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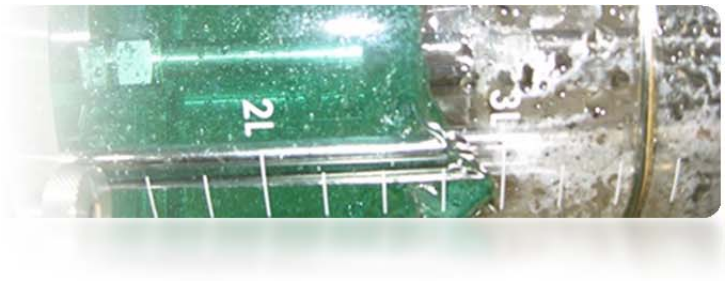
Chemical and Biomolecular Engineering



SEMINARS IN CHEMICAL AND BIOMOLECULAR ENGINEERING

Friday, April 29, 2016 10:00AM

PENTHOUSE → BH8500

Presented by

Prof. David Schaffer

Professor of Chemical and Environmental Engineering, Bioengineering, Molecular and Cell Biology, and the Helen Wills Institute of Neuroscience,

University of California, Berkeley

Hosted By:

Prof. Yvonne Chen

"Directed Evolution of New Viruses for Therapeutic Gene Delivery"

Gene therapy has experienced an increasing number of successful human clinical trials, particularly ones using adeno-associated viral (AAV) vectors. However, natural viruses face many delivery barriers that limit efficacy, not surprisingly as nature did not evolve them for our convenience to use as human therapeutics. In most situations there is insufficient mechanistic knowledge of complex virus structure-function relationships to empower rational design to improve these vectors. However, we have developed directed vector evolution – the iterative genetic diversification of a viral genome and functional selection for desired properties – as a general approach to engineer new viruses that meet human therapeutic needs. We have been implementing this approach to engineer novel AAV variants for evasion of immune responses, enhanced biodistribution, tissue distribution, targeted delivery, and enhanced delivery efficiency to a range of tissues and cells, including in models of human disease. The resulting, optimized viruses have thus been engineered to meet human therapeutic needs.

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David Schaffer *is a Professor of Chemical and Biomolecular Engineering, Bioengineering, and Neuroscience at University of California, Berkeley, where he also serves as the Director of the Berkeley Stem Cell Center. He received a B.S. in Chemical Engineering from Stanford University in 1993 and a Ph.D. in Chemical Engineering from the Massachusetts Institute of Technology in 1998. He then conducted a postdoctoral fellowship at the Salk Institute for Biological Studies in La Jolla, CA before becoming a faculty member at the University of California at Berkeley in 1999. At Berkeley, Dr. Schaffer applies engineering principles to enhance stem cell and gene therapy approaches for neuroregeneration, work that includes novel approaches for molecular engineering and evolution of new viral vectors as well as new technologies to investigate and control stem cell fate decisions. David Schaffer has received an NSF CAREER Award, Office of Naval Research Young Investigator Award, Whitaker Foundation Young Investigator Award, and was named a Technology Review Top 100 Innovator. He was also awarded the American Chemical Society Marvin Johnson Award in 2016, the American Chemical Society BIOT Division Young Investigator Award in 2006, the Biomedical Engineering Society Rita Shaffer Young Investigator Award in 2000, and was inducted into the College of Fellows of the American Institute of Medical and Biological Engineering in 2010.*