Institution: London South Bank University (LSBU)

Unit of Assessment: Sport and Exercise Sciences, Leisure and Tourism

a. Overview

This submission is from the Sport and Exercise Science Research Centre (SESRC) in the Faculty of Engineering, Science and the Built Environment (ESBE). The SESRC team consists of 14 members of staff, 11 of whom are returned in this submission. Since 2008, research has been consolidated into a single multidisciplinary team, operating on a project-specific basis within three core research themes: *movement neuroscience, nutrition and metabolism, and clinical and applied sciences.*

During the review period we have invested significantly in enriching our research expertise and infrastructure base. This has resulted in a significant increase in the volume, quality and outreach of our research activities compared to RAE2008. We achieved: (i) an 83% increase in submitted staff; (ii) a four-fold increase in income from research grants and capital investment; (iii) a three-fold increase in peer-reviewed original research and review articles, attracting over 2500 citations. The SESRC team has delivered over 100 conference communications, 23 keynote and invited presentations and has actively contributed to the development and implementation of new policies and programmes within Sport via national and international advisory and management boards of academic and professional institutions and government agencies.

The SESRC team has achieved significant international impact from its applied research in the fields of Biomechanics, Human Physiology and Nutrition, and has contributed to 10 new patents and patent applications, all of which have been commercialised by our partners worldwide.

SESRC research takes place in 7 dedicated laboratories located in the main LSBU campus in Southwark including three new cutting edge laboratories established within the REF2014 period. The SESRC team continues to work closely with the University's Academy of Sport as a conduit to professional bodies within National Sport and community organisations. In addition, the SESRC's Human Performance Centre (HPC), set up in 2008, provides an effective route for the commercialisation of its research. In line with the LSBU Corporate plan, the focus on infrastructure development to create an environment where students and staff alike can flourish has created the stage upon which the next 5 years can be built with confidence.

b. Research strategy

The SESRC's strategic aims are to: (i) undertake high quality research in exercise, physical activity and health, (ii) apply this knowledge to optimise human performance and improve practice by applied sports and clinical professionals, (iii) research and develop novel technologies and methodologies leading to improved human capacity and quality of life.

In RAE2008, our stated objectives were to: (i) *expand the volume and scope of the SESRC's activities*. This has been achieved by a combination of strategic appointments, internal promotions and investment in infrastructure such that an increased number of staff are being submitted to REF2014 (11 vs. 6); (ii) *develop new and enhance existing national and international research collaborations*. We have more than doubled the number of active inter-departmental, national and international research partnerships e.g. German Institute of Sport (2009), University of Oulu, Finland (2011); (iii) *increase the number and quality of peer reviewed publications (target: 2 per staff per annum).* This target has been met. The SESRC team has published166 peer-reviewed papers (vs. 51 in RAE2008) and produced 37 confidential reports from research with industry. The SESRC team has delivered over 100 conference presentations (vs. 57) and 23 keynote and invited lectures (vs. 3) and been named inventors on 10 new patent applications (vs. 5), all of which have been commercialised worldwide; (iv) *increase research studentship numbers by at least 50% (target: 12 fte research students).* In the REF2014 period 10 PhD students have registered at SESRC. Although staff turnover has delayed progress in this area this has now been rectified through matched-funded research studentships with, for example, McLaren Applied Technologies and Fitflop; (v) *grow external research income (target: £100k per annum).* The SESRC team has attracted substantial income over the REF2014 period from research grants and contracts (£606k vs. £316k). In addition, we have achieved income from consultancies (£306k) and from investment

in research capital (£625k); (vi) *build upon our growing reputation for applied research through knowledge transfer activity.* Since 2008, we have delivered 5 knowledge transfer projects, including 2 Knowledge Transfer Partnerships (KTPs). In addition, we have invested significant funds in new facilities, for example, 3 new state-of-the-art laboratories were established (Movement analysis, Elite Human Performance and Perception-Motor Control) in support of our research aims.

