Institution: Cardiff Metropolitan University
Unit of Assessment: A3 Allied Health Professions, Dentistry, Nursing and Pharmacy
a. Overview

This submission is from the Cardiff School of Health Sciences at Cardiff Metropolitan University. There are three established research groups in biomedical research, food safety and nutrition, and applied psychology, as well as other researchers working in the broadly defined allied health professions. Overall, our aim is to undertake internationally excellent applied research in order to improve human health and well-being. We seek to do this through the creation of new knowledge, or the new application of existing knowledge in order to establish and consolidate best practice amongst our collaborative partners (including the general public and specific health populations). Supported by a well-resourced infrastructure and highly qualified, experienced technicians, our research addresses a wide-ranging set of imperatives globally (through our collaboration with the World Health Organisation), across the European Union (through funding for multi-agency major projects to which we contribute), and nationally (through UK and devolved governmental policy drivers – for instance, the Higher Education Funding Council for Wales research policy objective and the Welsh Government's Key Sectors of Food and Farming and also Life Sciences, including health).

b. Research Strategy

In 2007 when the previous strategic plan for research in the Cardiff School of Health Sciences was adopted, the key priority was to build critical mass. Specific targets for improving research performance were linked to measurable increases in the numbers of: (i) research active staff, (ii) staff engaged on collaborative projects, (iii) staff making active contributions to subject associations, learned societies and professional bodies, and (iv) postgraduate research students. All of these were achieved and having established a bigger and stronger platform for research, the strategic vision during the present Research Excellence Framework (REF) cycle has been concerned with international excellence. Consistent with the underlying principle of the University's REF Strategy, the submission must, as a minimum requirement, be both highly credible and capable of enhancing the University's reputation in applied health sciences.

Building on submissions to the Research Assessment Exercise (RAE) in 1996 and 2001 in which there was an improvement in the proportion of nationally excellent research (from a rating of 2 to 3b), the results in 2008 showed continuation of a rising quality profile with 50% of outputs rated as being of at least international quality (15% rated internationally excellent or world-leading). To maintain this upward trajectory, and also consistent with the overall aim for the University, challenging minimum threshold criteria for submissions to the REF 2014 were implemented. The aspiration is that none of the material included is likely to be rated as lower than Two Star, and that there is strong evidence that at least half of the material is likely to be rated Three Star or better. This return therefore marks a significant shift of emphasis from capacity building to critical selectivity evidenced in the submission of 12 researchers whose work is judged to have reached the University minimum standard from an initial return of 28 who presented their work for selection.

In making a full contribution to accomplishing the University targets outlined in the *Strategic Plan 2012-2017*, the Cardiff School of Health Sciences is committed to the cross-cutting themes of internationalisation, partnership, social justice and sustainability – and are linked to the three main research groups within the school, but in different ways. The Centre for Food Safety and Nutrition includes senior researchers (**Fielding**, **Peters**, **Tatham** and previously **Griffith** – all Professors) and is concerned with food safety behaviour for the food manufacturing industry and for consumers. Based on a £3.9 million investment from the Welsh Government and the European Agricultural Fund for Rural Development, the Food Industry Centre has established regional partnerships that have resulted in 31 small and medium sized food manufacturing businesses benefitting directly from research from this group. In particular, there have been improvements to food production and food safety management systems as well as increased economic prosperity with £27 million of increased sales, over £540k saved as a result of improved waste reduction, and the creation and safeguarding of over 1,000 jobs (see the first of our Impact Case Studies). The

Centre for Biomedical Research also includes senior researchers (**Cooper**, **Erusalimsky** and **Jones** – all Professors). It conducts research on cellular senescence and vascular ageing, microbiology and Infection, vascular physiology, diabetes and metabolic health, and immunology. This work has attracted significant external funding (over £1.4 million since 2008), contributing to its sustainability. The research conducted by the Applied Psychology group (which includes **Alwyn**, **Sanders** and **Watt** – all Readers) has two main foci. The first is health psychology – for example, memory and concentration, healthy ageing, and substance misuse. The second is forensic psychology – for example, motivation to offend, alcohol related violence, and street robbery classification. Inspired by social conscience and citizenship, a distinctive feature of the group is the strong commitment to intervention study designs. There are also researchers working in the allied health professions including dental technology, environmental health, podiatry, and speech and language therapy.

