

NON-INVASIVE ELECTROMECHANICAL CELL-BASED BIOSENSORS FOR IMPROVED INVESTIGATION OF 3D CARDIAC MODELS

Advanced systems for basic cardiac investigation

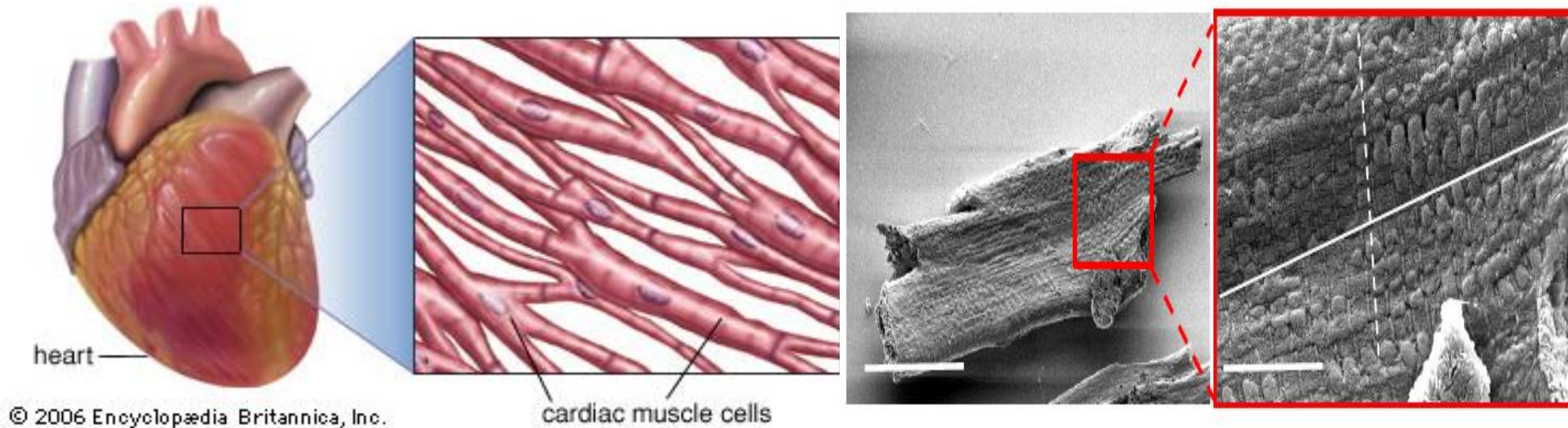


Presented by Guido Caluori, PhD

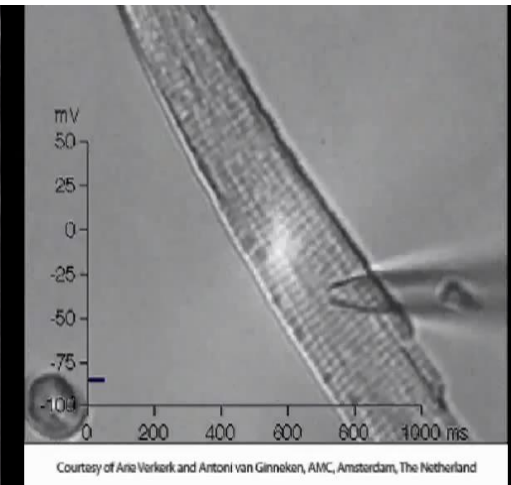
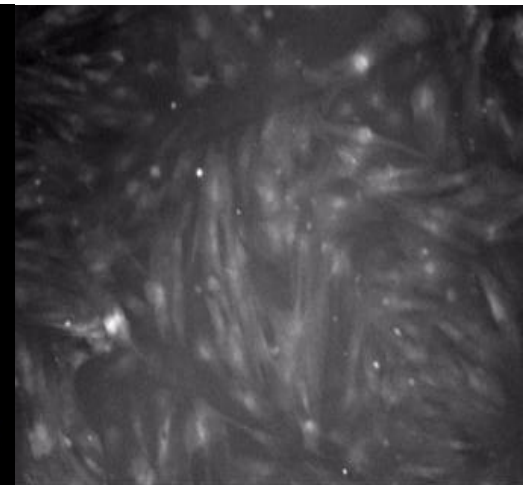
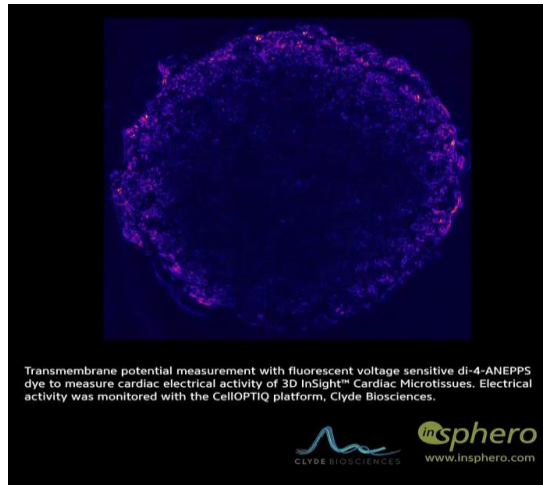
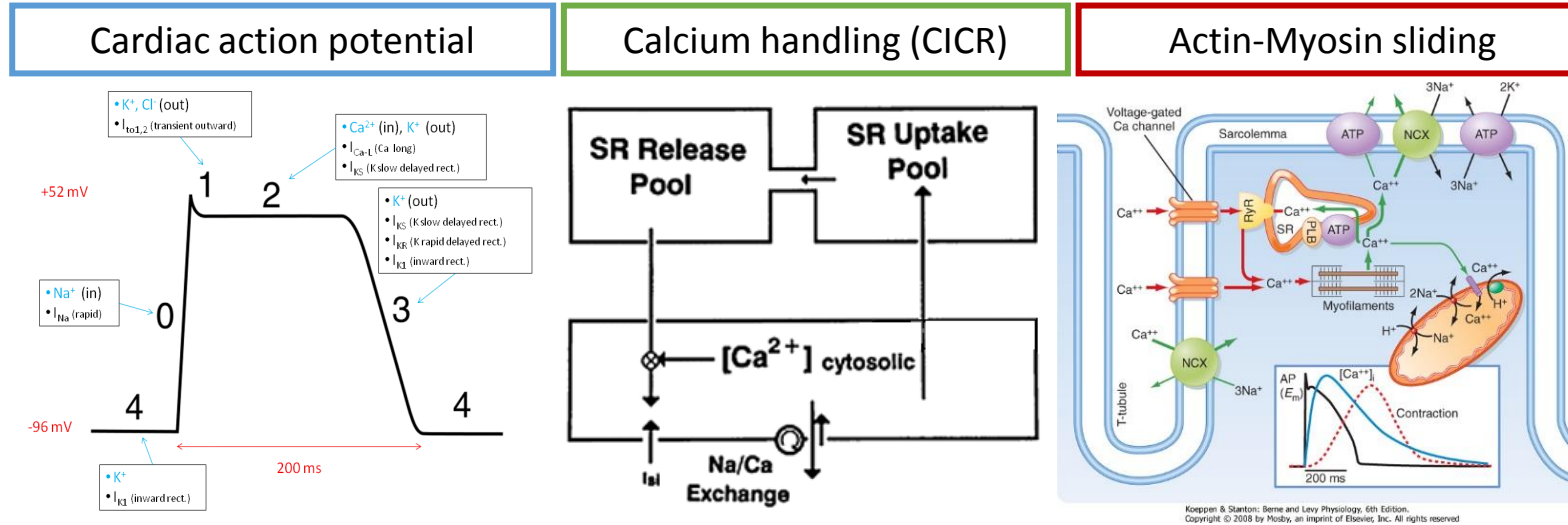
London, 13 May 2019



