BRITISH COUNCIL

RESEARCHER LINKS

Newton Fund

Research Profile

Name: **Dr. Farshid Sefat**
Position: **Programme Leader & Lecturer in Medical Engineering**
Institute/division: **University of Bradford, UK**
Email: F.Sefat1@Bradford.ac.uk
Tel: **(00) 441274-23367 / (00) 4478-138-17460**

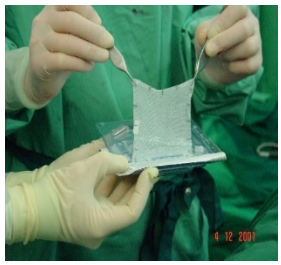
SUMMARY OF MY RELEVANT RESEARCH AREAS:

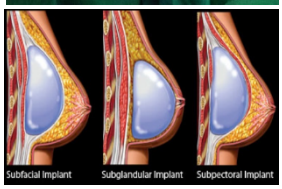
My research is based on developing biomaterials to control cellular behaviour with particular emphasis in developing engineered materials for tissue engineering of bone/cartilage, skin/hair, cornea and blood vessel.

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

Primary Research interests:

Dr. Farshid Sefat is Programme leader and lecturer in Medical Engineering at the University of Bradford and previously he was Head of Biomedical Engineering Department at King Faisal University (Saudi Arabia). He completed his Post Doc at University of Sheffield (UK). He received his Ph.D. (2011) and BEng. (2005) degrees from University of Bradford (UK) both in Biomedical Engineering. He also obtained his MSc. (2006) in Cell and Tissue Engineering from Keele University (UK).





Main Research Projects include:

1. Skin/Hair Tissue Engineering:
- Optimisation of layer-by-layer 3D scaffold for dermal wound healing
- Formation of hair follicle using 3D biomimetic nanofibers constructs

2. Cornea Tissue Engineering:
- Fabrication and characterisation of biodegradable scaffolds for cornea tissue engineering

3. Bone/Cartilage Cell Engineering:
- Effect of cannabinoids in wound healing of bone and cartilage cell monolayer
- Cell signalling pathways of Transforming Growth Factor Beta (TGF-β isomers)
- Fabrication and characterisation of hydrogels for cartilage repair

4. Vascular Tissue Engineering:
- Fabrication and characterisation of Electrospun polymer for vascular tissue engineering

5- Breast Reconstruction:
- Functional composite scaffold for local drug delivery in situ postoperatively in breast cancer patients

6. Electrospun Nanofibers for Dental Applications
- Histatin Peptides: Types, Function and it's Applications in Bio-Dental Research

Topics in which you would like to develop collaborative research:

a) Fabrication/Charactrisation of novel vascular graft
b) Biomaterials fabrication & characterization for soft and hard tissue
c) Optimisation of thermosensitive hydrogels for cartilage repair
d) Investigate the effect of mechanical stimulation for chondrocyte repair
e) Suitable polymeric electrospun scaffold for breast cancer treatment

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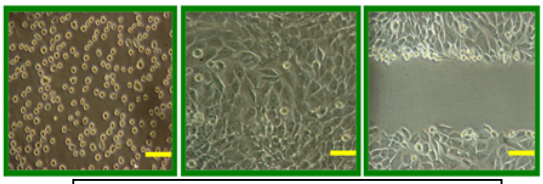
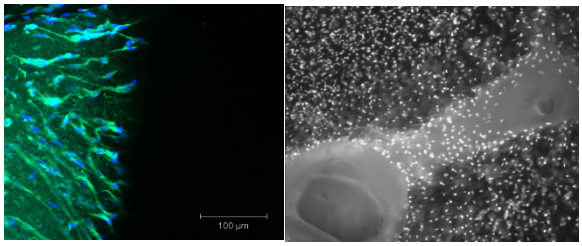
Relevant existing collaborations (academic/clinical/commercial) inside or outside China.

USA – Stevens Institute of Technology	(Skin and Hair Tissue Engineering)
UK – Neotherix	(Electrospun Scaffold for Breast Cancer Treatment)
UK – University of Manchester	(Electrospun Scaffold for Vascular Graft)
Malaysia - Universiti Tun Hussein Onn	(Bone and Cartilage Cell Engineering)
India – LV Prasad Eye Institute	(Biomaterials Fabrication for Cornea Tissue Eng.)
Saudi Arabia – King Faisal University	(Optimisation of Electrospun Scaffold for Skin repair)

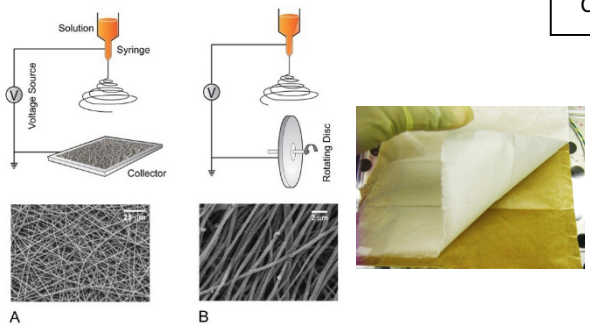
Relevant graphics, figures, pictures:



Wound healing of bone cell monolayer



Cornea explant outgrowth in cells from explants



Electrospinning of polymers for Tissue Engineering applications

Cytotoxicity test – PLGA scaffold on Rabbit cornea

Electrospun PCL/Coll nanofibers for full thickness wound repair

Regeneration of Hair Follicle-like Structures within 3D Biomimetic Nanofiber

Publications and other outputs relevant to your interest in this programme

1. **SEFAT F**, MAHJOUR B, POLUNIN Y, WANG L and WANG L (**2016**): "Improved cell infiltration of electrospun nanofiber mats for layered tissue constructs" *J Biomed Mater Res A*, Wiley.

2. **SEFAT, F.**, YOUSEFFI, M., KHAGHANI, S.A., SOON, C.F., JAVID, F. (**2016**) Effect of Transforming Growth Factor-β3 on mono and multilayer chondrocytes, Cytokines, 83:118-26.

3. MAHJOUR B, FU X, YANG X, **SEFAT F** and WANG H (**2015**): "Rapid creation of skin substitutes from human skin cells and biomimetic nanofibers for acute full-thickness wound repair" *Burns*, Elsevier, **41** (8): 1764–1774.

4. DESHPANDE P, ORTEGA I, **SEFAT F**, SANGWAN V.S. and MACNEIL V.S. (**2015**): "Rocking Media Over Ex Vivo Corneas Improves This Model and Allows the Study of the Effect of Proinflammatory Cytokines on Wound Healing" *Invest Ophthalmol Vis Sci.*, **56** (3): 14-15308.

5. DESHPANDE P, RAMACHANDRAN C, **SEFAT F**, RYAN A.J. and MACNEIL A.J. (**2013**): "Simplifying corneal surface regeneration using a biodegradable synthetic membrane and limbal tissue explants" *Biomaterials*, Elsevier, **34** (21): 5088-106.