Going forward, the primary strategic aim is to increase the volume of internationally excellent research and to raise further the quality of the best outputs. This will be achieved through a set of linked objectives to: (i) consolidate and extend the well-established research collaborations, and seek new ones that add value; (ii) extend the portfolio of research to embrace emerging areas and to establish them as research groups; (iii) develop robust and sustainable mechanisms to encourage and support research; (iv) increase grant capture for research initiatives that produce high-quality research outputs; (v) increase the number of postgraduate research degree candidates through sustainable and well-managed expansion; and (vi) continue to exploit impact beyond academia.

The key driver for each of these strategic emphases, and the main priority for the continued success of each existing research group, as well as the possible emergence of a critical mass for new ones, is collaboration. The forms of collaborative working vary in scale and scope from international multi-agency funded programmes of research to local inter- and trans-disciplinary projects built around the applied research interests of individuals.

Enabled by the University's European Projects Office, amongst **Erusalimsky's** portfolio of research themes have been two projects funded by the European Union (EU) Seventh Framework Programme. The first, involving 15 other Universities from nine European countries and worth a total of €499k, was entitled 'WhyWeAge – A road map for molecular biogerontology' (project number HEALTH-F4-2008-200970; 2008-2010). The second, 'Frailomic' (project number 305483), which began in early 2013, is the largest funded study on ageing, frailty and disability in the EU. Worth a total of €12 million, it is based on a consortium of five other Universities, two leading research centres, four hospital-based research groups, seven small and medium sized enterprises and the World Health Organisation (WHO). Research groups and/or individual researchers also have international links with many of the world-leading departments for their respective fields of study: MacQuarie University in Australia (**McDonnell**), Harvard University (**Evered**, **Perham**), the Institute for Exercise and Environmental Medicine in Dallas (**Pearson**), and the University of Buenos Aires (for which **Erusalimsky** and **Killick-Cole** secured Santander Scholarships).

National collaborative projects include the Welsh Government funded National Exercise Referral Scheme. Involving **McDonnell**, **Thomas** and **Webb**, it was developed to standardise exercise referral opportunities across all Local Authorities and University Health Boards in Wales. Lung Research Wales (**Jones**, and coordinated by Cardiff Metropolitan University) has an overall research portfolio worth £3.7 million funded by the National Institute for Social Care and Health Research (NISCHR).There has also been a £1.5 million Biomedical Research Award in partnership with Swansea University, also funded by NISCHR, to investigate biomarkers for determining blood coagulation abnormalities and screening in health and disease (**Morris**). Similar links exist with the National Offender Management Service (NOMS, **Bowes**), the Specialist Antimicrobial Chemotherapy Unit of Public Health Wales (**Jenkins**), South East Wales Academic Health Sciences Partnership (SEWAHSP, **Peters** and **Jones**), and the Welsh Heart Research Institute (**Morris**). Additionally, there are some individual links with prestigious research groups: Cardiff University (**Jones**, **Kelly**, **Morris**, **Webb**), Nottingham University (**Bowes**), the University of Cambridge (**McDonnell**) and University College London (**Erusalimsky**). Some of these

collaborations have become formal contractual relationships with the University (e.g., SEWAHSP, Cardiff and Vale University Health Board, Knowledge Economy Skills Scholarship and Prince of Wales Innovation Scheme), whilst others – both national and international – are based on Memoranda of Understanding (e.g., NOMS, Jomo Kenyatta University).