Cardiomyocytes as a nanobiotarget

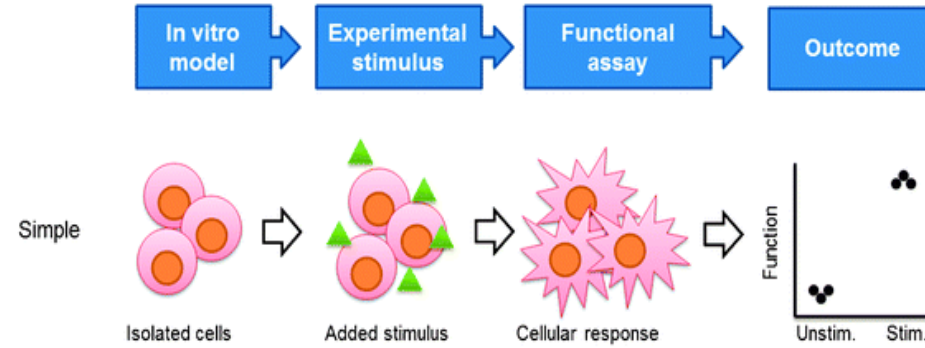


Cardiomyocytes as a nanobiotarget

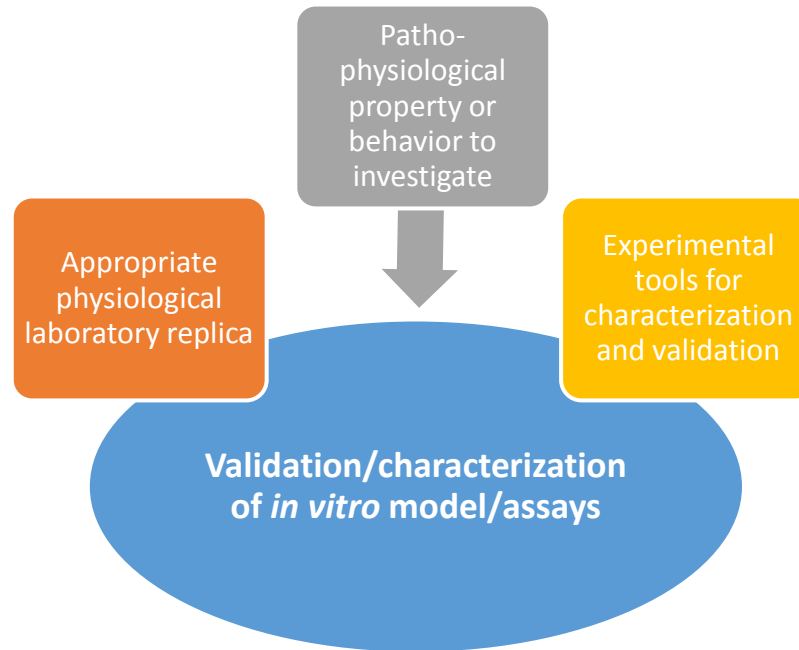


In vitro models: simplicity vs realism

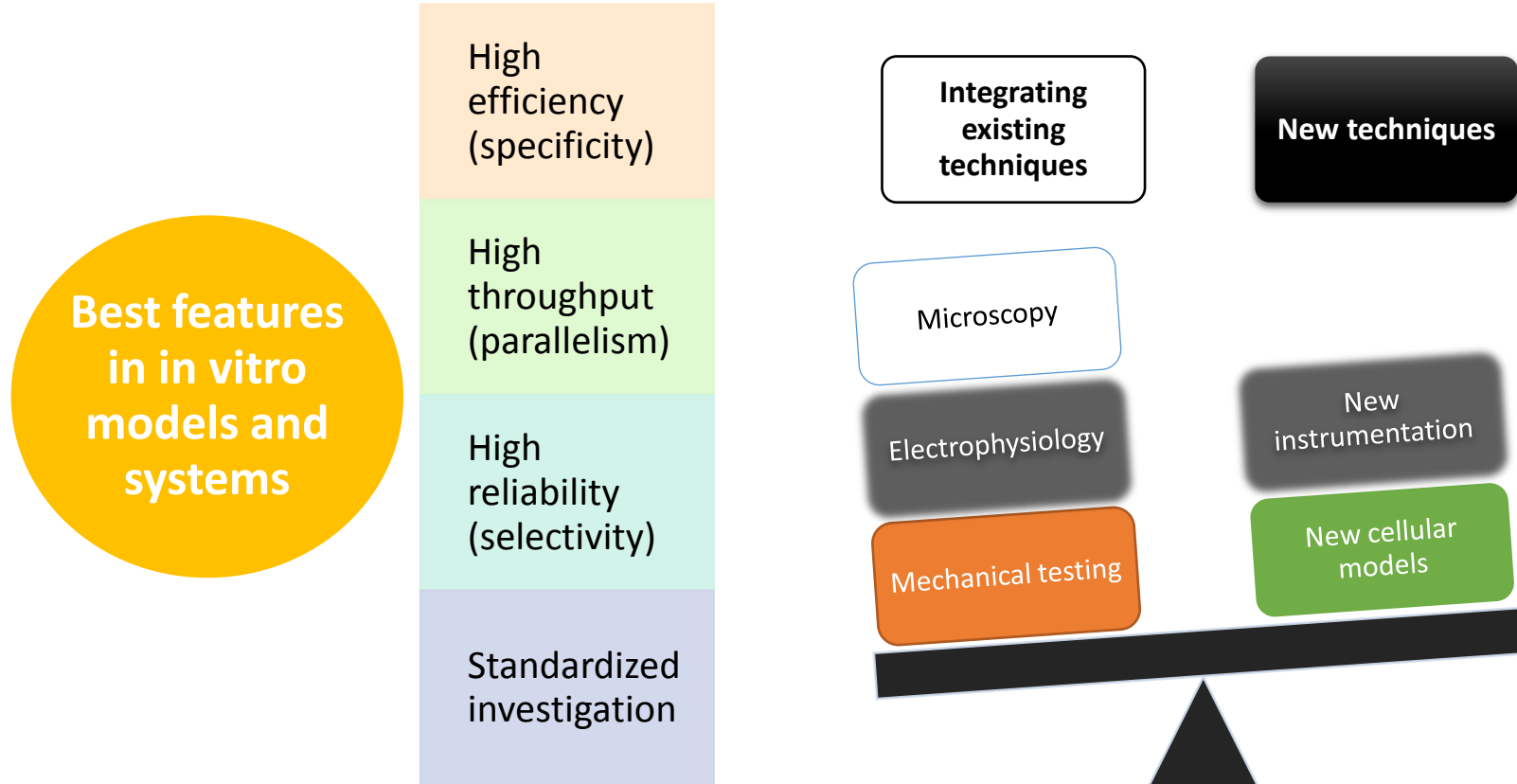
In vitro models



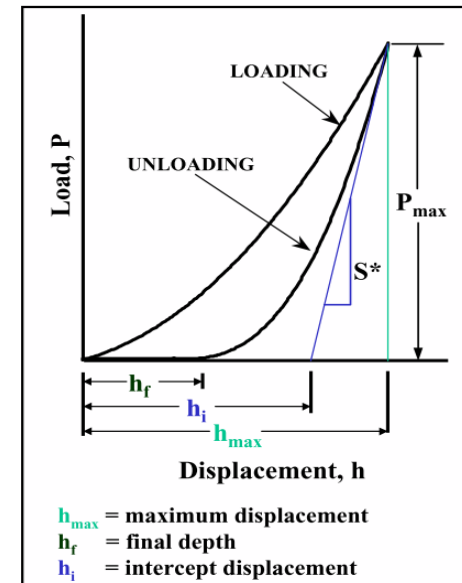
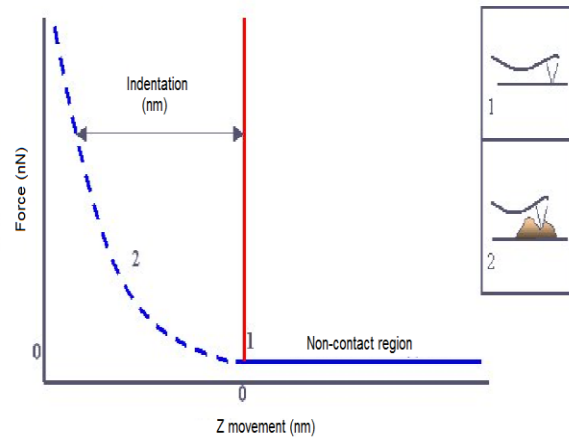
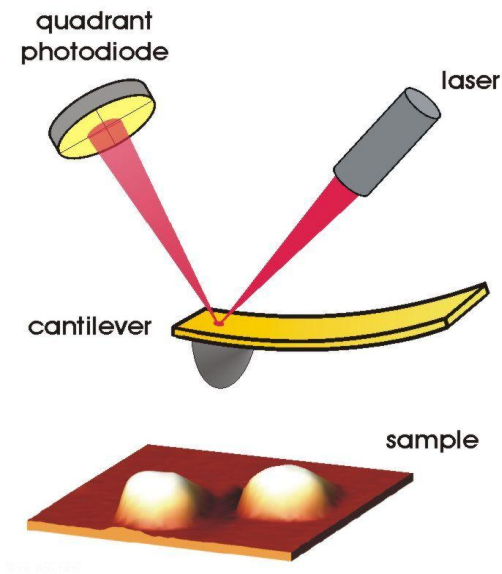
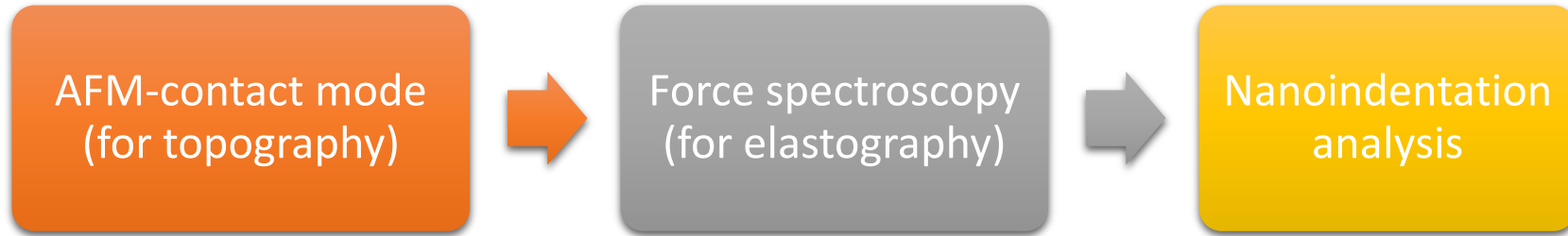
In vitro systems