These achievements mark a considerable increase in outcomes and impact from research compared to our RAE2008 submission. The strategic investments in infrastructure, staff expertise and development, together with increased national and international visibility via industrial and public engagement and dissemination activities, have advanced our existing core research areas and initiated new research directions.

Over the assessment period, SESRC activities have been consolidated into a single multidisciplinary team operating under a strategy designed to encourage and facilitate interaction of the fundamental research strengths within the team. Our efforts have been focused on the delivery and growth of activities in our core themes:

1. **Movement Neuroscience**: Interdisciplinary experimental approaches, supported by computational analyses and mathematical simulations, were used to facilitate cutting-edge research focused on understanding the control of human movement. The involvement of corticospinal neural pathways and peripheral excitatory and contractile processes in the development of deficits and recovery in motor function were evaluated using prolonged voluntary exercises and evoked muscle contractions (**Mileva**, **Sumners**, **James**). Neuro-mechanical analyses were adopted to gain understanding of stability and movement strategies during gait with a specific focus on the foot and ankle complex (**James, Mileva**). Intrinsic and extrinsic factors influencing intra- and extracellular muscle action potentials were investigated to inform correct interpretation of the surface electromyography (EMG) parameters for evaluation of central and peripheral factors in muscle fatigability (**Arabadzhiev**). Higher-order central processing has been investigated to elucidate the influence of body movements on cognitive function and optimisation of sensorimotor strategies (**De Oliveira, Raab**).
2. **Nutrition and Metabolism**: The projects under this theme were designed to improve understanding of the inflammation processes that occur due to training (**Sumners**), mechanical (**Szabo**) and metabolic (**Mileva**, Hunter, **Sumners**) stress, gastrointestinal pathologies (Hawkins, **Taraban**), and obesity (**Cunliffe**). We studied the body fat percentage as a determinant of inflammatory status and distribution and the role of the melanin concentrating hormone in energy balance (**Cunliffe**), the mechanisms of lymphocyte activation and the T-cell function regulation in inflammatory responses, with particular emphasis on muscular-skeletal, intestinal and skin inflammation (**Taraban**). The benefits of ergogenic aids such as metabolic (e.g. hydration and hypoxia), nutritional (e.g. antioxidant and herbal drinks, caffeine), electromechanical (e.g. electrical stimulation, graduated compression garments and whole-body vibration) and psychological (e.g. Activity4Charity) interventions for improved muscle function, physical and cognitive performance were evaluated.
3. **Clinical and Applied Science**: Hypoxia added during training for enhanced repeated sprint ability was investigated to identify the benefits for athletes from intermittent sports (**Sumners**). Novel spectral EMG indices were developed, experimentally and mathematically investigated, and applied in athletic populations to reliably evaluate muscle fatigability specific to prior training type and fitness level (**Mileva, Arabadzhiev**). Understanding of perception-motor control strategies has been used to enhance decision making in sports (**Raab**) and skill acquisitions in adolescents with developmental coordination disorders (**De Oliveira**). The role of psychosomatic factors in the coping behaviour of athletes and team efficacy has been elucidated in various sports (**Allen**). Novel computational (heart rate variability analysis) and experimental (microneurography) approaches were developed to study the interaction between physical activity and autonomic nervous system regulation, and to inform optimal training/exercise prescription in athletic and clinical populations (**Tulppo**). Experimental models (e.g. arthritis, bone and mucosal pathology, cancer) were used to understand inflammatory responses in metabolic disorders and training/exercise associated muscular damage (**Taraban**).

