

Dr Will Palin BMedSc MPhil PhD FADM

Reader in Biomaterials

[School of Dentistry \(/schools/dentistry/index.aspx\)](/schools/dentistry/index.aspx)

Contact details

Telephone [+44 \(0\) 121 466 5547](tel:+441214665547) (tel:[+44 121 466 5547](tel:+441214665547))

Email w.m.palin@bham.ac.uk (mailto:w.m.palin@bham.ac.uk)

The School of Dentistry
College of Medical and Dental Sciences
University of Birmingham
St Chad's Queensway
Birmingham
B4 6NN
United Kingdom



About

Will Palin is a Reader in Biomaterials at the School of Dentistry. His main area of research into photocurable materials used for both dental and wider biomaterial applications, has attracted grant funding from the Engineering and Physical Sciences Research Council and National Institute for Health Research and industry.

Qualifications

- PhD Biomaterials 2004: "The development of a novel dental composite material as a substitute for amalgam".
- MPhil Biomaterials 2001: "The mechanical and microscopic properties of a hydrothermal dental ceramic".
- BMedSc (Biomedical Materials Science) 1998.

Biography

Will Palin qualified with a BMedSc (hons) in Biomedical Materials Science from the University of Birmingham in 1998 and went on to study an MPhil and PhD in Biomaterials. Following a short research appointment at the University of Minnesota, USA, he was appointed as a Lecturer in Biomaterials in 2004 and subsequently promoted to Senior Lecturer in 2008 and Reader in 2013.

Since his PhD, Will has focussed his research principally in dental materials science, although he has recently identified the translational potential of his work in other fields such as, orthopaedic biomaterials. He is fortunate to work in a multi-disciplinary research area, where molecular and cell biology help to understand the interaction of materials within the biological system, which underlines the importance of an interdisciplinary approach (to both teaching and research) at the materials science-biological interface.

Will has been a committee member of the Association of Basic Science Teaching in Dentistry since 2009 and promotes innovations in teaching to help students better understand the importance of materials science in dentistry.

Teaching

- Head of the Bachelor of Dental Sciences (BDS) Biomaterials teaching speciality
- Development of innovative and progressive teaching and assessment structure
- Teaching and assessment for BDS, BMedSc, Dental Therapy courses
- BDS/BMedSc/DT curriculum review

Postgraduate supervision

Current research themes for PG supervision include:

Materials chemistry

- Investigating polymerization efficiencies of photoactive biomaterials.
- Improving photoinitiator systems for dental and novel medical applications.

Mechanical properties of biomaterials

- Mechanical response and fatigue of resin composites.
- Characteristics of bulk resin-ceramic hybrid materials.
- Reliability statistics for brittle materials.

Materials science-biological interface

- Effects of anti-bacterial additives on polymerization kinetics and cellular behaviour.
- Wavelength/irradiance effects on photoinitiator efficiency and cellular behaviour.

Research

Since my appointment to Lecturer in 2004, Senior Lecturer in 2008 and Reader in August 2013, I have built a team that focus on research of advanced polymers for dental biomaterials applications and more recently having success in attracting significant translational funding for development of novel medical technologies and advanced polymer composites for a wider area of biomaterial use. I have led the vast majority of successful funding applications as Principal Investigator and through that funding forged important collaborations both internally, across the UK, Europe and worldwide to provide unique interdisciplinary research groups in related fields with biological research, innovative materials characterisation techniques and bespoke applied sciences that underpin current and future biomaterial technology developments. Our significant field of research and collaborations are described:

Photochemistry

Understanding the complex mechanisms of using light energy for spatial and temporal control of polymerisation reactions. EPSRC funding (EP/E026257/1) for collaborative work with the National Physical Laboratory (NPL, London) led to the development of bespoke equipment (Dynacure™) for measurements of optical and physical properties of light-curable resins. Fundamental aspects of photoinitiator systems have been extensively studied to further understand and improve polymerization efficiency and we have productive collaborations at UCL, Louvain, Belgium, The Photonics Institute, University of Manchester and Oregon Health and Science University, Portland, OR, USA to assist and develop these goals.

Applied Biomedical Materials Science

Over recent years, we have developed a strong research theme at the materials science-biological interface, which has become internationally recognised and funded to underpin the growth of the mechanical characterisation and optical analytical laboratories within the Biomaterials Unit for the development of dental biomaterials (EPSRC and industrial sponsorship) and translational income for the development of orthopaedic biomaterials (NIHR, BBSRC). The funding has helped to promote a greater understanding of material behaviour, and realise improved chemistries for potentially more effective and reliable biomedical applications. We have used research funds to study mechanical response and fatigue of polymer composites, development of nano-particulate composites and characterisation of bulk resin-ceramic hybrid materials for dental and orthopaedic application.

Applied Biophotonics

We have developed an exciting new area of research that uses specific expertise in the physics of light and photochemistry to establish a working biophotonics group, which studies spectral biophotomodulation of dental tissue, that is, the use of light energy to promote accelerated tissue healing, pain-relief and biomineralization. This is a relatively untapped science within dentistry and has tremendous translational potential for other healthcare applications. At this early stage, we have already attracted substantial funding (NIHR), generated novel IP and established industrial sponsorship to take this forward.