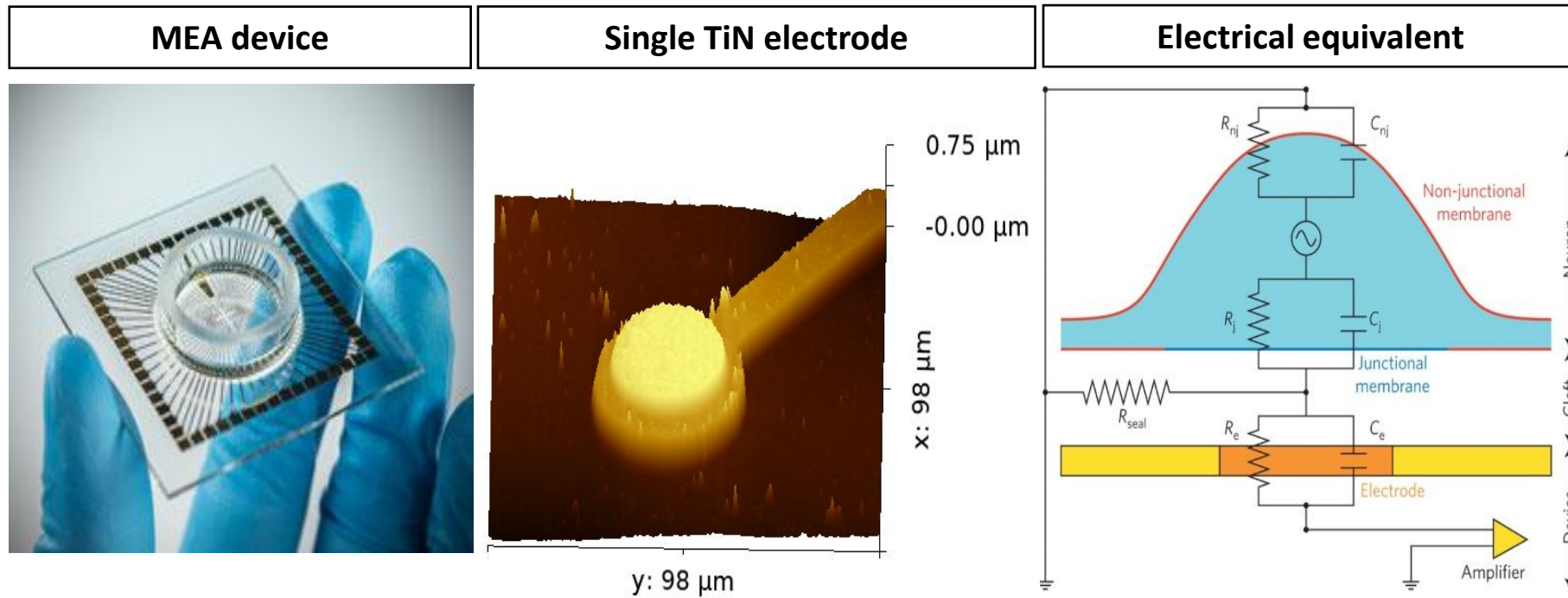
Engineering systems for *in vitro* models



Atomic force microscopy (AFM)

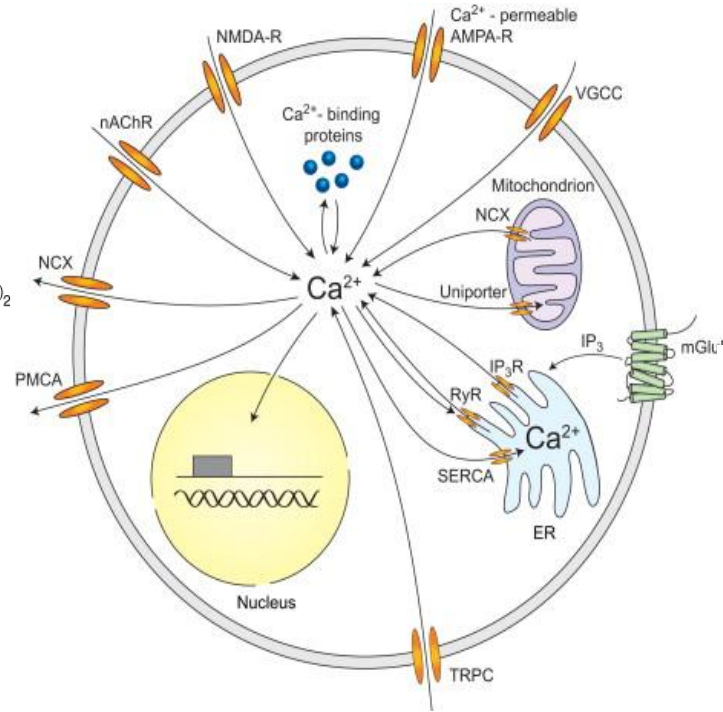
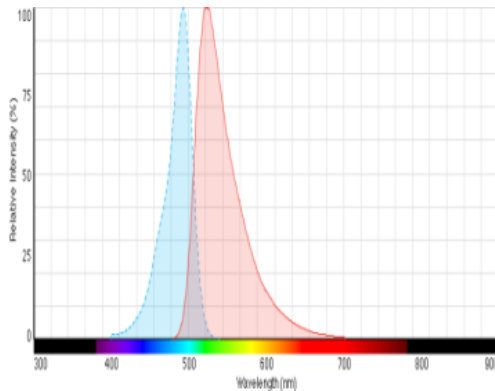
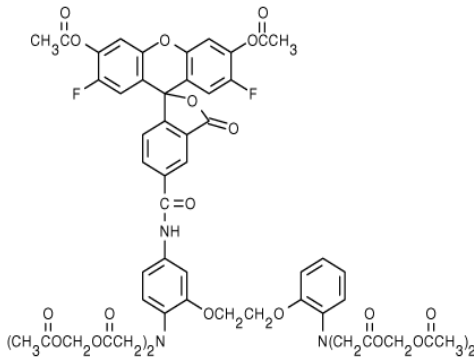