SESRC activities are led by a research Director (Mileva, since 2011), supported by the Faculty Research and Enterprise Committee (FREC) and overseen by the Faculty Executive Committee via the Director of Research, who chairs the FREC. The SESRC Director is a member of the FREC and represents the team on the Board of the Academy of Sport (established by SESRC in 2002). The relationship with the Academy provides the SESRC with direct access to sports governing bodies and to the local community in the London Boroughs of Southwark and Lambeth, for implementation of physical activity and healthy lifestyle stimulation programmes. In recognition of the SESRC's growing involvement in translational research and partnerships with the health and sports sector, the Human Performance Centre (HPC) was established in 2008 as an integral part of the SESRC to provide a vehicle to transfer our research to the outside world. The HPC's *InnovateWell* programme provides society and industry with fast and efficient SESRC science-inspired solutions to sports performance and human health challenges.

Following a review of the research within the SESRC, and based upon our multi-disciplinary strengths, emphasis on technology-driven research and favourable location, a clear strategy for our future research direction and activity has been developed. In the next 5 years, our plan is to prioritise the following:

1. Grow the volume and vitality of the team by increasing the number of doctoral, post-doctoral and visiting researchers. This will be achieved through: (i) further matched-funded studentships with key partners (2 new studentships per year); (ii) broadening of the team base by recruiting early career researchers to work alongside the senior research staff; (iii) offering more research fellowships (e.g. through the EU's Marie Curie Actions scheme) and research sabbaticals.
2. Strengthen our international footprint through setting further strategic collaborations, nationally and internationally, in areas that reinforce our core strengths and themes. Our aim is for at least 2 research papers of international significance per staff per annum, leading to an increase in the number of staff returned in our next REF submission and increased rating of research outputs.
3. Increase research income from key funding bodies and in particular from organisations such as the UK Research Councils and the EU Commission, more specifically, from programmes where translational research and matched-funding of technological solutions to healthcare and sports performance problems is a priority (target: at least 2 EU grants, min £100,000 per annum).
4. Continue to develop industrial partnerships. Maintain collaborations with local enterprises (e.g. through KTP programmes) and enhance research links with international health and sports companies and organisations.
5. Further enhance our state-of-the-art facilities through direct investment in new equipment and increased collaborations, both within LSBU and externally, to access complementary facilities.
6. Enhance the Centre's reputation for high quality fundamental and applied research through dissemination of SESRC achievements to scientific audiences, public and industrial communities (2 presentations per staff per annum) and an enhanced impact evaluation system.

To achieve these aims we plan to further focus and consolidate our research into two key themes:

'Mind and Motion' theme: The work under this theme will be defined to focus on the interplay of mind and motion, the bidirectional link between thought and action. In particular, we will aim to investigate the implications that this coupling has for life sciences. Increasingly it is understood that the sensory experience of movement affects its quality and mediates cognitive, perceptual and emotional processes. Experts in fields such as psychology, movement science, cognitive neuroscience, and clinical and sport science will be involved in the projects. Research has so far been constricted within separate and distinct disciplines. We will aim to organically mould multidisciplinary teams to target the main research questions from a behaviour-led perspective.

'Body and Movement' theme: This theme will address the interplay of body and movement to enhance knowledge of the interaction between human physiology, biomechanics and exercise. We will aim to produce internationally excellent research by using and developing novel technologies and study designs, and implementing the research results in sport, community and clinical practices. We will seek funding to establish long-lasting international multi-centre research programmes to target challenges such as highly personalized exercise training and recovery in

elite athletes; sedentariness and obesity; and early markers of lifestyle disorders such as metabolic syndrome, type 2 diabetes and cardiovascular diseases.

c. People, including:

i. Staffing strategy and staff development

The Sport Science team has experienced considerable staff changes during the assessment period. Only two staff (**Mileva** and **Sumners**) of those submitted to RAE2008 remain with the SESRC. Both are returned in this submission. Although challenging, this has created an opportunity for a strategic approach to the recruitment of new staff and links to new collaborators with complementary skills and expertise.

