

Research Profile

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SUMMARY OF MY RELEVANT RESEARCH AREAS:

Brief summary of your research areas, in English *just a short paragraph please*

Biomimetic design of multifunctional materials to prevent bone infections. Cell/bacteria-material interactions and effect of biomaterial surface chemistry, topography and mechanical stimuli on bacterial adhesion and biofilm formation.

Brief summary of your research areas, in Chinese *we will translate this for non-Chinese speaking UK participants*

Primary Research interests: *A fuller description of your main research areas.*

I am an active member of the Biomaterials research community with a great interest in medical device associated infections. My research profile lies at the interface of biomaterial science, engineering and life sciences. I am particularly interested in the biomimetic design of multifunctional materials for relevant clinical applications, e.g. in the context of engineering and testing non-fouling/antimicrobial materials to prevent bone infections. Through patterning at the sub-micron level and the incorporation of antimicrobial agents, a combined physical and chemical strategy is harnessed for the preparation of medical device surfaces that prevent microbial colonisation without affecting cell adhesion and viability. Enhanced pre-clinical simulation and therefore testing under relevant *in vivo* mimicking conditions informs the design and manufacturing of new materials.

Topics in which you would like to develop collaborative research:

Please indicate here research areas for which you would like to find partners to undertake joint research.

I am keen to find partners in the following areas:

- Novel antimicrobials and their incorporation into polymers in a continuous process
- Functional coatings development and characterisation
- *In vitro* testing and animal studies

Relevant existing collaborations (academic/clinical/commercial) inside or outside China.

Include here any relevant collaborations you have

Polymer IRC; EU COST Action TD 1305; Improved Protection of Medical Devices Against Infection (IPROMEDA); Prof Peter Giannoudis, Professor and Chairman within Academic Department of Trauma and Orthopaedic Surgery, Leeds General Infirmary; Dr Alan Horner, Smith & Nephew

Relevant graphics, figures, pictures:

Use this area to show pictures or scientific figures which illustrate your research

- Biomimetic design of multifunctional materials with potential applications in medical implants, regenerative medicine and infection control



Co-extrusion



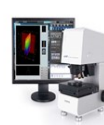
Micro-injection Moulding

- Materials Characterisation: physical, chemical, mechanical

SEM



CLSM



D_CAM



AFM



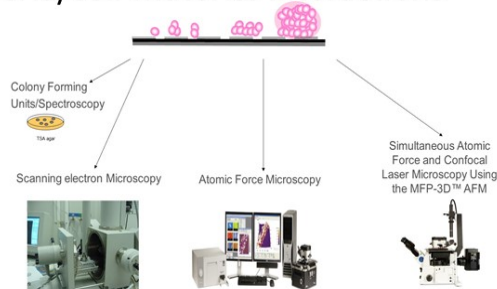
Nanoindentation/Wear



S_CAM



- Bacteria/cell-material interactions

**Publications and other outputs relevant to your interest in this programme (up to 5)**

Please give references to your key recent research publications

1. Physicochemical and antibacterial characterisation of a novel fluorapatite coating. Al-Hilou A., Do T., Mizban L., Clarkson B.H., Wood D.J. **Katsikogianni M.G.*** ACS Omega 2016; 1(2): 264-276.
2. Biomaterial functionalized surfaces for reducing bacterial adhesion and infection. **Katsikogianni M.G.**, Wood D.J., Missirlis Y.F. Handbook of Bioceramics and Biocomposites, Springer published January 2016, pp 1-28.
3. Assessing Probable Mechanisms of Bacterial Adhesion to Biomaterial Surfaces. **Katsikogianni M.G.**, Missirlis Y.F. Accepted by Encyclopedia of Surface and Colloid Science, 3rd Ed, Taylor and Francis, 2015.
4. Cell vs. bacterial viability in the presence of host defence peptides and RGD. **Katsikogianni M.G.**, Hancock R.E.W., Devine D.A., Wood D.J. European Cells and Materials 2015; 30(2): 55.
5. Bioflavonoid Coated Materials. Thomas H., Dowling D.P., **Katsikogianni M.G.** Patent publication numbers GB2505248 and WO2014030005 A1, 2014.