MEA-based electrophysiology

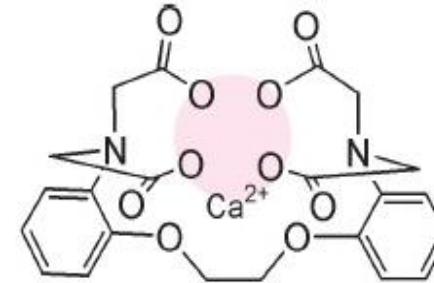


Calcium Imaging

Oregon-Green-AM

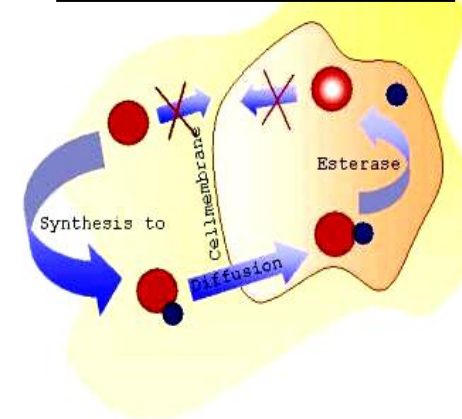


Ca²⁺ chelating agent

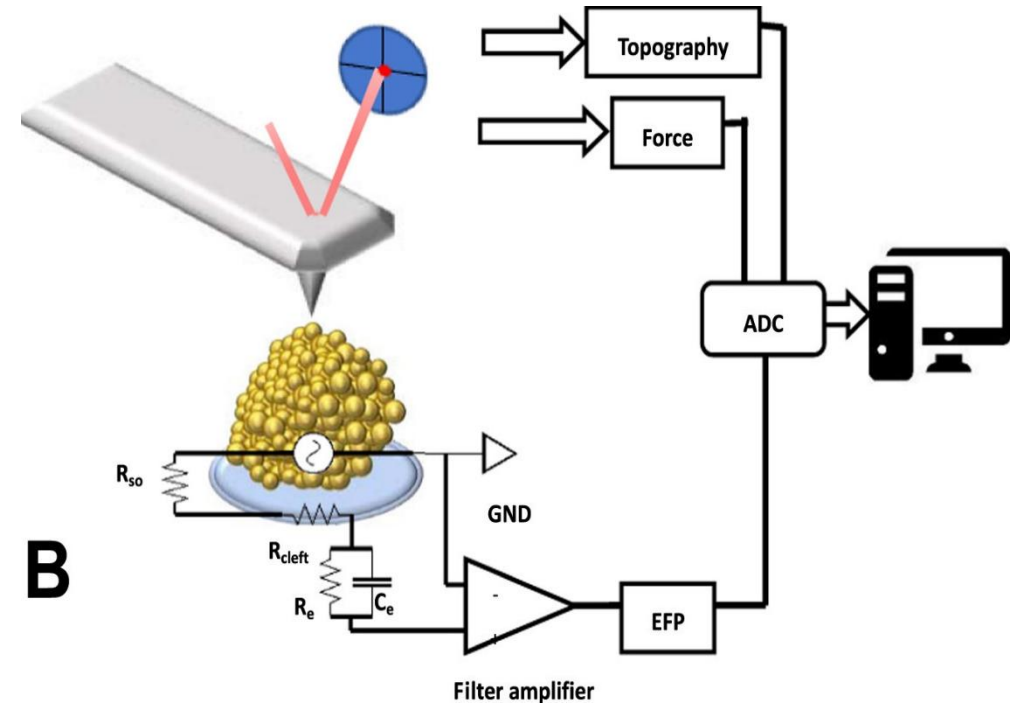
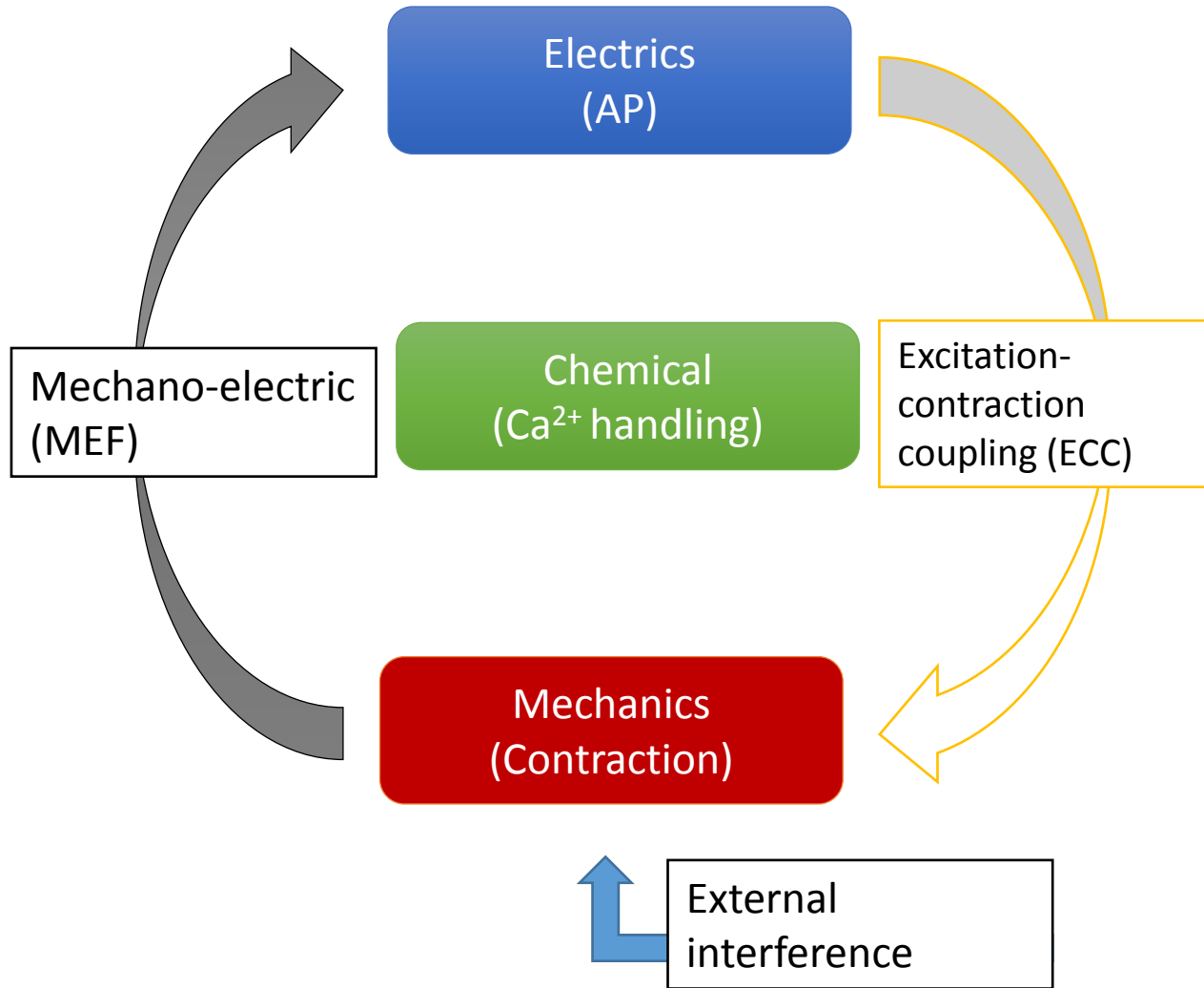


BAPTA-Ca complex

Esterase internalization

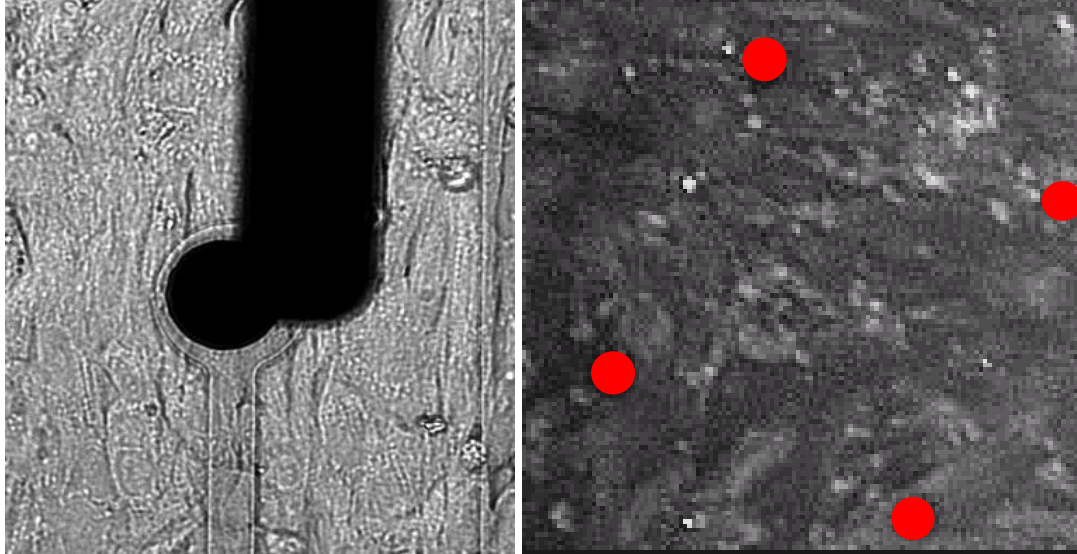


Setup design

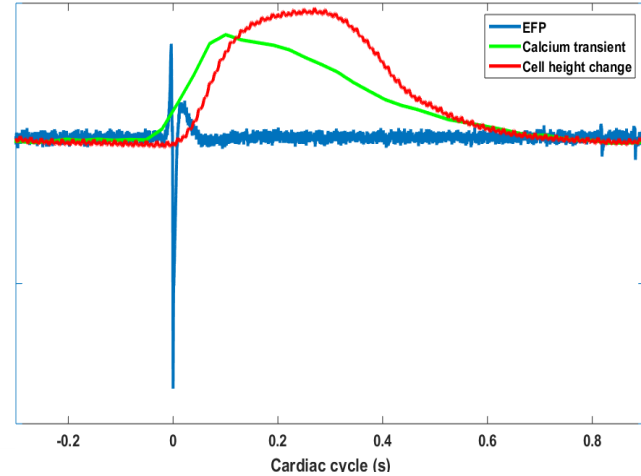


<https://doi.org/10.1016/j.bios.2018.10.021>

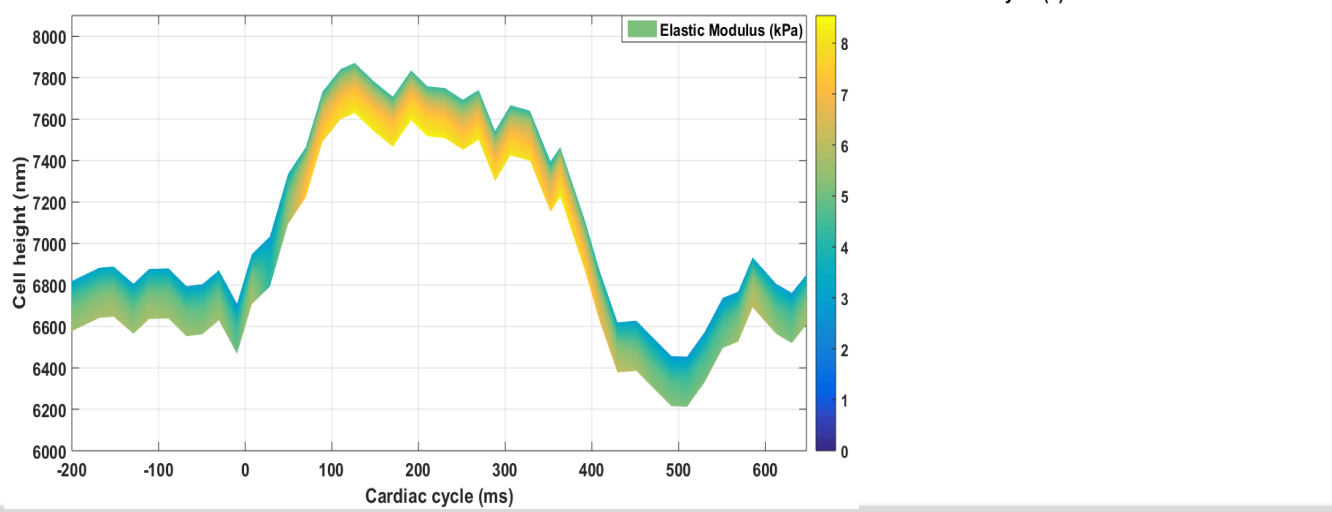
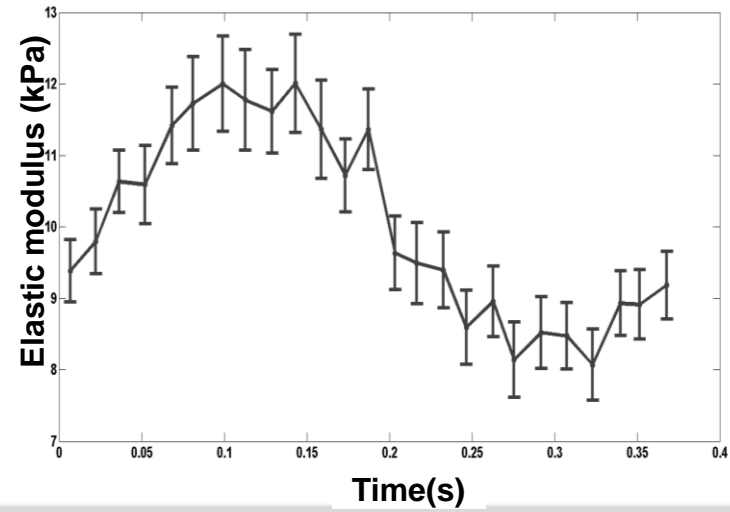
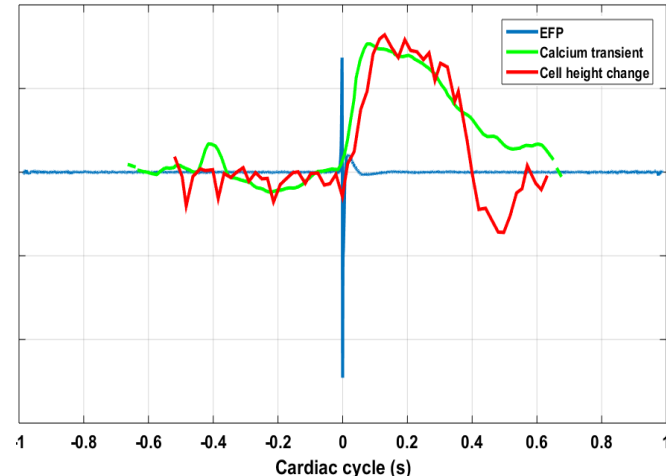
ECC monitoring proof of concept