c. People, including:
I. Staffing strategy and staff development

The staff base to support research in the Cardiff School of Health Sciences has been reassuringly stable during the REF cycle. Since 2008 the number of new appointments that have been made has more than offset the departures and the net effect has strengthened the capacity for research excellence. This is also evidenced through: (i) a recruitment strategy that has emphasised recognised scholars and/or practitioners (**Bowes**, **Maddocks** and **McDonnell**); (ii) planned investment in early career and other researchers who show the potential for work of Three Star and Four Star quality (**Jenkins** and **Kelly**) as well as research staff funded internally (**Ahluwalia**, **Killick-Cole**, **Davies L** and **Redmond**) and externally (**Azzopardi**, **Butcher**, **Cardus**, **Hawkins** and **Hodgetts**); (iii) internal promotions to Reader (**Sanders**) and Professor (**Cooper** and **Fielding**) for senior researchers who have developed their research leadership; (iv) appointment of eminent researchers to senior roles as Emeritus Professors (**Griffith** and **O'Leary**), Honorary Professors (**Monaghan**, who joins **Badawy**, **Ball**, **Coleman**, **Davies B** and **Hannan** from the School), and Visiting Professors (**McMurran** and **Russell**); and (v) clear strategic drivers for replacing senior staff who have left the University (**Burton**, **Griffith**, **O'Leary** and **Wildsmith**). Together, the research culture is vibrant, forward-looking and outward-facing.

Senior researchers including the School's seven Professors and five Readers provide mentorship and guidance to colleagues to develop their academic careers and to ensure effective succession planning. Some of them have taken on major academic leadership roles (**Peters** is Dean of the School, **Fielding** is the School's Director of Research, and **Sanders** is the School's Graduate Studies Coordinator). Other researchers have also taken on research-related roles (**Jones** was the Human Tissue Authority 'Designated Individual' for the University under the terms of the Human Tissue Act, and has been replaced by **Peters**; **Harris**, **Thomas**, **Sanders** and **Thirlaway** have all served as Heads of Department).

Formal interactions are fostered by specialised seminar series (within each group and across all groups) with external and internal speakers (including Research Assistants and PhD students), regular research group meetings dedicated to discussion of research proposals, grant activity, and impact. A collegial approach is taken to mentoring that nurtures individualised, on-going support and guidance for research development from colleagues from cognate academic subject fields. All staff are individually reviewed annually based on their primary function but with research-related targets aligned to strategic goals that are agreed and later evaluated. We actively protect the research time of our academic staff by supporting, where possible, extended research leave for specific projects (**Walker** and **Webb** have outputs being returned in this submission and were beneficiaries during the present REF cycle, as was **Powell**), and through a rigorous workload allocation model into which research is factored. Research funding opportunities are made available, for example, through Research Innovation Awards for post-doctoral researchers (**Pearson**), Research and Enterprise Investment Fund (to support projects greater than £20k – **Jones/Sykes**, **Maddocks**, **Morris** and **Rushmere** have been beneficiaries), as well as a Seed Fund (for small projects of up to £2k designed to build collaboration), and an Impact Exploitation Fund. All staff and research students are funded to attend and present their work at international conferences (approximately £35k per year for research-related staff development).

The School participates in internal mock REF assessments and Impact Open Days. The University's Research and Enterprise Services unit provides support in the form of training and assistance in writing grant bids and information regarding funding opportunities, and administers an internal peer review process by members of the University's Professoriate for grant proposals to external funding agencies in excess of £25k. Further support in the form of continuing professional development is provided to research staff through an in-house programme of activities (e.g.,

research ethics, research degree supervision and examination, health and safety, and Human Tissue Act compliance). Career development for researchers is also supported through the implementation of the Concordat to Support the Career Development of Researchers and the Vitae Researcher Development Framework Planner which has been purchased by the School. **Fielding** is a member of Vitae's UK-wide Researcher Development Advisory Group, and a member of the Wales Network of the South West and Wales Vitae hub.

