

<p>Institution: University College London</p>
<p>Unit of Assessment: 3A - Allied Health Professions, Dentistry, Nursing and Pharmacy: Dentistry</p>
<p>a. Context</p> <p>UCL's submission to UoA3 comes from its Eastman Dental Institute (EDI), located within the Faculty of Medical Sciences and Dental Public Health (DPH) in the Faculty of Population Health Sciences. A wide spectrum of non-academic research users - including national and international health policy makers, industry bodies, oral health care providers and patients - benefit from our research. Those benefits arise primarily via its impacts on industry standards and services; healthcare policy and practice (and subsequently on the quality of patient experience); and public awareness of and engagement with important oral health issues. More specifically, our transfer to these key user groups of specialist knowledge and expertise in social inequalities, microbiology, biomaterials, clinical research allied to oral health, and the delivery of clinically-related education has resulted in significant impacts on:</p> <ul style="list-style-type: none"> ● NICE guidelines and subsequent clinical practice ● National public health surveys and public inquiries ● Research-driven clinical practice among both national and international health care providers ● Industries focused on improving health through the provision of new therapies ● Research-informed clinical care ● Patient care via the commercialisation of research outcomes) ● Industry standards through research and training collaborations <p>We also share key research findings with the broadest public audiences through a range of activities to enhance public understanding of the importance of oral health to systemic wellbeing.</p> <p>b. Approach to impact</p> <p>The transfer of our specialist knowledge and expertise to non-academic user groups is central to our approach to impacts. The culture of engagement with all potential users is promoted via regular meetings of all staff to: i. identify areas of potential impact; ii. promote a shared understanding of research foci that will benefit patients and the public and inform policy makers; and iii. develop mechanisms to engage and communicate our expertise to the public, patients and industry. Specific approaches to delivering benefits to our key research user groups include the following.</p> <p>i. Transfer of research expertise and knowledge to public policy makers in order to maximise the societal benefit of our research outcomes and expertise. In the UK, Watt is a core member of the NICE Oral Health Advisory Group; he contributed to the development of the Department of Health (DoH) 2009 NHS Adult Dental Health Survey (ADHS), the 2013 Child Dental Health Survey of England (with Tsakos), and is an invited expert on the development of the DoH Delivering Better Oral Health. Since 2007 Watt has chaired the DoH working group for Smokefree and Smiling Guidelines, and has been appointed academic lead for the DoH Commissioning better Oral Health group. Porter was an appointed member of the recent Independent Inquiry into dental services in Belfast commissioned by the Northern Ireland Government and is a member of the NICE Drug Information Group. Internationally, Watt and Tsakos were appointed as founding members of the WHO Global Network on Oral Health Inequalities group.</p> <p>ii. Commercialisation and collaboration with industry. We have fostered and sustained productive working relationships with commercial organisations to deliver collaborative and/or commissioned research through the licensing to industry of several of our patents. This approach has involved our use of support offered by UCL's Technology Transfer Office (UCLB) and Translational Research Office (TRO). Since 2008 we have made 11 licensing agreements for our IP with industry; for example, aside from work by Wilson (the impacts of which are described in UCL03-WIL), Knowles' work on high strength ceramics was patented [text removed for publication] in 2002, leading to CE marking and its commercial availability for clinical use from 2009. The patented work of Young on antimicrobial restorative materials is underpinned by a longstanding collaboration [text removed for publication]. We also engage with industry via our provision of commissioned research. Recent examples include projects funded by: Pfizer (Donos); GSK (Spratt); Ovalgen DC (McDonald); Philips (Donos); Optident UK (Brett); L'Oreal (Bozec); and Dyson (Knowles and Donos). We have used support offered by UCL's consultancy contracting office (UCLC) to enable staff to hold consultancy contracts with companies including</p>