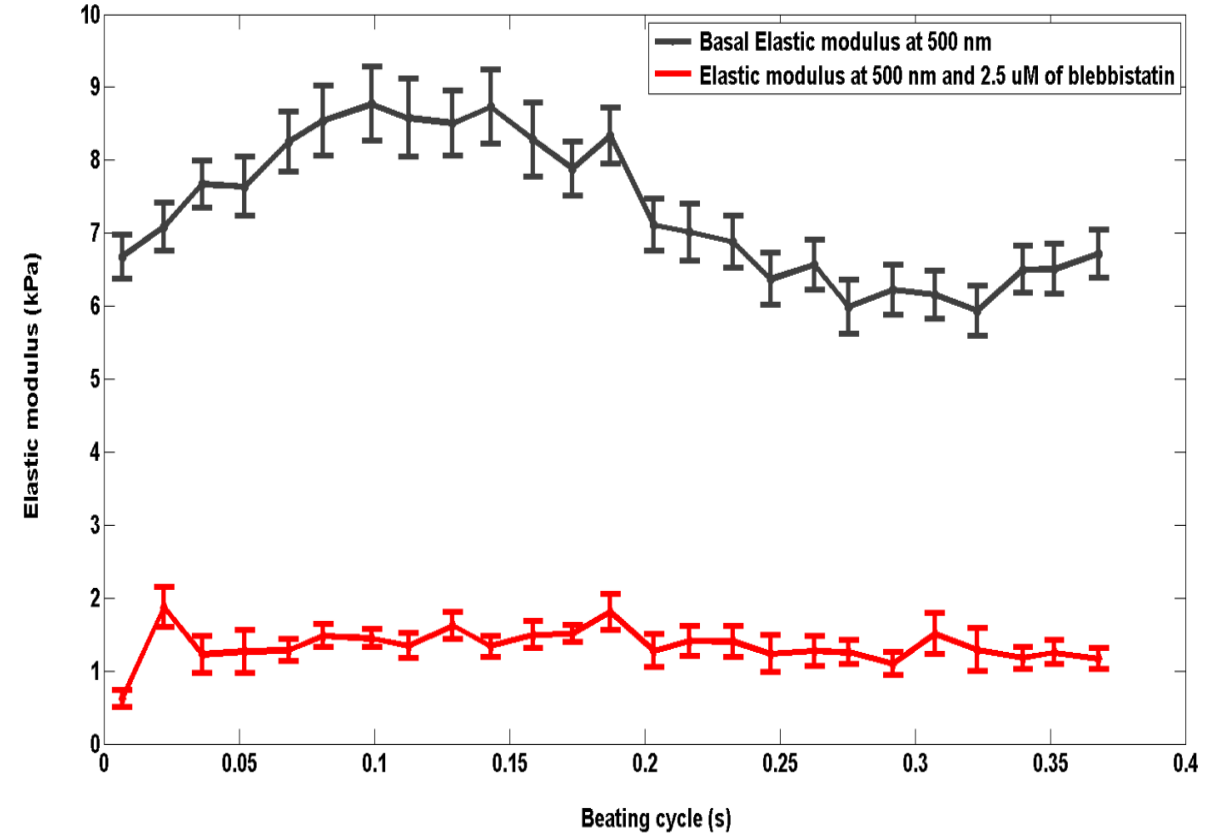
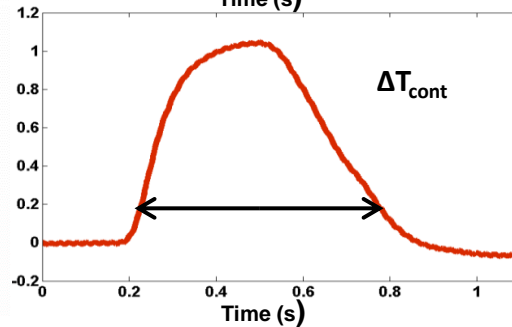
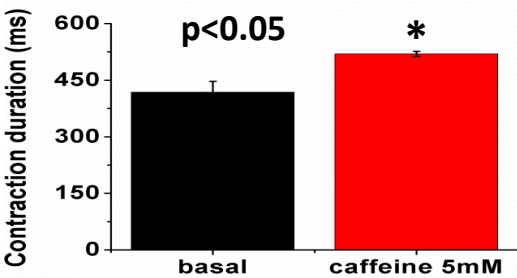
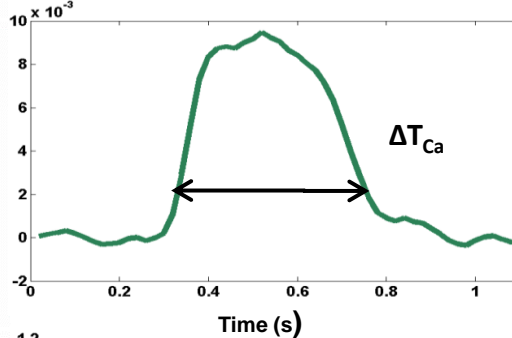
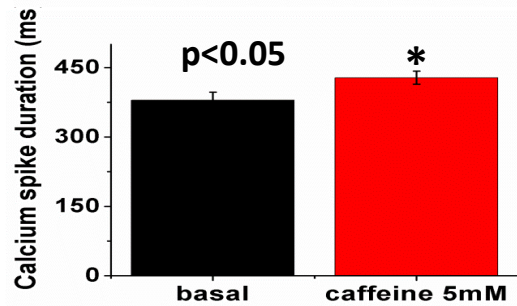
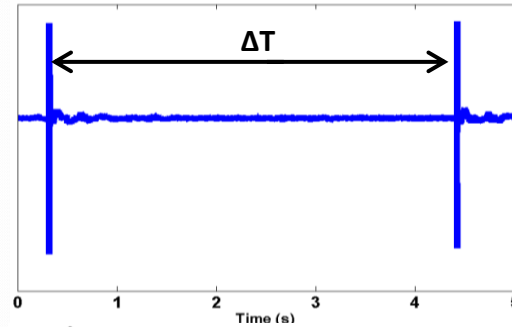
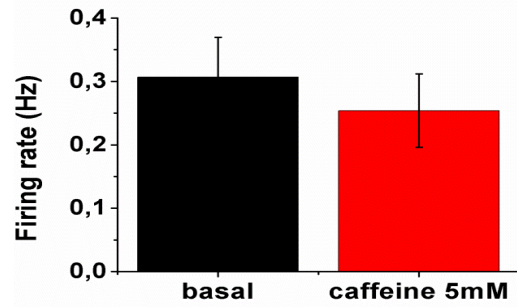
Continuous acquisition



