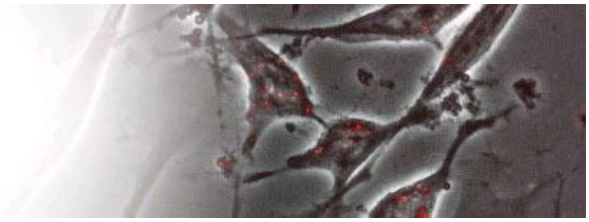
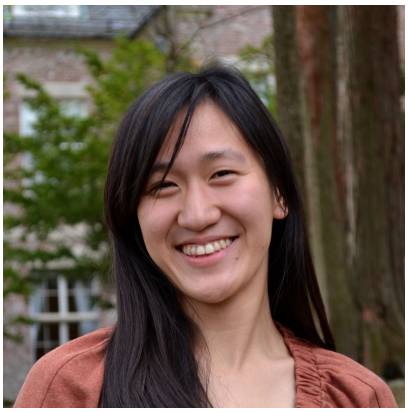
UCLA Engineering

Chemical and Biomolecular Engineering



SEMINARS IN CHEMICAL AND BIOMOLECULAR ENGINEERING



Friday, Feb. 08, 2019
10:00am - 11:00am
Boelter Hall 3400

Alina Rwei

Postdoctoral Scholar
Chemical Engineering | Materials Science and Engineering
Northwestern University

"Shedding Light on Pain Therapeutics: From Externally-Triggerable Drug Delivery Systems to Bioelectronics"

Current treatments of pain heavily rely on opioids, resulting in significant side effects such as addiction, tolerance, leading to the Opioid Overdose Crisis as we know of today. Smart drug delivery systems may provide an effective solution. Here I present the development of externally-triggerable drug delivery systems for on-demand, repeatable and adjustable local anesthesia, where the timing, duration, and intensity of nerve block can be controlled through external energy triggers such as light and ultrasound. In addition to traditional pharmacological approaches, bioelectronic platforms to enhance our insights into the diagnostics and mechanisms of pain and will also be discussed. Through pharmacological, optical, and electrical toolsets, we aim to develop effective therapeutic solutions to neurological disease states.

Dr. Rwei received both her undergraduate and Ph.D. degrees at the Massachusetts Institute of Technology (MIT), with her undergraduate degree in Chemical Engineering and Ph.D. degree in Materials Science and Engineering, completed in June 2017. Her Ph.D. training was conducted under the supervision of Professor Robert Langer at MIT and Professor Daniel Kohane at Harvard Medical School. Her thesis, titled “Externally Triggerable Drug Delivery Systems for On-Demand Nerve Block,” focused on the design and development of light- and ultrasound- triggerable drug delivery systems for repeatable and adjustable release of local anesthetics. Her experience has yielded publications in high-impact journals including Nature Biomedical Engineering, Proceedings of the National Academy of Sciences (PNAS), Nano Letters, and Journal of Controlled Release. She is now a postdoctoral scholar in Professor John Rogers’ lab at Northwestern University. She is the recipient of the Postdoctoral Fellowship Research Training Award (TL1) from the Clinical and Translational Science Awards Program by NIH/NCATS.