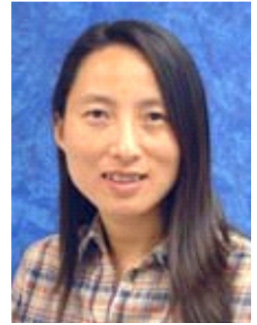


Science Bridges China Research Profile

Name: Dr Jun Jie Wu
Position: Senior Lecturer (Associate Professor)
Director of Centre for Biomedical Engineering
Institute/division: Durham University/School of Engineering and Computer Sciences
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SUMMARY OF MY RELEVANT RESEARCH AREAS:

Full range of knee and hip prostheses; tissue science; medical devices; mechanical properties of soft tissue and their fixation; smart (stimuli responsive) materials

各种膝关节和髋关节假肢; 组织科学; 医疗设备; 软组织及其固定的机械性能; 智能(刺激反应)材料。

Primary Research interests:

My primary research goal are the development of biophysical methods and biomaterials manufacturing that will contribute to products, novel therapies and novel drug delivery system to combat age-related visual and mobility impairment and loss of these functions.

Implant Engineering Theme – to combat mobility impairment and loss of function due to Osteoarthritis and Rheumatoid arthritis. This include furthering the understanding of the lubrication of natural and diseased joints in collaboration with rheologists and clinicians, as well as biotribology for orthopaedic engineering.

Ligament Tissue Engineering Theme – Ligament tissue engineering and soft tissue biomechanics build upon my earlier work on fresh flexor tendons and my current work in this area.

Ocular Tissue Engineering Theme – to combat visual impairment such as cataract and presbyopia. To date we have studied the behaviour of lens capsule tissue and the behaviour of lens epithelial cells on 2D and 3D supports and such research areas are of growing importance to me. Building upon these achievements and deep interest, future aims include the delivery of a robust 3-D bioengineered immuno-compatible biodegradable biosupports and investigation of increasing base membrane permeability using chemical engineered drug delivery methods



Knee Joint with Prosthesis
Showing Bone Loss due to
Osteolysis

Topics in which you would like to develop collaborative research:

Any of the above mentioned primary interests which in summary are: experimental determination of and numerical modelling of natural and synthetic polymers, biomaterials for prostheses bearing surfaces, and functional tissue engineering

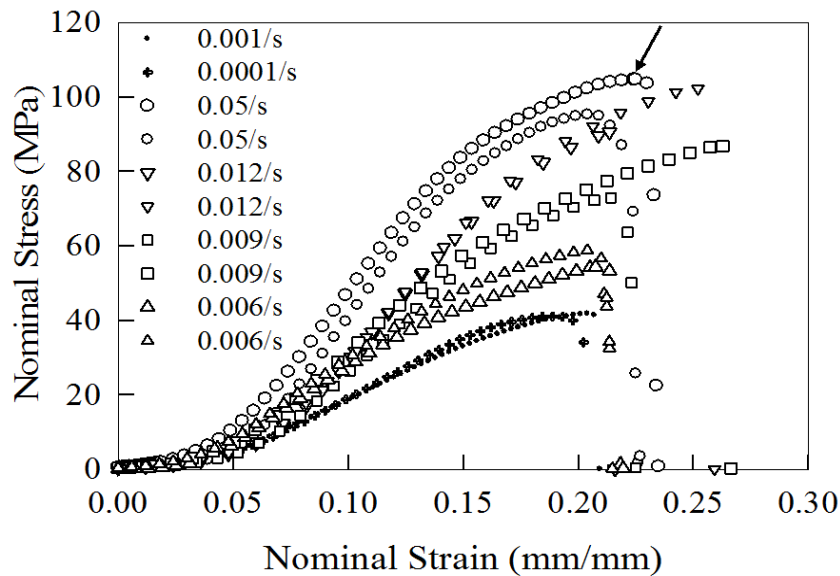
Relevant existing collaborations (academic/clinical/commercial) inside or outside China.

Academic (UK): Newcastle Medical School; University of Oxford

Clinical (UK): James Cook Hospital; Freeman Hospital NHS

Commercial (UK): Biomet Europe Ltd; Morgan Advanced Ceramics; Corin Group

Relevant graphics, figures, pictures:



Constitutive Behaviour of Soft Tissue (Tendon)

Publications and other outputs relevant to your interest in this programme

- 1) Williams SR, Wu JJ, Unsworth A & Khan I (2011) Wear and Surface Analysis of 38mm Ceramic-on-Metal Total Hip Replacements Under Standard and Severe Wear Testing Conditions. Proc. IMechE Part H: Journal of Engineering in Medicine 225: pp 783-796.
- 2) Wu JJ, Augustine A, Holland JP & Deehan DJ (2011) Oxidation and Fusion Defects Synergistically Accelerate Polyethylene Failure in Knee Replacement. Knee Feb 14th doi:10.1016/j.knee.2011.01.004
- 3) Williams SR, Wu JJ, Unsworth A & Khan I (2009). Tribological and Surface Analysis of 38mm alumina-as cast CoCrMo Total Hip Arthroplasties. Proc. IMechE Part H: Journal of Engineering in Medicine 223: pp 941-954.
- 4) Reay E, Wu J, Holland J & Deehan D (2009). Premature failure of Kinemax Plus total knee replacements. Journal of Bone and Joint Surgery (Br) 91-B: pp 604-611.
- 5) Wu JJ (2006). Quantitative constitutive behaviour and viscoelastic properties of fresh flexor tendons. The International Journal of Artificial Organs, 29 (9): pp852-857