



UCSD NANOENGINEERING FACULTY SEMINAR

Wednesday
November 7, 2018

Seminar Presentation: 3:00pm-4:00pm

SME 248 – ASML Conference Center

Polymer Engineering with Proteins and Peptides for Biomedicine

Dr. Jonathan Pokorski, Associate Professor
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Abstract: Projects in the Pokorski lab will be described detailing work ranging from the macro-scale to the molecular scale. These projects utilize polymer processing and synthetic chemistry to fabricate or synthesize biologically relevant materials. One example, will describe melt-processing of several protein candidates and the effect on macromolecular structure and enzymatic activity of the processed proteins. The primary focus of this portion on the seminar will be a discussion of virus like nanoparticles (VLPs) derived from bacteriophage Q β , which is a combinatorial vaccine platform. Melt processing conditions, physical models of processing, and biological data will be described in which Q β is processed into slow-release depot delivery formulations. In another example, chemistry to form protein-polymer conjugates will be described. New methods to synthesize these materials are critical to the development of biopharmaceuticals, since polymer conjugation elicits extreme pharmacokinetic advantages. The current gold-standard, PEGylation, is outdated and potentially dangerous. This portion of the talk will describe ring-opening metathesis polymerization methods to develop the next-generation of protein-polymer conjugates. Lastly, I will briefly describe where the lab research is going at UCSD in the hopes of inspiring collaborative discussion!

Biosketch: Professor Pokorski began his scientific career by earning his B.S. in biochemistry from UCLA in 2002. While at UCLA, he worked in private industry designing and testing biomedical devices that are currently in use globally. In 2007, Dr. Pokorski received his doctoral degree in organic chemistry from Northwestern University, where he designed, synthesized, and tested diverse peptidomimetic systems for use in medical diagnostics and therapeutics. Dr. Pokorski then moved to The Scripps Research Institute, where he used both chemical and genetic engineering of viral nanoparticles to synthesize novel drug delivery systems. During postdoctoral training, Dr. Pokorski first earned a NIH Ruth Kirschstein fellowship and later secured an NIH Pathway to Independence Award. Dr. Pokorski's joined the faculty at Case Western Reserve university in the department of Macromolecular Science and Engineering in 2012 and recently moved to UCSD in the department of NanoEngineering. Pokorski's laboratory works to bridge chemical synthesis, molecular biology, and materials science to make new materials for biomedical applications. The Pokorski lab is particularly interested in marrying protein and polymer science to generate new materials for drug delivery, imaging, and vaccination. Research in the Pokorski lab is funded through grants from the National Institutes of Health, National Science Foundation, and the American Chemical Society. He has been awarded several prestigious awards, including a 2013 ACS PRF New Investigator Award and, in 2016, he was elected a Kavli Fellow.