



The spatial and temporal analysis of biosystems at the nanoscale is essential towards improving diagnosis, directing assembly and targeting drug delivery in medicine. Our research seeks to develop biomedical materials, devices and instrumentation for applications in biosensing, neuroengineering, and integrative tissue regeneration. We focus on soft lithography based nano/microfluidic device engineering for spatially localized assembly and temporally resolved signal transduction at the nano/bio interface. We apply these capabilities towards the development of diagnostic strategies, such as biomarker discovery for early detection of cancer, neurodegenerative diseases, and the control of infections, as well as therapeutic strategies including the isolation of tumor initiating cells for targeted drug development, separation of stem cell lineages for transplants and electrical stimulation to mitigate neurological disorders and affect muscle regeneration.

Electro-driven Biosystems

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“Charging bio-interfaces for nanoscale manipulation”