The SESRC research team consists of 14 staff of whom 11 (9.4FTE) are returned within this submission. This represents an 83% increase compared to RAE2008 and a higher proportion of SESRC staff submitted (79% versus 60% in 2008). Those not returned (Hawkins, Hunter and Seeley) actively contribute to the SESRC outputs via their involvement in HPC activities. Thirteen SESRC staff hold a PhD, two of whom were supported by the SESRC to gain doctorates since 2008 (**James**, Hawkins). Research experience of SESRC staff ranges from early career researchers (**James**, **Szabo** and Hawkins) to newly recruited staff at professorial level (**Raab**, **Tulppo**). Professorial staff provide mentoring and strategic leadership in our main research themes and in facilitating research collaborations and bids to major funders, e.g. the EU Commission. Multi-disciplinary cross-faculty collaborations are also encouraged via LSBU's own Collaborative Research Network initiative.

The team also draws on additional expertise from Visiting Fellows. For example, leading experts in sport (Dr Dave Cook – Head taekwondo coach at the Norwegian Martial Arts Federation; Dr Karl Cooke - Head of Sports Science & Medicine at British swimming and former Sports Science Manager at Lawn Tennis Association) and clinical practice (Mr Matthew Solan, Consultant Orthopaedic Surgeon, Royal Surrey County Hospital), regularly contribute and interact with the Centre's resident researchers. This affiliation ensures alignment between SESRC research activities and current priorities and needs of sports practitioners and clinicians, and provides opportunities for developing joint research bids. The British Orthopaedic Foot and Ankle Society recently funded Solan, **Mileva** and **James** to conduct a research feasibility study into the use of enhanced proprioceptive inputs to develop interventions for strengthening intrinsic foot muscles.

We provide a supportive and flexible working environment, in which all research active staff can develop their careers. The majority of SESRC staff hold permanent academic positions. The Faculty and the Centre also maintain a body of fixed-term research appointments (**Arabadzhiev**, **James**, **Raab, Sumners**, **Tulppo**) to increase critical research mass and expertise. These appointments have significantly enhanced our international reputation and visibility. We have also supported opportunities for staff to undertake sabbaticals (e.g. Bowtell), career breaks (e.g. **Sumners,** 2011-2013) and to hold joint appointments (**Raab,** Institute of Psychology, German Sport University in Cologne and **Tulppo,** Occupational Health Centre 'Verve' in Oulu, Finland)**.**

The University is fully committed to the Concordat to Support the Career Development of Researchers. This is coordinated at a Faculty level and we work closely with the University's Central Research Support Office (CRS) to provide information and training events supporting our researchers' career development. The Faculty operates an annual appraisal system for all staff. Research staff are actively encouraged to initiate and engage in research and are set annually reviewed research targets through the appraisal process. During the review period four staff achieved promotions (Bowtell and **Mileva** to Readerships, **Sumners** to Senior Research Fellowship, **James** to Research Fellowship), reflecting the University's commitment to reward high quality research. Research active staff are invited to bid for support from the University's Research Opportunities Fund, designed to encourage new collaborations and explore new research ideas (**Allen,** Bowtell, **Mileva**). Staff are also encouraged to apply for infrastructure funding for small items of equipment via a Faculty-run scheme. Larger capital items are supported by the University's research capital infrastructure fund. The SESRC has benefited to the tune of £205k through these schemes over the review period. In all cases funding was awarded on a competitive basis against criteria aligned with the University's research objectives.

The University and SESRC are committed to promoting high ethical standards of research. Staff

and doctoral students' research projects are ethically scrutinised and approved by the University Research Ethics Committee (UREC). The SESRC researchers have representatives on the UREC and the Faculty Sub-Committee. **De Oliveira** is a member of the UREC reviewing panel and **Mileva** is the Chair of the Faculty REC and ESBE representative at UREC. They are responsible for ensuring ethical approval and monitoring of all SESRC research projects.

ii. Research students

The SESRC has maintained its research student numbers through a period of staff change. Staff have supervised 10 doctoral researchers registered at LSBU (8 full-time and 2 part-time; 1 co-supervised with LSBU UoA3). In the audit period there have been 6 PhD completions at LSBU, four of which have been fully or part-funded through industrial scholarships (e.g. Reckitt Benckiser and FitFlop, NHS). PhD completions reflect a temporary reduction compared to RAE2008 (12), and this has been addressed in our current strategy where, for example, we have recently entered into agreement with high-profile enterprise partners (McLaren Applied Technologies and FitFlop) to match-fund two new full-time PhD studentships.