Embedded in Cardiff Metropolitan University's Strategic Framework is a commitment to all aspects of equity, diversity and social inclusion. There is an explicit intention to secure Athena SWAN bronze award, and an application is being prepared. This programme of work is being driven by the Cardiff School of Health Sciences, with the University Self-Assessment Team being chaired by **Peters** with other contributions from **Thirlaway** and **Butcher**.

The research activities of the Cardiff School of Health Sciences are also supported by a dedicated Research and Enterprise Office (the Research and Enterprise Support Manager is an active member of Association for Research Managers and Administrators), as well as a team of well-qualified technicians with particular expertise in flow cytometry, imaging, microbiology, molecular biology, spectrometry, and virology. The team leader is also the Human Tissue Authority 'Person Designate' for the School under the terms of the Human Tissue Act.

c. II. Research students

Following rapid growth in the number of full-time equivalent (FTE) research degree candidates during the period of the last RAE (from 22.3 in 2001 to 34.4 in 2007), there has been a continued upward trend in enrolment during the present REF cycle with the number of PhD students now stabilised at 48-50 FTEs per year. There is a four-part strategy in place to maintain the number of doctoral candidates. The first part is through competitive University funded studentships (which, since 2008, have been called Bursary Awards for Research Students, Vice-Chancellor's Doctoral Awards and Research Innovation Awards) – the School has secured eight. The second is through full or partial external funding of research degrees – there have been ten recipients. In some instances of partial external funding (for example, for Health and Social Care Studentships from the NISCHR and the Welsh Office for Research and Development), the School has committed to a matched funding arrangement. The third part is through short, fixed-term stipends from agencies including Cwm Taf Health Board, the Society for Applied Microbiology, the Society for General Microbiology, and the British Society for Antimicrobial Chemotherapy – there have been eleven recipients. The fourth is further evidence of the School's engagement with the University's internationalisation imperative and is the result of the proactive recruitment of overseas doctoral students. Supported by the University's International Office, employees of national governments have embarked on doctoral programmes of research from Oman and the United Arab Emirates, and scholars from the University of Fayoum (Egypt) have been funded by the EU's Flow-by-Flow EU-Egypt Bridge Building Project.

Formal interactions between PhD students and established researchers are fostered by the activities outlined in the staff section above. Researchers who embark on research degree supervision for the first time complete an induction programme before being eligible to join teams of supervisors. In close alignment with established good practice across the sector, and compliant with the QAA Code of Practice, they join supervisory teams with at least one other experienced supervisor which also maximises mentorship opportunities.

The success of our doctoral graduates is partly evidenced in their first employment destination. Linked to Professional Development Planning, the opportunities research students have to accumulate skills and competencies linked to employability are key aspects of their experience at the University and, in particular, in the Cardiff School of Health Sciences. Following an audit of skills needs, support is provided to research degree students at University level. Skills associated with an 'apprenticeship' as a researcher are developed corporately during the annual Skills Week programme through sessions including effective presentation and communication, thesis writing, viva preparation, interview skills, grant application workshops and specific training on research

methodologies (such as thematic analysis) and specific software (for example, SPSS and NVivo). Subject focused skills are developed at School level through a validated Research Skills module, developed in line with the Research Councils UK Joint Skills Statement. To equip research degree students for a career in Higher Education which includes learning and teaching, a Classroom Demonstrator Policy was introduced in 2008. The purpose was to formalise arrangements for combining learning and teaching activities with research degree programmes and to ensure that candidates were properly equipped for roles as tutors. In-house training in the form of a 'Teaching Toolkit' has proved successful and some PhD students have completed a Post-Graduate Certificate of Teaching in Higher Education alongside their doctoral studies.

For research degree candidates there is also an annual pan-University symposium which includes presentations by leading researchers, policy makers and practitioners as well as a poster presentation event. Research degree students receive support to attend internal and external training and international conferences, and are encouraged to present their work at the latter. The School has established a 'ring-fenced' fund to support this activity.