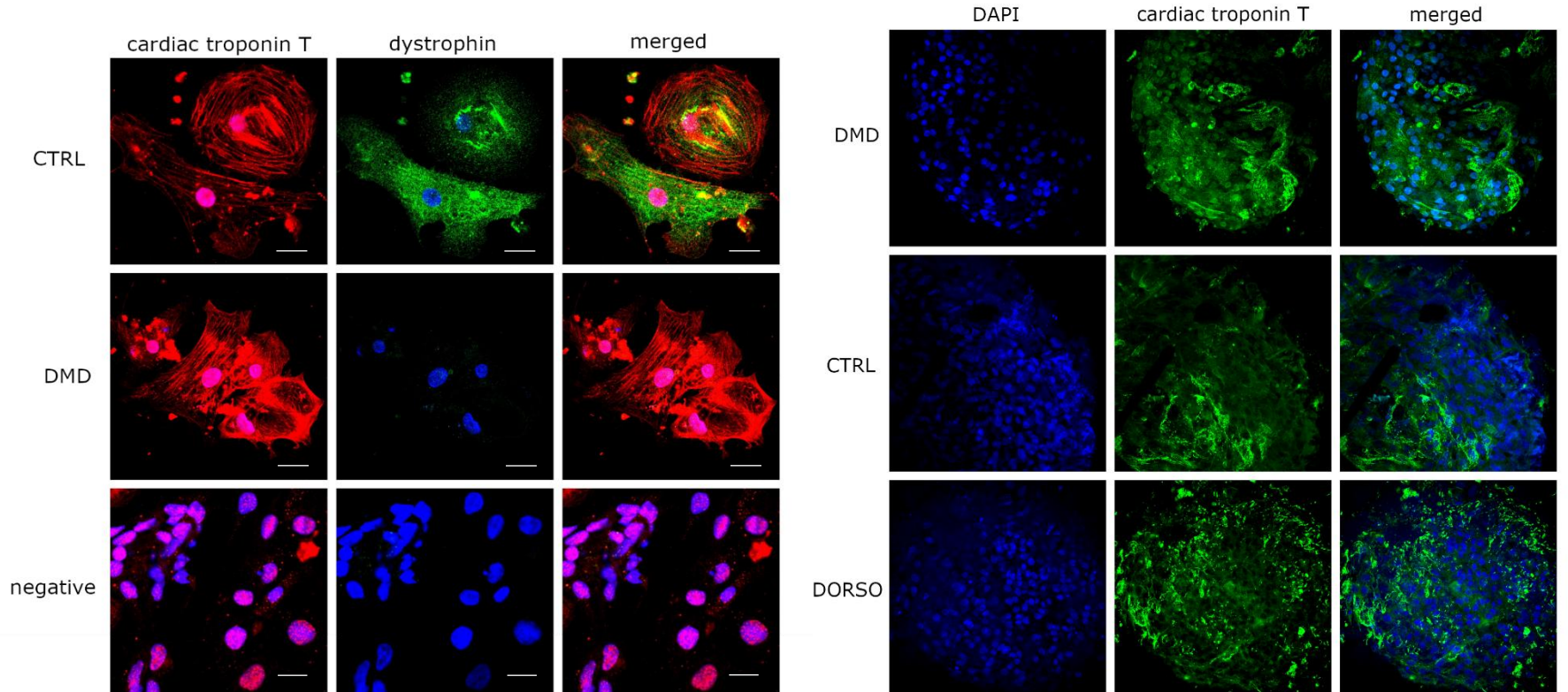
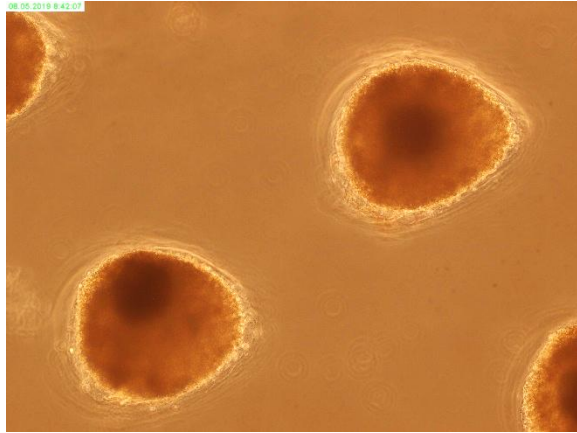
Triggered acquisition



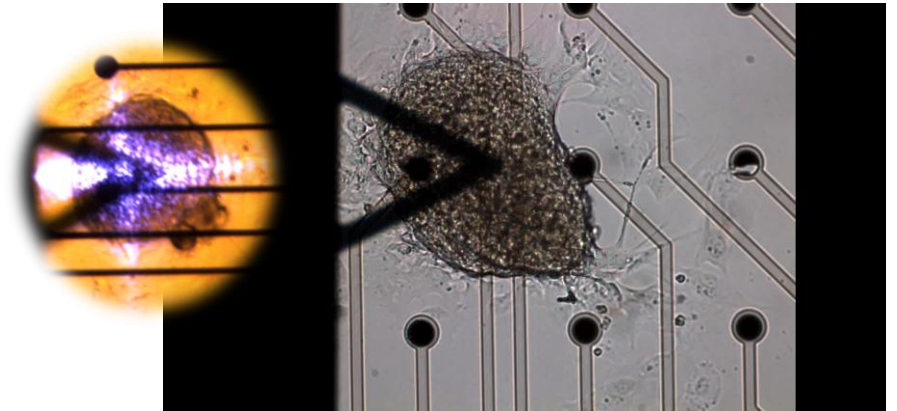
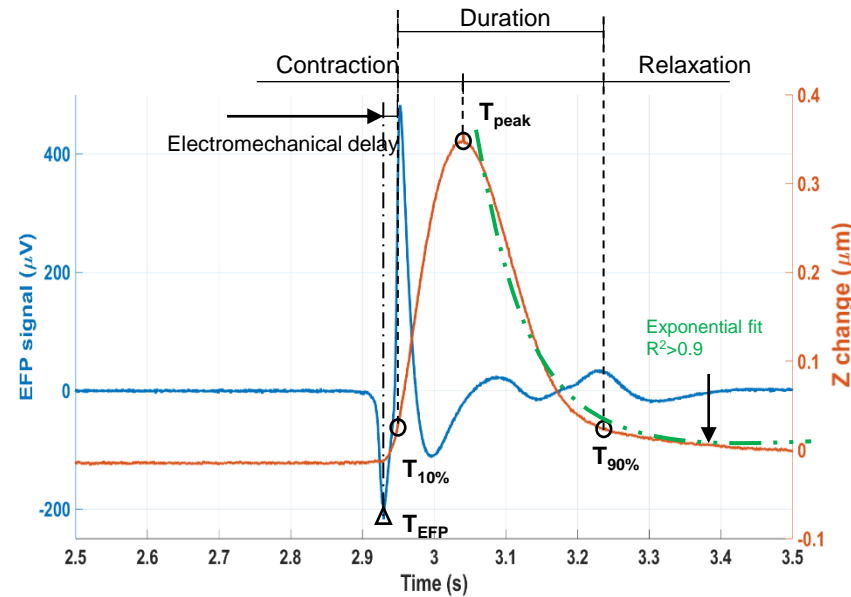
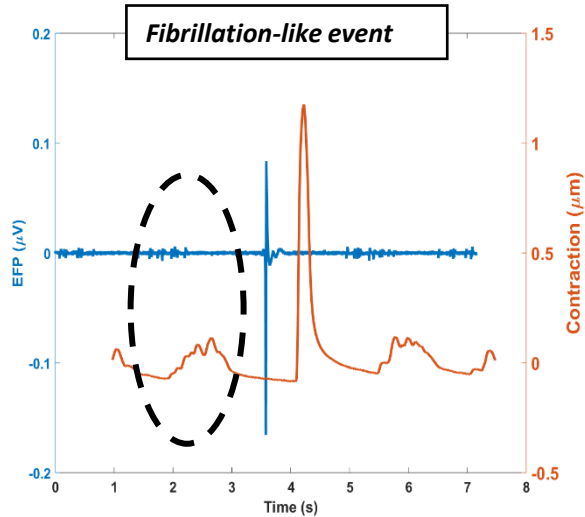
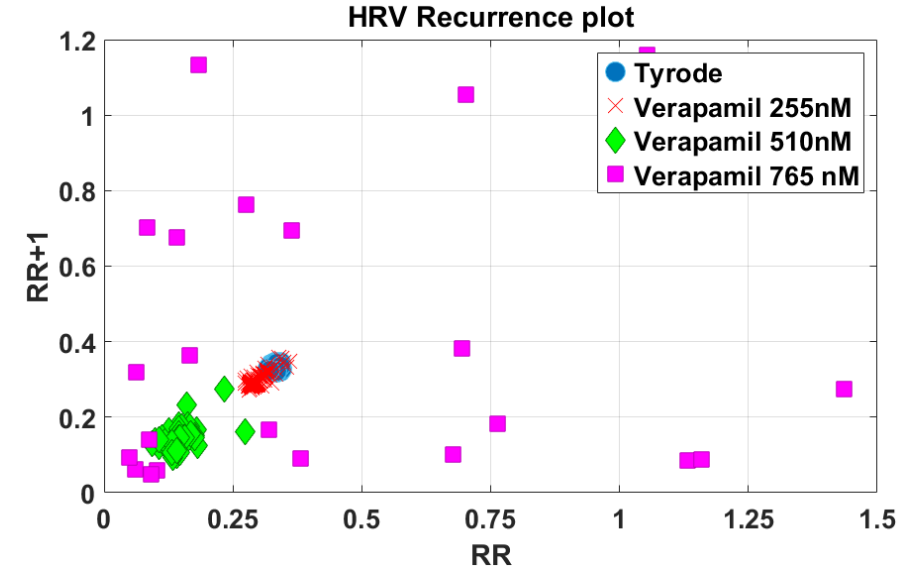
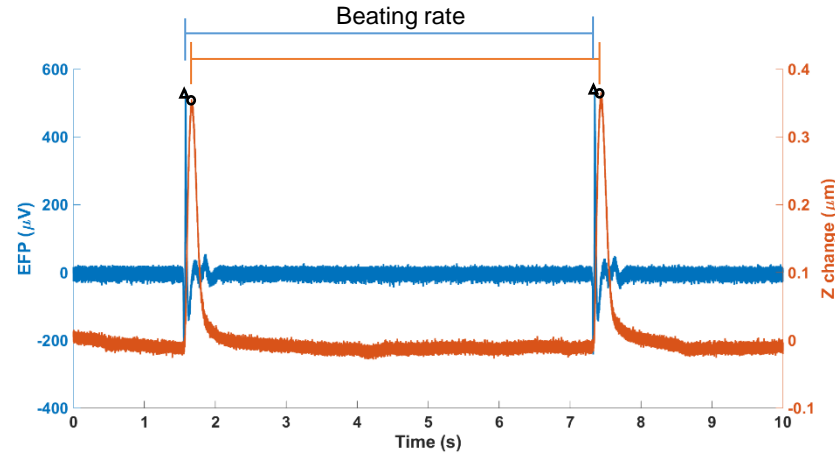
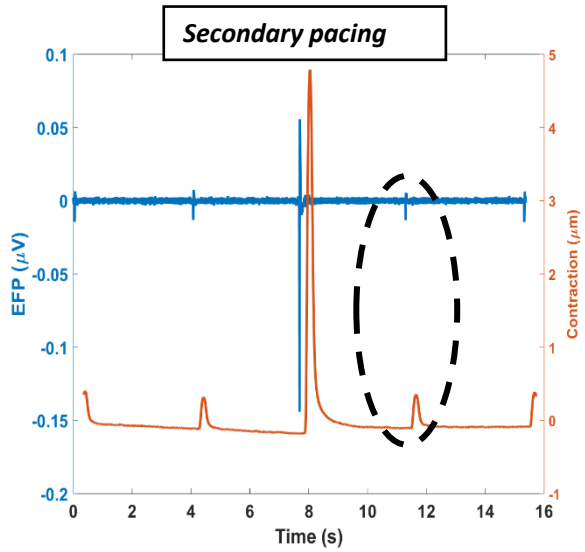
ECC monitoring proof of concept