Upon recruitment each student is assigned to a supervisory team consisting of at least two academic supervisors (a Director of Studies and a Second Supervisor). A third supervisor (e.g. from industry) is assigned if appropriate. The recruitment process is supported by the CRS office. The Faculty Research and Enterprise Committee monitors student progress at least 2 times per year, including an annual report and transfer report from MPhil to PhD. Registration and transfer are overseen by the University's Research Degrees Committee with the assistance of the CRS office. The Faculty supports doctoral students via a dedicated PhD administrator. Besides specific research training, students attend appropriate Masters modules, external courses and industrial secondments, and are required to complete key skills training as a condition of their progress. The latter was commended, along with the University's use of independent chairs for thesis examination, by the QAA in the University's 2010 audit.

SESRC PhD students occupy two dedicated fully equipped offices and share with staff a common room, facilitating informal meetings and research discussions. Quarterly student research forums provide opportunities for peer-mentoring and student interchange. The University's Staff Development Unit regularly runs doctoral supervisor training for inexperienced staff, and as a refresher for experienced supervisors. SESRC's PhD students also benefit from access to competitive Faculty funding for attendance on external subject-specific courses and relevant conferences, and for the purchase of small items of equipment and consumables.

In the REF2014 period the SESRC team has hosted a number of successful research internships in tandem with other UK universities (e.g. King's College London), European organisations (e.g. European Hydration Institute) and leading European universities (e,g, Maastricht University Netherlands, Tübingen University Germany) as well as with existing business partners (e.g. Actegy, CherryActive, The Altitude Centre). SESRC staff has a good track record in securing funding for student vacation scholarships from the Wellcome Trust, The Physiological Society, Nuffield Foundation, the local Inspire! and the EU's Erasmus programmes.

d. Income, infrastructure and facilities

SESRC has achieved its goal set in the RAE2008 strategy of attracting external awards and income to support its research. Since 2008 funding of over £1.6 million has been attracted from a variety of sources for collaborative research, consultancy and infrastructure development.

SESRC team has secured £606k from industrial and European research partner organizations. This includes £440k awarded for research into novel health promoting technologies, for example, from Fitflop and Actegy. The team was also a key partner (with 6 University and Industry partners) in a €320k collaborative research grant funded by the European Commission via the Lifelong Learning Programme 'Leonardo Da Vinci' to develop a digital game based on the Serious Sports technology to support sports coaching education. Significant funding has also been secured for collaborative research with the Altitude Centre to look into the potential benefits of hypoxia as a training stimulus and for work with a specialist food manufacturer to develop healthy low-salt and low-calorie foods for the Weightwatchers™ range (£213k). Further contract research with SMEs (e.g. CherryActive and Firefly) has resulted in additional income of £30k for research into nutritional

interventions. SESRC staff have also attracted £306k through a series of consultancies for SMEs, media, sports clubs and athletes. The University has invested a further £625k in research infrastructure through the research capital investment fund and the Faculty to enhance the SESRC's research capability.

SESRC research is conducted in 7 on-site dedicated laboratories. These include three new state-of-art facilities (Movement analysis, 230m^2, Elite Human Performance, and Perception-Motor Control) established as part of the £47 million development at the Southwark campus. These three new labs for performing high quality research are equipped with a Qualisys 8-camera 3D motion analysis system and 5 Kistler force platforms, a hypoxic chamber, telemetric EMG and kinematics systems. The other four laboratories devoted to research in Biomechanics, Human physiology, Biochemistry and Nutrition have been upgraded throughout the REF period to incorporate a range of specialist experimental techniques (e.g. Near-Infrared Spectroscopy; intramuscular EMG system; Laser Tissue Perfusion Monitoring and Imaging systems; Flow Mediated Dilation system; RX Daytona Clinical Chemistry analyser).

