

# Tissue mimicking materials for a realistic sensing environment

## Motivation

Wearable sensors performances are highly affected by the surrounding environment. This is why it is crucial to characterize an implantable device in a realistic set-up which takes into account also physiological conditions. Tissue mimicking materials (TMM) are artificial media which have similar acoustic properties to human tissues and which are therefore important for a realistic experimental characterization.

## Project

In this project, you will develop a new protocol to fabricate TMMs, acoustically characterize them and develop a smart design to encapsulate the sensor into them.

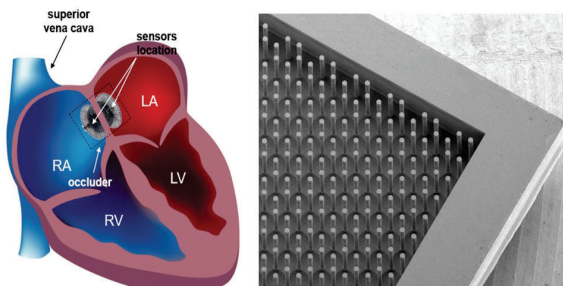


Figure 1: Schematic of an implanted sensing device in the human heart and SEM detail.

## Your Task

You will learn acoustic characterization techniques and you will have the opportunity to carry your experiments in the ultrasonic laboratory infrastructures at EMPA Dubendorf and ETH Zurich. You will develop and compare different protocols for the manufacturing of ultrasonic TMMs and the encapsulation of the sensor.

## Your Profile

- You are a student with a background in mechanical engineering/physics, looking for an experimental **Bachelor** or **Semester** project.
- You are good or interested in an **experimental** work, especially **prototyping** and **manufacturing**.
- You enjoy working in **different** research environments and you are a **collaborative** person.
- You are interested in gaining experience in an **interdisciplinary** project at the edge with **medicine**, **acoustics** and **microtechnologies**.

## You will learn how to:

- Manufacture TMMs according to physiological and medical requirements
- Acoustic characterization techniques at EMPA Dubendorf
- Scientifically present your data
- Work in different research labs (ETH Zurich and EMPA Dubendorf)
- Work in an interdisciplinary project with engineering and medical requirements

Contains: TMMs preparation (30%), Prototyping (40%), Acoustic measurements (30%)

## Contact:

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