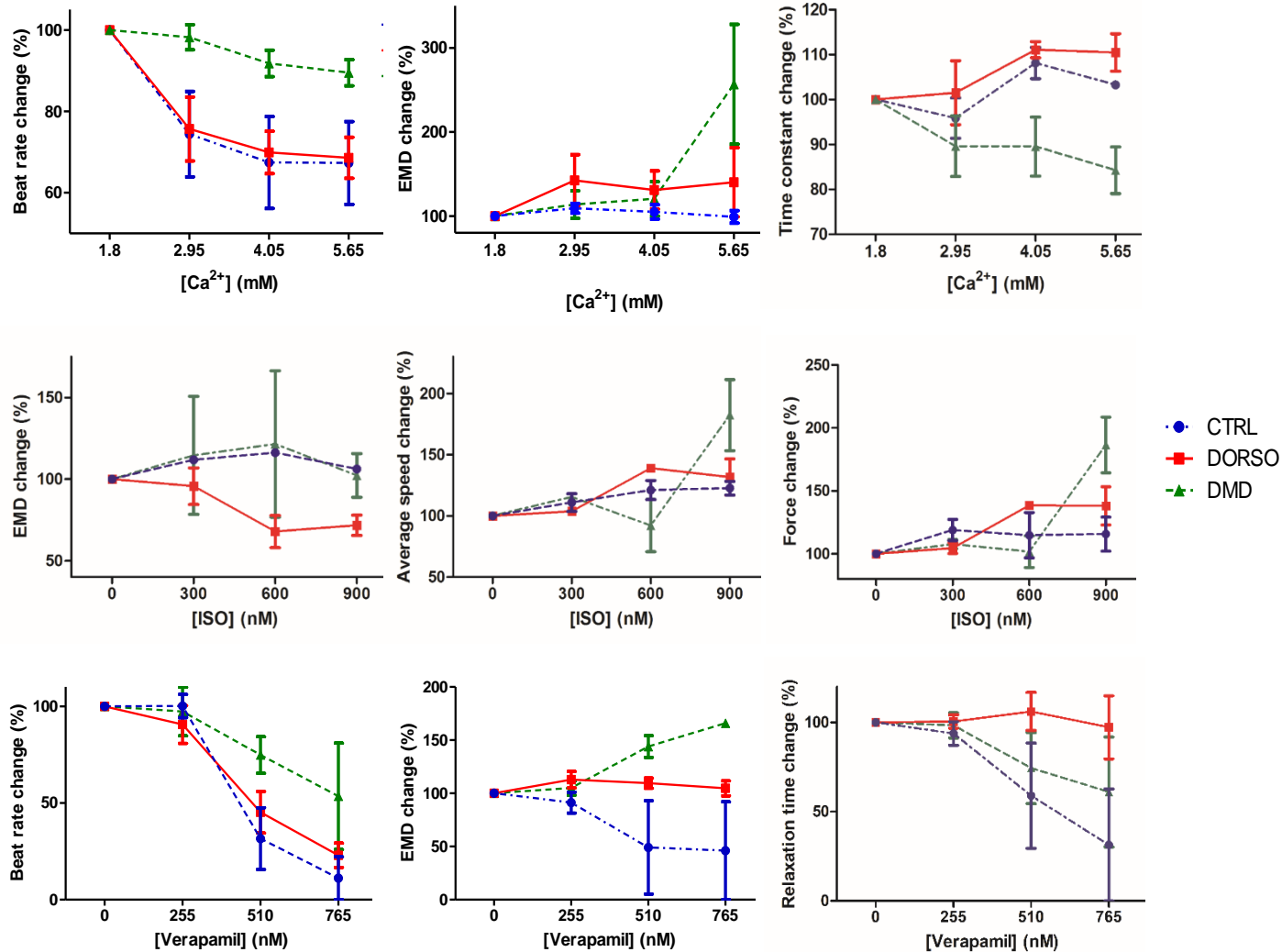
ECC monitoring – 3D models



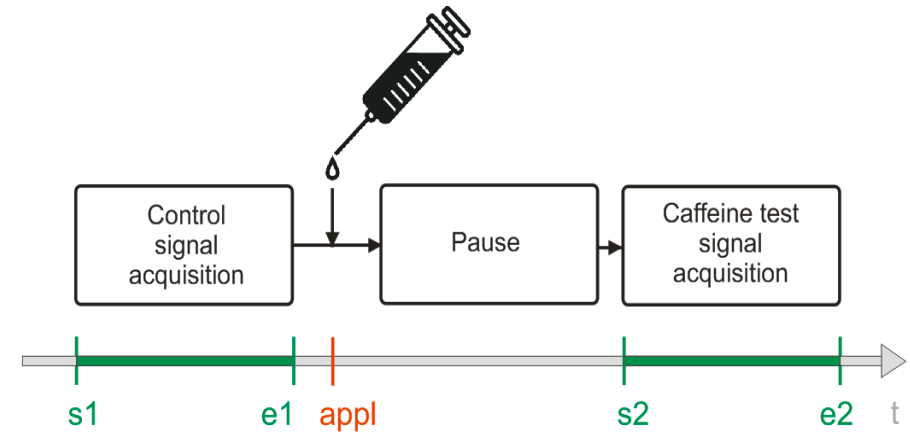
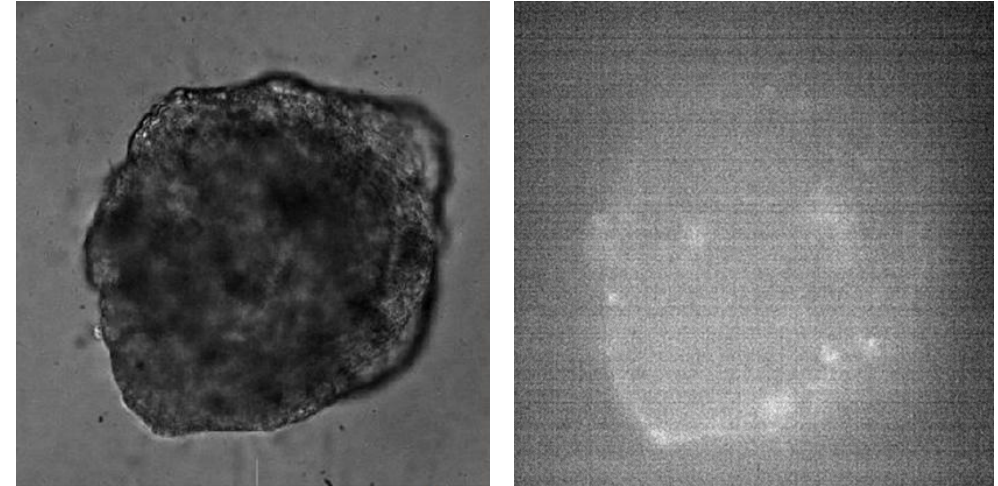
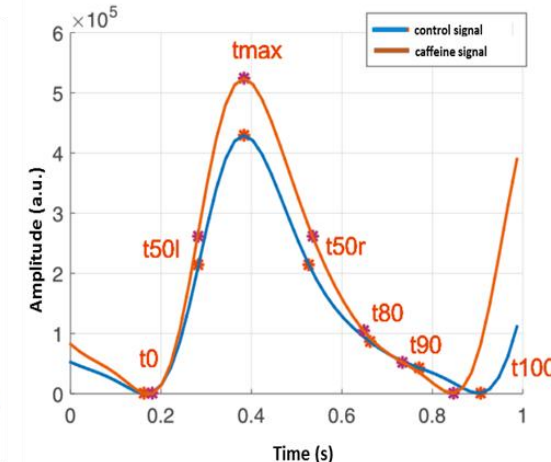
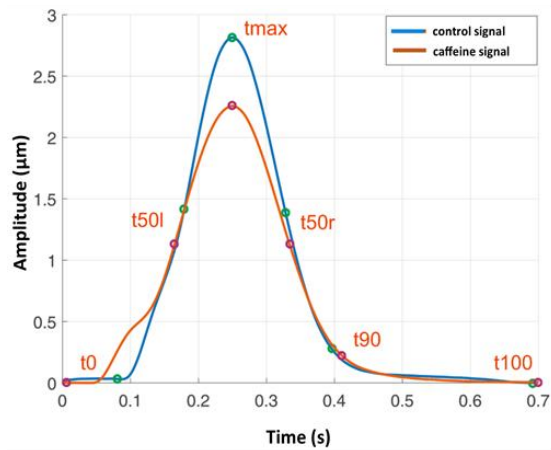
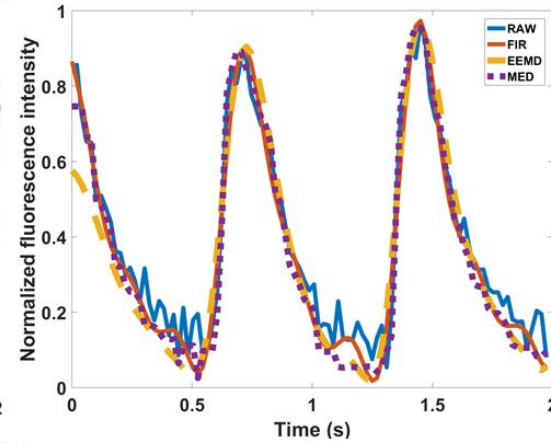
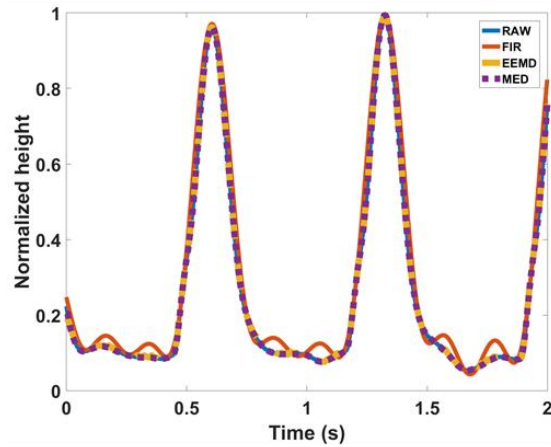
ECC monitoring – 3D models