Other activities

Other posts

- 2009-11: Adjunct Senior Lecturer in Dental Materials Science, James Cook University, School of Medicine and Dentistry, Cairns, Queensland, Australia.
- External Examiner for BDS Part 3; Kings College London, 2014-19

Consultancy

- 2008- : Betts Metals Group (Charles Booth), Birmingham. Technical advice for the use of metal alloys in dentistry.

Editorial

- Subject Editor for Biomaterials Adhesion, International Journal of Adhesion and Adhesives

Editorial Boards

- Dental Materials
- Journal of Dentistry
- Journal of Biomaterial Applications

Awards

- Paffenbarger Award, Academy of Dental Materials, 2009. "Photoinitiator type and applicability of exposure reciprocity law in filled and unfilled photoactive resins". J LePrince, M Hadis, AC Shortall, JL Ferracane, J Devaux, G Leloup, WM Palin
- Heraeus Kulzer Award for innovation in materials testing, International Association for Dental Research, Barcelona, 2010. "Competitive light absorbers in curing photoactive resins". M Hadis, AC Shortall, WM Palin

Local, National and International Citizenship

- Fellowship of the Academy of Dental Materials (FADM); October 2013
- Committee member of the British Standards Institute and International Organisation for Standardisation for Dental Restorative and Orthodontic Materials (CH/106/1) and Prosthodontic Materials (CH/106/2) since 2011.
- Serving member of the Guidance Panel for the Funds for Scientific Research (FRNS, Brussels, Belgium)
- Knowledge Transfer Network Development Panel for Dental Technologies (2013-4)
- Chair of the Organising Committee for the European Dental Materials Conference, 2013
- Secretary of UK Dental Materials Group; 2008-11
- School of Dentistry Strategic Research Committee
- Health and Safety Advisory Group Committee (Laser Safety Officer for the School of Dentistry)
- College of Medical and Dental Sciences (MDS) eLearning Committee
- College of MDS Alumni Impact Fund Panel
- College of MDS Business Engagement Strategic Panel
- Prima Facie Panel member for primary appeals across the University of Birmingham

Knowledge Exchange

- Delivery of continued professional development programs
- Expert consultancy to industry
- Development of curricula for external clients
- Active public-patient involvement in research

Publications

Nicolae LC, Shelton RM, Cooper PR, Martin RA, Palin WM (2014). The effect of Bioglass addition on mechanical and physical properties of photoactive UDMA-TEGDMA resin composites. *Key Engineering Materials*, 587: 215-221.

Shortall A, El-Mahy W, Stewardson D, Addison O, Palin W (2013). Initial fracture resistance and curing temperature rise of ten contemporary resin-based composites with increasing radiant exposure. *Journal of Dentistry*, 41: 455-463.

Finan L, Palin WM, Moskwa N, McGinley EL, Fleming GJP (2013). The influence of irradiation potential on the degree of conversion and mechanical properties of two bulk-fill flowable RBC base materials. *Dental Materials*, 29: 906-912.

Leprince JG, Palin WM, Hadis MA, Devaux J, Leloup G (2013). Progress in dimethacrylate-based dental composite technology and curing efficiency. *Dental Materials*, 29: 139-156.

Hadis MA, Shortall AC, Palin WM (2012). Specimen aspect ratio and light transmission in photoactive dental resins. *Dental Materials*, 28: 1154-1161.

Holder MJ, Milward MR, Palin WM, Hadis MA, Cooper PR (2012). Effects of Red Light-emitting Diode Irradiation on Dental Pulp Cells. *Journal of Dental Research*, 91: 961-966.

Hadis M, Shortall AC, Palin WM. Competitive light absorbers in photoactive dental resin-based materials (2012). *Dental Materials*, 28: 831-841.

Everson P, Addison O, Palin WM, Burke FJT (2012). Improved bonding of zirconia substructures to resin using a "glaze-on" technique. *Journal of Dentistry*, 40: 347-351.

Shortall AC, Palin WM, Jacquot B, Pelissier B (2012). Advances in Light-Curing Units: Four Generations of LED Lights and Clinical Implications for Optimizing their Use: Part 2. From Present to Future. *Dental Update*, 39: 13-22.

Palin WM, Shortall AC (2012). Filling the gaps. *Materials World*, 20: 26-28.

Jacquot B, Pelissier B, Palin WM, Shortall AC (2011). Three Generations of LED Lights and Clinical Implications for Optimizing their Use. Part 1: From Past to Present. *Dental Update*, 38: 660-670.

Hadis M, Leprince JG, Shortall AC, Devaux J, Leloup G, Palin WM (2011). High irradiance curing and anomalies of exposure reciprocity law in resin-based materials. *Journal of Dentistry*, 39: 549-557.

Burke FJT, Crisp RJ, James A, Mackenzie L, Pal A, Sands P, Thompson O, Palin WM (2011). Two-year clinical evaluation of a low-shrink resin composite material in UK general dental practices. *Dental Materials*, 27: 622-630.

[Privacy](#) | [Legal](#) | [Cookies and cookie policy](#) | [Accessibility](#) | [Site map](#) | [Website feedback](#) | [Charitable information](#)

© University of Birmingham 2015

