

# AMADEUS

Advanced MAterials by DEsign





Inserm U1026

## Tissue Bioengineering

#### PERMANENT STAFF

→ Nine permanent researchers and 5 engineers are involved in AMADEus-relevant projects



Joëlle Amédée Senior Res. Team leader



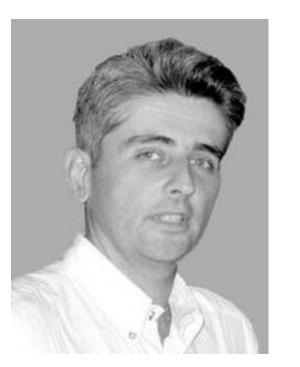
Laurence Bordenave Res Prof.



Olivier Chassande Junior res.



Fabien Guillemot Junior Res.



Jean Christophe Fricain

Res. prof.



Damien Le Nihouannen Ass. Prof.

### MOBILIZED COMPETENCES

- Tissue engineering
- + Biomaterial science + Laser assisted bioprinting
- + Human stem cell biology sciences
- + Cell / biomaterial interfaces
- + Experimental models (tissue /biomaterial interfaces and bioimaging

- Bone and vascular tissue engineering
- Human adult stem cell cultures and their cell biology
- Laser interactions with biomaterials and biological tissues / biofabrication
- Local micro-environments modifications through laser interaction (mechanical and biochemical gradients)
- Cell interfaces with 2D functionalized surfaces
- Cell fate within a 3D (functionalized) scaffold (polymer, composite biomaterials...)
- Mechanical stress (flow chambers, bioreactor)
- Host tissue / tissue engineered constructs Preclinical models and bioimaging

#### MAIN FACILITIES

- Conventional facilities for human stem cell cultures and characterization (cell and molecular biology)
- Flow cytometry and confocal microscopy
- 2 workstations dedicated to Laser Assisted BioprintingSpecific
- Facilities for biomaterial characterization (SEM, profilometry...)
- Facilities for experimental models, surgery and bio-imaging.

**CURRENT AND FUTURE PROJECTS** WITHIN AMADEus FRAMEWORK

- Design and produce appropriate biocompatible and bioresorbable materials
- Understand the interaction between material surface and stem cells by integration of a set of skills and tools, such as targeting and signaling components.
- Create local mechanical and biochemical environments able to drive stem cell differentiation.
- Biofabrication on demand of 3D complex tissues and organs.
- Multifunctional large micro/nanopatterned matrices for tissue reconstruction
- Evaluate in vivo these tissue-engineered constructs using animal models for bone and vascular reconstruction, with the know-how of the technology transfert unit: CIC-IT Biomaterials.





