

Processes for in-clinic manufacture

Our aim

Our aim is to develop new material printing, moulding and deposition techniques in order to support the in-clinic manufacture and configuration of bioactive devices for large defects which are load bearing, functionally gradient and biologically enhanced.

The **academic partners** in this project are Newcastle University (Dalgarno, German, Bretcanu, Fulton), the University of Bradford (Coates) and University of Nottingham (Grant, Ahmed). **Collaborators** are JRI Orthopaedics Ltd, Surgical Innovations Ltd, Glass Technology Services Ltd and Materialise NV.

This project has **two research challenges**: (1) Co-processing of cells and structural biomaterials whilst maintaining mechanical and biological function. (2) Development of micro-factories for in-clinic use.

Our approach

We will **assess**:

- > Printing and deposition techniques for their ability to deliver functionally gradient mechanical properties whilst simultaneously encapsulating a functionally gradient cell population through the structures.
- > Low temperature moulding techniques for their ability to quickly create porous hard/soft material combinations which could be infiltrated with cells, proteins and other agents.

We will initially **define** material combinations and processing windows in order to finalise basic device designs and methods of fixation, which could then be adapted to individual patient needs.

We will **produce** and **evaluate** these basic designs for their mechanical and biological function.

What we want to achieve

1. New micro-factories for manufacturing robust, functionally gradient tissue engineering scaffolds for use with minimally manipulated cells that have been harvested during surgery.
2. Characterisation of the combinations of mechanical and biological properties created.
3. Creation of implantable devices with functional and coherent bone-cartilage and bone-tendon/ligament interfaces.



Join our community

The MeDe Innovation Network exists to provide support to the medical device sector, including academic, industry and clinical members. As a member of the Network, you will benefit from:

- > access to information about manufacturing research, from our Centre's research outputs, international partnerships, and clinical centres in medical device innovation throughout the UK
- > access to Technology Roadmapping techniques to help shape and inform future research needs
- > updates on sector news and events, through e-newsletters, network events and an annual conference
- > access to commercial opportunities arising from our work with the Medical Technologies Innovation and Knowledge Centre
- > being part of an influential contributor to the UK medical device landscape
- > marketing opportunities to highlight your organisation's news and events on the MeDe Innovation website

Dissemination of research and moving it along to adoption and commercialisation is central to our mission and we value input from those working across the medical device sector in the UK. The network aims to not only inform, but also to connect, enabling businesses, policy makers, academics and clinicians to share information, knowledge and ideas and debate the challenges and issues facing the community.

Membership is free and it's easy to join – contact us now.

Contact us

MeDe Innovation The EPSRC Centre for Innovative Manufacturing in Medical Devices

c/o Institute for Medical & Biological Engineering,
University of Leeds, LS2 9JT

+44 (0)113 343 0923
mede-innovation.ac.uk
info@mede-innovation.ac.uk
🐦 @MeDe_Innovation