**Title:** Mimicking the heart repair in vitro: the development of epicardial 3D organo-cultures

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**Background:** The emerging role of the epicardium in heart regeneration points at a largely unexplored reparative potential, boosting the number of studies focusing on this tissue.

**Aims:** This project aims at developing an ex vivo model to replicate the epicardial cell behaviour observed in vivo following injury or specific treatments that will enable the screening of arrays of gene/drug therapy candidates ex vivo, replacing animals in this type of studies.

**Methods:** Our model is based on the ex vivo culture of porcine superficial cardiac slices, comprising the epicardial layer and the underlying myocardial tissue (Epicardial/Cardiac-Tissue Slices, EpCardio-TS). Cardiac slices mirror the complexity of the heart tissue while allowing the high throughput approach needed for gene/drug discovery. Cardiac slices will be cultured in conditions mimicking the onset of myocardial infarction (heart attack) and the consequences will be studied at the cell level by immunofluorescence.

**Clinical perspective:** This enabling model will contribute to further our understanding of the contribution of the epicardium to cardiac repair.

**Techniques:** organo-culture slice preparation, 3D culture, bioreactor and flow culture, immunofluorescence, real time PCR