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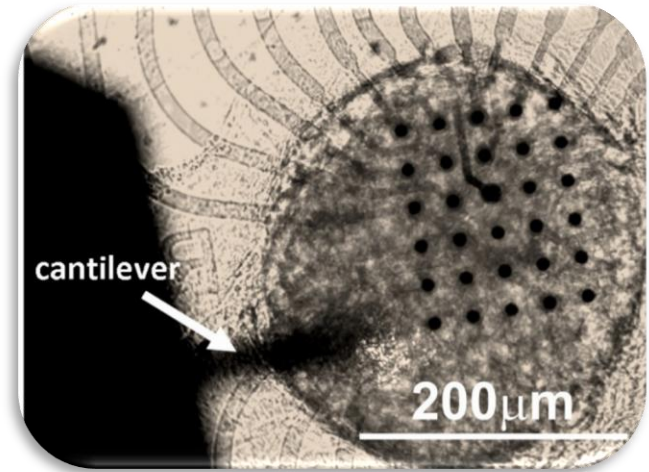
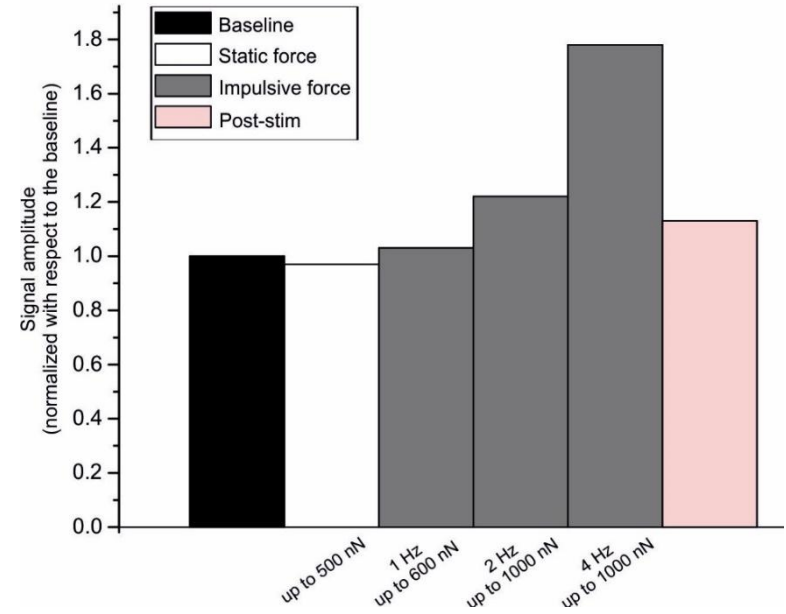
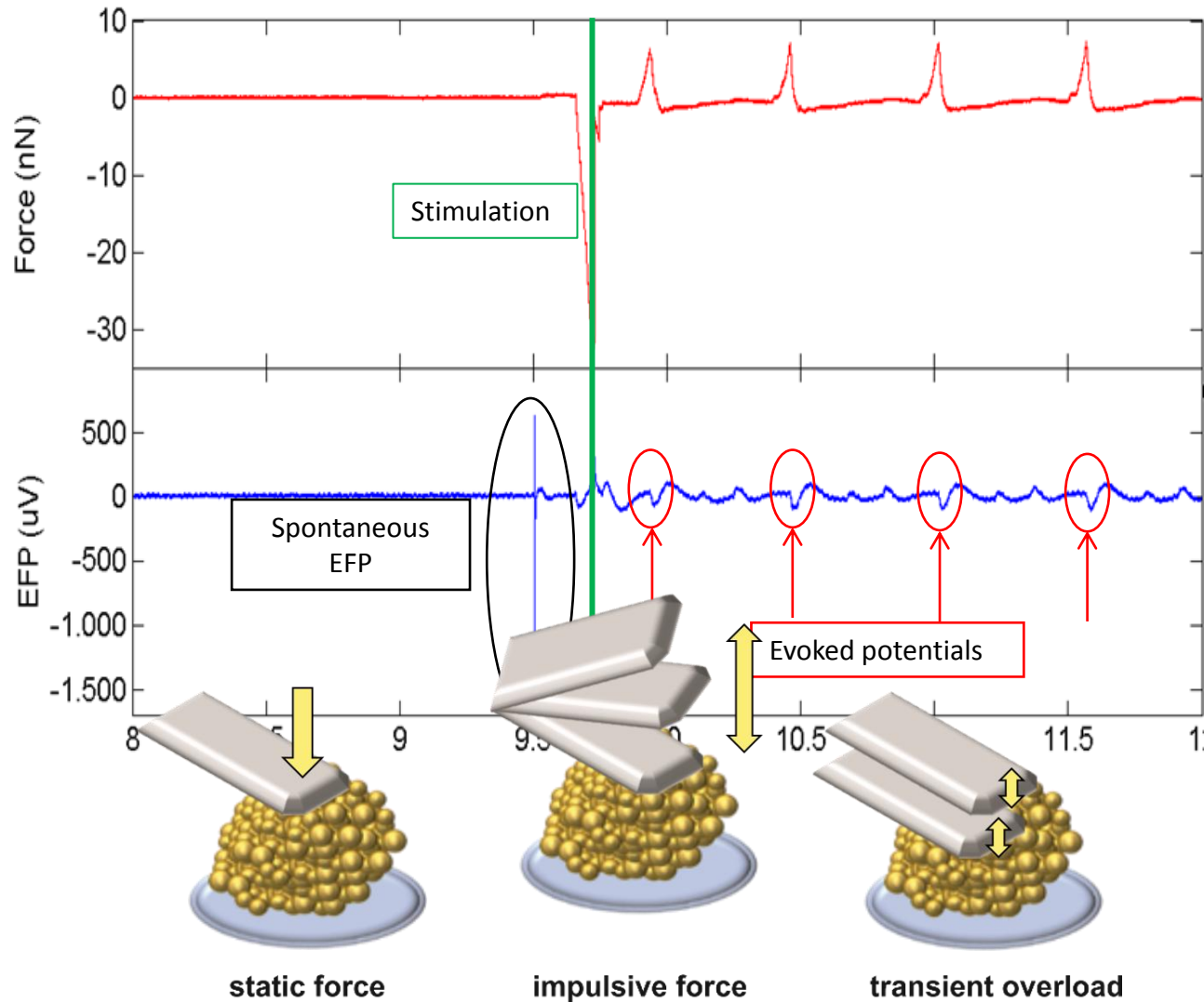


ECC monitoring – 3D models



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Mechanoelectrical feedback and arrhythmia





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