

Research Profile

Name: Natacha Rodrigues
Position: PhD researcher
Institute/division: School of Systems and Mechanical Engineering
Email: n.rodrigues2@ncl.ac.uk
Tel: (00)447985155432



SUMMARY OF MY RELEVANT RESEARCH AREAS:

- 1) *Polymers, glass-ceramics and composites*
- 2) *Bone and cartilage (osteocondral unit) bio engineering*
- 3) *Innovative manufacturing routes and customized medical devices.*

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

Primary Research interests:

Manufacture (1) and Characterisation (2) of different materials suitable for bone & cartilage tissue engineering.

- 1) **Manufacturing** routes that are related with additive manufacturing techniques (preferentially combination of them): I have worked with Fused deposition modelling (FDM), binder jetting 3D printing and filament (polymer and composites extrusion);
- 2) **CAD/CAM** : inventor Autodesk (independent user)
- 3) **Characterisation** of polymers and Glass-ceramics:
 - A) Thermal properties (DSC, TGA, DTA and TGA-MS),
 - B) Surface, particle size distribution ,morphology, porosity, chemical composition and crystallinity : SEM-EDX, Micro-CT, XRD, GPC and Laser diffraction (Mastersizer),
 - C) In vitro bioactivity and degradation studies ,
 - D) Mechanical properties of scaffolds that match bone (trabecular and cortical): tensile and compression tests.

Topics in which you would like to develop collaborative research:

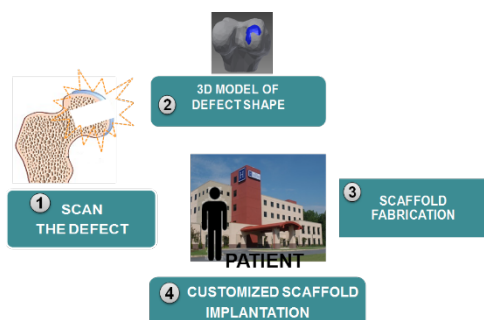
1. Additive manufacturing and/or innovative routes that allow in clinic manufacturing/ micro factories of medical devices (class III);
2. Hybrid composites that match osteochondral unit requirements;
3. Product R&D and market approval (from academia to industry).

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

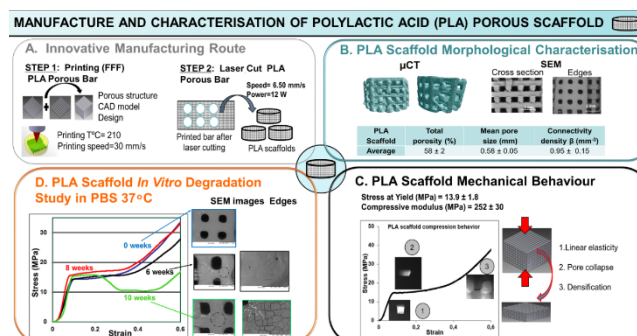
United Kingdom PARTNERS: Bradford University, Leeds University, Nottingham University and Sheffield University. Materialise and GTS (glass technology services company)

Relevant graphics, figures, pictures:

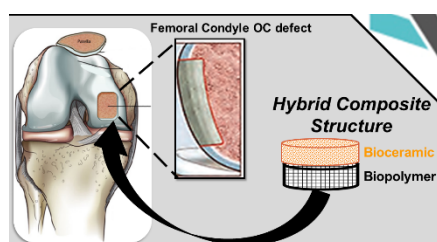
Use this area to show pictures or scientific figures which illustrate your research



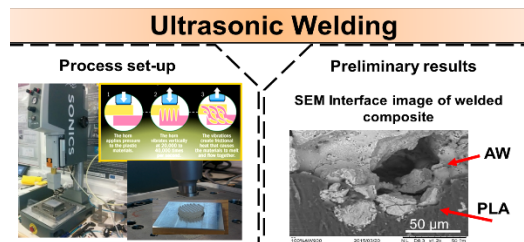
In-clinic Manufacture concept



PLA scaffold (trabecular bone analogue)



Hybrid composite concept and preliminary results

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

Rodrigues N, Benning M, Ferreira AM, Dixon L, Dalgarno K. *Manufacture and Characterisation of Porous PLA Scaffolds*. Procedia CIRP 2016, 49: 33-38

Doi: <http://dx.doi.org/10.1016/j.procir.2015.07.025>