IN VITRO HYBRID MOCK-LOOPS Activities & Thesis Projects

Research Activities

Treatment's testing

Hands-on training



Experimental setup







In Vitro Hybrid Mock-loops

Biomechanics Research Group





3D-printers





CNC prototyping

Laboratory of Experimental Micro and Biofluid dynamics (µBS Lab)



Uniaxial tensile machine

In Vitro Hybrid Mock-loops

Biomechanics Research Group















In Vitro Hybrid Mock-loops

Biomechanics Research Group

MRI-compatible pulsatile experimental setup



Development of a MRI-compatible experimental setup under pulsatile flow conditions for 4D-flow MRI acquisitions

Activities

- Dimensioning of the experimental setup and simulations of fluid dynamic behavior using a LPM approach
- CAD design and manufacturing of experimental setup
- Experimental tests in the µBS Lab under pulsatile conditions
- 4D-flow MRI acquisitions in MRI room



Contacts: Fabio Pappalardo

In Vitro Hybrid Mock-loops

Simulated X-rays fluoroscopy acquisitions for clinicians' training



Development of an in vitro platform for simulated X-ray fluoroscopy acquisitions

Activities

- C-arm kinematics reproduction CAD design and manufacturing of a realistic C-arm
- Design and manufacturing of a physical mannequin for images acquisitions
- Images processing to replicate greyscale interface



Contacts: <u>Fabio Pappalardo</u>

In Vitro Hybrid Mock-loops

Soft Robotic Cardiac Simulator



Design and development of a soft robotic-actuated cardiac simulator for clinician training and device testing

Activities

- Enhancement of the soft robotic heart through CAD design and development of the experimental setup
- Implementation of an electro-pneumatic system for the control and regulation of the soft robotic heart
- Design and development of polymeric heart valves for modular integration into the ventricular model, enabling easy replacement and testing of different clinical scenarios.
- Experimental tests in the µBS Lab under pulsatile conditions

