

## Non-Genetic “Optogenetics”:

### Silicon Based Bio-Interfaces for Multi-scale Optical Modulation

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Silicon based micro- and nanostructures are widely used for many biomedical applications due to their biocompatibility and tunable electrical and mechanical properties. As such, their ability to transduce optical illumination to electrical current made them a potential candidate for nongenetic optical modulation. In this talk, I will present our recent studies of developing new approaches for bio-interfaces using silicon micro- and nanostructures for non-genetic optical modulation, spanning from sub cellular interrogation with extremely high spatial resolutions to whole organ optical modulation. These materials can help answer fundamental question in bioelectrical basic research, as well as open new opportunities for biomedical application such as cardiac pacing and neurogenerative treatments.