This provision of opportunities linked to employability means that graduating students are competitive when they apply for posts in the higher education sector. Some have secured lecturing positions (e.g., Swansea University – **Davies N**, the University of Strathclyde – **Wilkin**); others applied successfully for research posts (e.g., Nottingham University – **Fernandes** and **Roberts**, the University of Cambridge – **Uryga**). The market value of our graduates also extends to a variety of organisations outside higher education (e.g., Omani Ministry of Manpower – **Al-Sadqi**, Public Health Improvement Research Network – **Hawkins,** Shelter Wales – **Campbell**).

d. Income, infrastructure and facilities

The sum of research income over the period of the present REF is over £5 million and is derived primarily from four principal sources. The majority (over £3.3 million) is from UK Central Government bodies – in particular for the Knowledge, Innovation and Technology Exchange (KITE) programme concerned with the small and medium sized enterprises in the food industry in Wales, but also including the Food Standards Agency (**Griffith** – retired and **Redmond**), and NISCHR (**Clayton** and**Thirlaway)**. More than £1.3 million is from UK industry – mainly linked also to the KITE programme, other Knowledge Transfer Partnerships (at which the School has enjoyed a sustained period of success that pre-dates the start of the present REF), and a collaborative programme of research with a major pharmaceutical company (**Erusalimsky**) – there is a confidentiality agreement about this relationship. A combined total of over £206k was received from all UK-based charities (e.g., the Leverhulme Trust – **Sanders**, Tenovus – **Harris**, Sir Halley Stewart Trust – **Cooper,** and the, Waterloo Foundation – **Cooper** and **Mercer**); and almost £100k was also secured from Research Councils (British Academy – **Mayr** and **Sanders**, the Economic and Social Research Council – **Sellen**, and the Medical Research Council – **Erusalimsky**).

The research activities of the Cardiff School of Health Sciences have been supported by major capital investment. Opening in 2009 at a cost of £3.9 million, the Food Industry Centre is a dedicated research facility with laboratories in biomedical and food research. It also houses a Postgraduate Research Centre including offices for academic staff and seminar rooms. An Applied Psychology research facility was also opened in 2009 and a Health Assessment Suite was commissioned and opened in 2012 – at a combined cost of £250k. Together, these facilities marked a significant step in establishing the Cardiff School of Health Sciences on a single site with a first class environment for internationally excellent research.

Facilities to support biomedical research include the following: **Imaging** (i) Nikon Eclipse 80i Microscope (brightfield, DIC, epifluorescence, laser scanning confocal), (ii) Zeiss Axiovert CFL25 Inverted Microscope (brightfield, phase contrast, variable relief contrast, epifluorescence), (iii) Beckman Coulter FC500 MPL Dual Laser Flow Cytometer; **Tissue Culture** (i) four individual laboratories for Human-Derived Cells (blood, primary or stem cells) - Viral Work, Mycoplasma Free Cells, Quarantine Cells, (ii) Ruskinn SCI-tive Hypoxic Workstation, (iii) Casy Model TT Cell Counter and Analyser; **Molecular Biology Pre-Extraction** (i) QiaCube, (ii) NanoDrop ND1000

Spectrophotometer, (iii) Agilent Bioanalyser; **Post-Extraction** (i) Applied Biosystems 7500 Fast Real-Time PCR, (ii) Thermal Cyclers, (iii) Gel Electrophoresis Equipment, (iv) UVP Auto-Chemi Gel Doc system; **Microbiology** (i) Bioaerosol chamber, (ii) Biorad CFX96 Real-Time PCR and Gel Doc system, (iii) Anaerobic workstation, (iv) BMG Labtech SPECTROstar nano Plate reader; **Functional Food / Analytical Chemistry** (i) LC/MS (Agilent 1200SL Series LC and 6330XCT Ion-Trap), (ii) LC (Agilent 1200 Series and Multi-Wavelength Detector), (iii) Agilent 6890N GC and 5973N MS, (iv) Tecan Infinite 200 Plate Reader with Injection Module.

