciences (AIBS). **Hornsey**, British Society for Antimicrobial Chemotherapy. **Letek,** MRC. **Luo,** Reviewer for the European University of Cyprus Research Grant (2013). **Molina-Holgado,** Alzheimer Research Society (UK), The Health Research Board (Ireland), The Medical Research Council (MRC) UK, BBSRC (UK), The Wellcome Trust (UK) and The USA-Israel Binational Science Foundation (USA). **Opacka-Juffry,** MRC (multiple reviews), BBSRC, the Royal Society. **Tillin,** BBSRC - November 2013.

Service on external bodies and committee membership and advisory positions. Molina-Holgado, Elected Member of the Meetings Committee of the British Pharmacological Society (2013-2016); Founding member of the Society of Spanish Researchers in the United Kingdom (SRUK)/Comunidad de Cientificos Espanoles del Reino Unido (CERU), (2012). **Opacka-Juffry,** Neuroscience advisor at the Neuroethics Network UK (led by Manchester/Bradford, funded by AHRC) since 2012.

Doctoral examining. Unit staff have examined PhD theses in the UK and abroad (e.g. Imperial College London, Bristol University, University of the Basque Country).