The University encourages internal partnerships and shared use of facilities through prioritising funding to collaborating cross-faculty LSBU research teams. As a result the SESRC has access to facilities such as an environmental chamber shared with Engineering (UoA15); 2m Footscan plate with Health (UoA3); Eye Tracker with an Electroencephalography system with Psychology (UoA4). We also have access to off-site facilities through collaborative arrangements with external research partners, for example, the largest altitude chamber in London at the National Tennis Centre and the respiratory medical facility at The Chest Unit, King's College Hospital. We also benefit from a well-established process of short-term equipment loan with our partner universities or clinical establishments (e.g. King's College London and Exeter University).

e. Collaboration or contribution to the discipline or research base

Exemplars of collaborations, interdisciplinary research and informing research/strategy

SESRC has successfully maintained and expanded its external research collaborations. In the past 5 years the team has been involved in productive partnerships with a number of research teams from the UK (e.g. King's College London and Imperial College London, Liverpool Hope University, Staffordshire University, Exeter University) and world-wide (e.g. Aspire Academy Qatar, Bulgarian Academy of Sciences, Cork University of Technology Ireland, German Sport University Cologne, King Abdulaziz University Saudi Arabia, Semmelveis University Budapest Hungary, University of Oulu Finland, Ural Federal University Russia, Western University London Ontario Canada).

SESRC collaborated with the scientists at the Lawn Tennis Association and the Altitude Centre to develop novel altitude training programmes to improve performance in high-intensity intermittent sports such as Rugby and Tennis. Funded by a KTP (£198k) the novel methodologies are now being applied across elite sports and prior to major tournaments, as the results demonstrated that altitude training can have a greater impact in intermittent than steady state sports.

Cardiorespiratory scientists at the SESRC have collaborated with King's College London and King's College Hospital and were awarded funding (£260k) to investigate the effects of technology developed at SESRC (Aerosure) in clinical populations with Chronic Obstructive Pulmonary Disease and Cystic Fibrosis. Preliminary results suggest that Aerosure can reduce dyspnoea and increase physical activity slowing disease progression and maintaining quality of life. Further funding is being sought to continue this work and develop further applications.

Supported by two Knowledge Connect grants (£30k), SESRC researchers investigated the effects of montmorency cherry juice (CherryActive) in promoting rapid functional recovery, and of a herbal drink containing yerba mate and guarana (SharpenUp) on cognitive function and metabolism after intense exercise. The studies demonstrated that by taking these neutraceuticals athletes and fitness enthusiasts can train harder and better due to enhanced muscle function recovery through reduced oxidative damage and inflammation. This work has attracted the interest of the scientific and athletic communities and impacted significantly on public awareness of the important role of "super-foods" for optimal sport performance and improved quality of life.

SESRC researchers completed two studies (£47k), in collaboration with the Health Faculty (UoA3), funded by Redbridge Primary Care Trust and ProActive London Partnerships to promote physical

activity and investigate the efficacy of exercise referral schemes. Further, in a doctoral research project, supported by Guy's and St Thomas' Charity, factors affecting exercise adherence and impact on quality of life in inactive adults or people with chronic conditions were investigated. The scientists established reduced health risk factors, significant health and energy improvements and client satisfaction immediately and 6 months after a 12 session programme. Recommendations were made for the design and implementation of improved health promotion strategies to update the National Quality Assurance Framework (DoH 2001) for Exercise Referral systems.