The Health Assessment Suite is also well equipped with a sphygmocor (to measure arterial stiffness), a Vivid Q (to measure vascular blood flow through the eye, kidney and heart), a transcranial Doppler (to measure the velocity of blood flow through the brain), a Cortex Metalyzer (to measure oxygen consumption and carry out 12 lead ECG testing), equipment to measure 24 hour central ambulatory blood pressure, vascular stiffness and body composition, and a Reflotron to measure 17 clinical parameters in blood, including liver function. These facilities enable us to perform physiological testing using pharmacological interventions.

The Food Industry Centre incorporates food processing facilities (high and low care bakery and confectionery pilot plant equipped with metal detection, food processing and texture analysis equipment), test and development kitchens, an observation kitchen equipped with cameras to record food handling behaviours for subsequent analysis, and a sensory evaluation suite (unique in the region) equipped with networked data input facilities and specialist software for data analysis.

The psychology research space includes specialist rooms for focus groups and interviewing, a Cognitive and Speech Science laboratory for testing small groups and an observation suite. There has also been substantial investment in specialist Psychology research equipment including Noldus video behavioural analysis software, Biopac Psychophysiology amplifiers and software, and fixed and mobile eye-tracking equipment and software. We also offer in-house bilingual clinics which utilise the Cognitive and Speech Science laboratory with a sound attenuated booth.

In combination, these facilities and the equipment in them have contributed to the production of research that has led to impact outside academia (including the underpinning research for the Impact Case Studies), as well as the outputs being returned in this submission, and other emerging areas of research activity. In addition to direct income, the School has also received benefits ‘in kind’ that resulted from on-going research partnerships. The same major pharmaceutical company noted in section d. (above) is funding in full the patent application (US 20110111966 A1) on behalf of **Erusalimsky** and **Ahluwalia**. **Cooper** has been supported by industrial partners to present her work at numerous international conferences. The Food Industry Centre is sponsored by Lock (Metal Detection Systems) and receives consumables from Holchem. A 3D scanner was donated by Renishaw, and the equipment in the in new Health Assessment Suite was donated as a result of the collaboration with Cardiff University and the University of Cambridge on health MOTs.

As well as routine replacement, refurbishment and renewal of equipment, there has been recent investment in the purchase of new items: Real-Time PCR systems (£50k), Accuri C6 flow cytometer (£32k), Agilent 1200SL HPLC (£30k), Cortex Metabolic System (£26k), and microscopes (£12k). With further investment over the REF cycle of £263k on a School-based Research and Enterprise Office, £258k on purchases for Postgraduate Research Students, and £300k on maintaining the research infrastructure, the research activities of the School are well resourced.

e. Collaboration and contribution to the discipline or research base

Researchers from the Cardiff School of Health Sciences make a significant contribution to the disciplines, sub-disciplines and subject fields that they represent. In turn, these add value to the research culture within the School and across the University as a whole.

During the REF cycle there has been extensive involvement in Editorial Board activities across some sector-leading journals in different roles. They include:

(i) Editor in Chief (or equivalent): *Prosthetics and Orthotics* and *The Foot and Ankle Online Journal* (both **Curran**), *Wounds UK* and *Journal of Wound Care* (both **Cooper**).
(ii) Associate Editor: *World Research Journal of Cardiology* (**Morris**).
(iii) Editorial Boards / Editorial Advisory Board members: *Advances in Medicine* (**Erusalimsky** and **Morris**), *British Food Journal* (**Fairchild**), *British Journal of Podiatry* (**Curran**), *Food and Function* (**Tatham**), *Gerontology* (**Erusalimsky**), *International Journal Consumer Studies* (**Fairchild**), *International Journal of Dairy Technology* (**Kanekanian**), *International Journal of Podiatric Biomechanics* (**Curran**), *Internet Journal of Biological Anthropology* (**Curran**), *Journal of Food Biosciences and Technology* (**Kanekanian**), *Journal of Nutritional Health and Food Science* (**Tatham**), *Journal of Substance Use* (**Alwyn**), *Open Allergy Journal* (**Jones**), and *The Food Journal* (**Kanekanian**).