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iii. Training and CPD with industry. We maximise opportunities to transfer knowledge and expertise to industry through research training collaborations which presently include studentships with GSK, Johnson and Johnson, Proctor and Gamble and the International SAE Consortium Ltd, and through the development and delivery of collaborative training for clinicians. Since 2010, for example, **Donos** and **Mardas** have delivered specialist training with the International Team for Implantology to 60 trainees from around the globe. A 2013 collaboration with Carl Zeiss, meanwhile, provided training in microscopy to 90 dentists from across Europe. Since 2008 we have delivered well received, research-informed clinical training to 100+ UK clinicians of Integrated Dental Holdings. Our longstanding collaboration with the British Dental Journal in the provision of research-led CPD reaches over 16,000 users. Since 2010 staff (**Donos, Fedele, Hopper, McDonald** and **Porter**) have worked with the Dental Defence Union (DDU) to deliver joint programmes on medicolegal risks of dentistry. In collaboration with the British Dental Association (BDA) we also deliver annual careers days, routinely attracting in excess of 1000 UK participants.

iv. Engaging health care providers. Our approach to cultivating and maintaining significant engagement with national and international networks of dentists includes our delivery of both local and on-line (e.g. "DCP bites" (<https://www.dcpbites.com>) CPD training (outwith credit bearing teaching) for 300 dentists and 50 dental care professionals (DCPs). We have also sought to sustain existing relationships with oral healthcare providers and promote the development of new ones through a series of PR exercises with EKC communications, and through the establishment of a regular journal column by **Porter** in "Dentistry". Our leadership of, and contributions to numerous national and international specialist societies provide focus/change in research-allied clinical care: thus, for example, work by **Cunningham** led to the inclusion of psychological assessment in British Orthodontic Society guidelines on orthognathic care.

v. Working with patients and patient groups. Engagement with patients is promoted by the establishment of patient and public involvement groups that ensure that patient/carer experiences and expectations are recognised and responded to in our research on: periodontitis (**Donos**); radiotherapy (**Fedele, Porter**); Sjogren's Syndrome (**Fedele, Porter**); tooth wear (**Rodriguez**); craniofacial anomalies (**Cunningham**); and childhood caries (**Ashley**). Additionally, staff share expertise and advice based on their research via keynote lectures to patient groups such as the British Sjogren's Syndrome Association (**Fedele**) and Charities including Chai Cancer Care (**Porter**). Our efforts to extend reach of our impacts on public awareness of and engagement with our research itself and important health issues relating to it have included the development of oral health public information resources. Notable examples include **Porter's** development of on-line information leaflets for the UK Raynaud's and Scleroderma Society and UK National Kidney Federation, and patient and family-oriented DVDs for the Ehlers Danlos Support group.

vi. Engagement with the public. Supported by the UCL Public Engagement Unit we have taken a multiform approach to delivering benefits to a wide public audience. Examples include: (i) joint public engagement exhibitions, including with the Wellcome Trust ("Co-existence", 2010 & "Microbes and Me" 2011, **Wilson**), Science Museum ("Me in 3D", 2012, **Hunt, Shah**); Cheltenham Science (**Wilson**, 2011) and Bloomsbury Festivals (**Spratt**, 2011, 2013); (ii) school-based presentations (e.g. "Biology4all" London and Kent 2008, 2011, **Allan**; Orthodontics, London and Wiltshire, 2013, **Cunningham**); (iii) our establishment in 2010 of an e-zine (Eastman 360) hosted on our website; and (iv) our prizewinning blog (UCL Research Frontiers Award) on BRONJ (4332+ views from 69 countries in last 20 months). Using the support offered by the UCL Media Relations office we contribute regularly to news media as, for example, in **Needleman's** engagement with the BBC and with both on-line (e.g. Huffington Post) and print (e.g. Daily Mail) press on the oral health of Olympic athletes, and **Nair's** 2013 work on functional foods with Channel 4.

c. Strategy and plans

Over the coming years, and allied to our research plans, we will build on our current area of strength in realising research impact to enhance our knowledge transfer, enterprise and engagement with the public, patients and policy makers. To that end, we plan to further embed and enhance the impact 'culture' and organisation within the UoA, particularly through:

i. Establishment of an "Impact group" to increase and improve communication of our research expertise to non-academic audiences. The group will comprise academic staff

