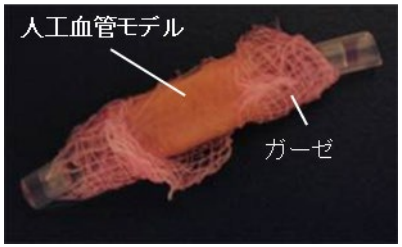
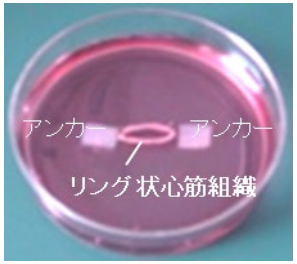
Stem Cell Differentiation and Regenerative Tissue Construction with Natural Biomaterials

Professor Zhonggang Feng

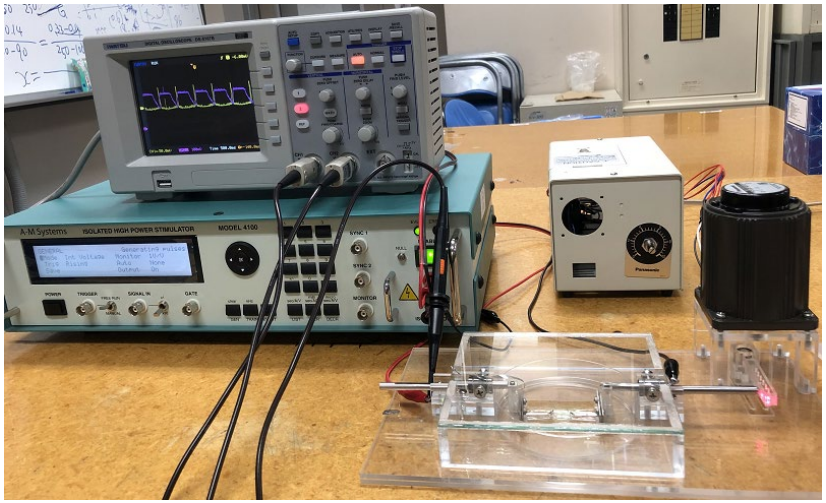
Illustration



Small-diameter blood vessel model



Regenerative cardiac ring



Electro-tensile bioreactor for the culture of regenerative cardiac tissue in a conventional CO_2 incubator

Content:

Efficient differentiation from stem cells into high-quality functional cells is essential for regenerative medicine. It is known that the biochemical and biophysical factors are critical to the differentiation. One major project at the lab is to differentiate human iPS cells (hiPSC) into heart cells. We take advantages of the cardiac extracellular matrix (cECM) to make cell culture substrate eyeing on the beneficial biochemical composition in cECM for the cardiac differentiation. Furthermore, we create favorable biophysical environment for the cardiac differentiation by developing a novel electro-tensile bioreactor. In addition, we are attempting to create an architecture in which flexible conductive tracts between atrial and ventricular cells can propagate, producing a new heart model.

Appealing point:

Collaboration is key to my research. I have been collaborating with professors and experts in medical science and biomechanics. I could contribute my skill and knowledge in experimental and theoretical research and in device and novel biomaterial development. I am also looking forward to industry-academia collaboration.

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