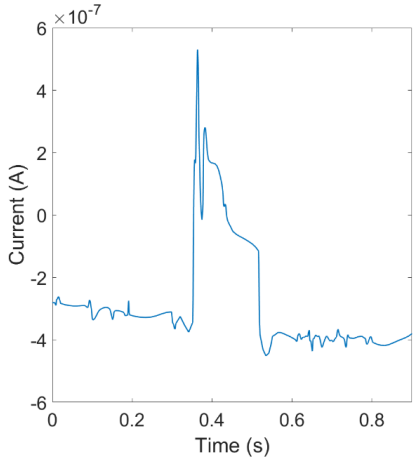
Sensing Cardiomyocytes on Electrolyte-Gated Organic Field-Effect Transistors

(a)



(b)

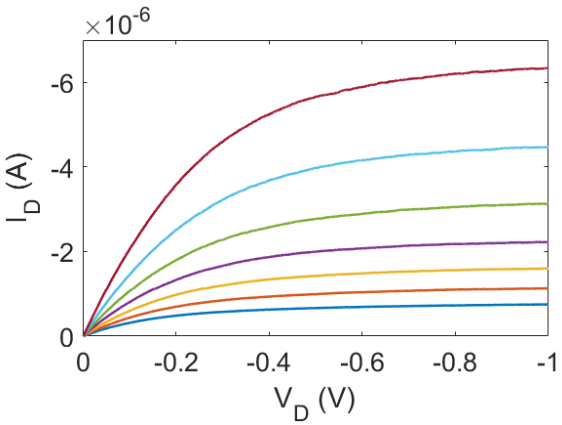


Figure: (a) Measured cardiomyocyte pulse (b) electrolyte-gated transistor output characteristics.

Objective

➢ To precisely measure the electrical activity of cardiomyocytes by placing them directly onto organic thin-film transistors

Impact

With an applied voltage, ions in an electrolyte form an electrical double layers at organic semiconductor interface. Electrolytes can therefore be used as gates for organic thin film transistors (OTFTs). OTFTs are precise sensors, as small changes in the gate voltage correspond to large changes in the drain current. By placing cardiomyocytes on OTFT arrays, we measure the electrical activity of *in vitro* cardiac tissue.

Facilities and Methods Used

- E-beam and thermal evaporation chambers
- Lurie Nanofabrication Facility for lithography and imaging
- Frankel Cardiovascular Center for work with cardiomyocytes

Relevant Papers

- Horowitz, et al., *Langmuir,* DOI: 10.1021/acs.langmuir.0c03319

Funding

- Universal Display Corporation

Collaborators

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