The team has further built a reputation for problem solving, socially- and commercially-focused approaches to research, leading to successful development of innovative technologies and solutions for health and sports sciences, industry and practice. Members of the team are the named inventors on 10 patents (Cook, **Mileva**, **Sumners**, **Tulppo**) filed by our business partners for a range of highly successful commercialised products (e.g. FitFlop sandals, Aerosure, Revitive IX-Circulation Booster, Polar).

Exemplars of leadership

Journal editorships and participation in editorial boards
Editor-in-Chief J Sport Psychol 2009-2012; Assoc. Editor and Editorial Board member Psychol Sport Exerc; Section Editor Int J Sport Exerc Psychol; Sci Advisory Board member J Sport Psychol **(Raab);** Editorial Board member Assistant Int J Sport Psychol and Psychol Sport Exerc. 2008-11 **(De Oliveira);** Assoc. Editor Frontiers in Clin. Transl. Physiol. 2010-present **(Tulppo)**.

Leadership and advisory roles in industry, learned societies or professional bodies
Vice-President Sci. Adv. Board for Sport Sci at German Ministry of Interior affairs; Managing Boards of Eur. (FEPSAC, 2011-present) and German (2013-present) Sport Psychology Councils **(Raab);** Invited referee Estonian Science Foundation 2010-present **(Tulppo);** Advisory Board Members of SkillsActive, Central YMCA, ProActive London **(**Bowtell, Hunter**)**; Expert scientists for Food and Drug and Therapeutic Goods Administrations, Advertising Standards Agency **(Mileva**, **Sumners);** reviewer for BBSRC applications 2009-2010 **(Mileva)**.

Invited talks and keynote presentations
Keynote speaker (9): ENYSSP Portugal 2009; Granada Spain 2010; Wingate Conference Israel 2011; Barcelona 2012; Germany 2012 **(Raab)**; Symp. Grundlagen Meth. 2013 Germany; World Phys Ther Meeting Amsterdam Holland 2011; 58th Amer. College Sport Med meeting Denver USA 2011; Sat Symp 13th ECSS Congress Estoril Portugal 2008 **(Tulppo)**. *Invited speakers (14):* Royal Holloway 2009; UCL 2011; German Sport Univ. 2011; German Assoc. Sport Psychol. 2011; Psychol Cluster Seminars at Univ. Newport Wales 2013; Oxford Brookes Univ. 2013 **(De Oliveira)**; Psychol. Seminar Glasgow Caledonian Univ. 2010 (**Allen**); Actegy Health Australia 2012 **(Mileva)**; Brit. School Osteopathy 2011; Brit. Soc. Ecol. Med. 2011; BASES workshop Exeter Univ. 2013 **(**Bowtell, **Mileva);** Drug Delivery to the Lung 2009 Edinburgh **(Sumners);** Governmental Department research and technology transfer events (DTi) 2009 and 2010 (**Sumners**).

Public engagements and media appearances
Royal Inst. Christmas Lectures 2011 **(**Cook**, James)**; Welcome Trust Big Bang Fair 2011 **(**Bowtell, Hunter, **Sumners);** Men's Health **(**Bowtell**, De Oliveira,** Hunter**);** Radio 4 **(Cunliffe,** Hunter**);** BBC News **(Mileva);** Elite FTS **(**Bowtell**);** Shine TV **(De Oliveira,** Hunter**);** The Guardian; The Independent (Hunter); Daily Mail (**Cunliffe**).

Honorary Fellowship and Awards
Visiting Academic Fellowships **(Mileva,** Exeter Univ.; **Raab,** Victoria Univ. Melbourne Australia; **Sumners,** King's College London; **Tulppo,** Univ. Western Ontario Canada**)**; Best paper award (Persuasion in groups) at Communication and Social Cognition Division, Nat. Communication Assoc. 2012 **(Raab)**.

Professional excellence
BASES Accredited physiologist **(**Hunter**)**; Registered nutritionist **–** British Nutrition Society **(Cunliffe);** Chartered sports psychologist – British Psychology Society **(Allen, De Oliveira)**.