The strategic direction of subject associations, professional organisations and government agencies has also been influenced by representation from the Cardiff School of Health Sciences. Some researchers hold executive roles: Royal Society of Chemistry Food group (Chair – **Tatham**) and the Society for Applied Microbiology (**Fielding**). Other activities reflect the scope of the research in the School: Alcohol Research UK (**Alwyn**), Argentinian Ministry of Science Advisory Committee (**Erusalimsky**), British Psychological Society Division of Forensic Psychology (**Bowes**), Creating an Active Wales (**Webb**), Diabetes Research Network (**Thomas** and **Webb**), 'Food for Wales, Food from Wales' Strategy Consultation (**Lloyd**), Health Research Network (**Sellen**), NISCHR Fellowship Grant Committee (**Jones**), Older People and Ageing Research Network Development Group (**Clayton**), Public Health Improvement Research Network (**Thirlaway**), Welsh Centre for Crime and Social Justice (**Watt**); Welsh Food Advisory Committee (**Fielding**), Welsh Speech and Language Therapy Committee (**Mayr**), General Dental Council Assessment Panel (**Williams**), and National Science Advisory Group for Diabetes (**Thirlaway**).

Keynote presentations and invited lectures have been delivered at conferences and elsewhere. These include: American Society for Neural Transplantation and Repair (2011 – **Kelly**), Association for Organics Recycling (2009 to 2013 – **Sykes)**, BIT'S Second Annual World Congress of Food Science and Technology (2013 – **Fielding** and **Lloyd**), Canadian Federation of Podiatric Medicine Annual Conference (2010 – **Curran**), International Association for Food Protection (2009 – **Griffith**), 11th International Scientific Conference (2012 – **Williams**), IXth World Conference on Clinical Pharmacology and Therapeutics (2008 – **Erusalimsky**), Telomere Biology in Health and Disease Conference (2011 – **Erusalimsky**), Wales Physical Activity, Diabetes and Metabolic Health Research Group Conference (2008 – **McDonnell**), Welsh Severe Asthma Group (2013 – **Jones**), World Congress on Biotechnology (2011 to 2013 – **Kanekanian**).

As well as hosting the WHO Collaborating Centre for the Public Health Management of Chemical Incidents, the Cardiff School of Health Sciences has been involved in staging research conferences – some are international (e.g., Atlantic Regions' Coastal Pollution Response Plus, a joint venture with Public Health England, Public Health Wales, G7+Mexico and the WHO), others are more UK based but often with a practitioner focus (Food Network Wales Conference, Welsh Diabetes Society Research Conference).

Other indicators of research-related contribution amongst health science researchers include international consultancy appointments: United Nations Food and Agriculture Organisation (**Fielding**), USAID on developing Food Science and Technology Education in Armenia (**Kanekanian**), WHO laboratory testing in South East Asia (**Morris**). **Morris** has also been a grant assessor for the Medical Research Council as well as Heart UK, Diabetes UK, NISCHR, and the Wellcome Trust. Researchers from the School are also sought after as External Examiners for doctoral candidates at prestigious Universities in the UK and overseas – for example, at Cardiff University, Nottingham University, Reading University, University of Sheffield Dental School, University of Sussex, Waikato University, Universidad Autonoma de Madrid, the University of Cambridge and University College London. Senior researchers have also been invited to contribute to Appointments Committees for Professorial and Readership candidates at Cardiff University, Swansea University, St. George's – University of London, and the University of Wolverhampton.