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champions of and leaders in impact (names in bold in paragraphs below), who will advance the impacts of defined research areas by promoting engagement with specific stakeholders, mentoring staff and coordinating of the collation and sharing of relevant information.

ii. Enhanced engagement with key beneficiaries of our research. Deeper and broader engagement with policy makers will be promoted by **Watt** and **Tsakos**. They will maintain – and where possible increase - current levels of communication and collaboration with policy makers and clinical commissioning groups at local (e.g. PCTs), national (DoH) and international (EU, WHO) levels, and communicate opportunities for engagement with our staff. **Knowles, Young, Allan** and **Donos** will work with UCLB to lead increased engagement with industry. We plan, initially, to target the commercialisation of patents likely to be licensed in the next 18 months, but also to develop further collaborations with relevant industrial organisations such as [text removed for publication]. Our Patient and Public Engagement will be led by **Needleman** who will work with the PPI team at UCLHT to drive greater patient and public engagement in research by expanding the establishment of PPI groups across all clinical specialties of UCLHT Eastman Dental Hospital and ensuring the inclusion of impact outcomes on UCLHT web sites as well as that of EDI.

iii Embed impact in the faculty's culture and activities by (a) including impact in induction processes for academics and PGRs; (b) recognising involvement in impact activities as part of annual appraisals, pay reviews and promotion procedures; (c) revising annual job plans for all staff to enhance and/or support impact/engagement activities; (d) developing an intranet that provides information about and best practice examples of impact-generating activity, and that celebrates current projects and past successes; (e) including impact as a standing item on the agenda of termly staff meetings. We also plan to request participation in our monthly research meetings by UCLB, UCL Advances, our centre for entrepreneurship, and UCL Consultants Ltd, our consultancy contracting office. These initiatives will be led by **Porter** and **Donos**.

iv. Expansion of research-based continued professional development for health care providers. Engagement with health care providers will be enhanced by a review led by **Louca** (Head of CPD) of the needs of present and past users, which will be used to inform the development of new programmes. We will make more and fuller use of appropriate information technologies to maximise national and international opportunities, following the lead recently set by the secondment of **Eder** as associate Vice-Provost (Enterprise) to establish electronic delivery of CPD across UCL. We intend to use strategic alliances with social enterprises to deliver wider public and professional access to such resources.

v. Optimise engagement with the public via the redevelopment and expansion of our website to incorporate user-friendly details of the potential and actual impact of our research and video interviews with researchers and research beneficiaries, including patients. Our Twitter account will be similarly expanded to provide succinct summaries of the health benefits of our research, supported by the expansion of our local e-communications officer's role. Finally, we also plan to develop new blogs addressing contemporary oral health care issues; a start has been made here by securing funding from UCL Public Engagement Unit for a peri-implantitis blog (**Donos, Spratt**).

d. Relationship to case studies

The submitted case studies provide prime examples of the ways in which we engage with and provide benefit to user groups, including through many of the activities outlined above.

Light-activated antimicrobial agents (UCL03-WIL) describes benefits arising from **our use of UCL services to engage with industry to commercialise basic science findings**. This resulted in the development and clinical uptake of a new therapy that improves the health and wellbeing of individuals with periodontitis. *Antibiotic prophylaxis* (UCL03-SPR) illustrates how our research has challenged current knowledge and **influenced the establishment by NHS policy makers of national care guidelines** that have produced a reduction in the costs of patient care together with a lowering of risk of adverse side effects of therapy. *Epidemiology and quality of life* (UCL03-TSA) and *Oral health inequality* (UCL03-WAT) highlight further examples of our **engagement with local, national and international policy makers to inform and influence national health care planning policy**. Here, our research supported improvements in the quality of oral health care delivery in London and challenges to the political agenda for oral health in the UK and Europe.