

Phage panning, peptides and polymers: Targeted drug delivery using peptide ligands identified by phage display

Phage display is a powerful tool for identifying novel peptide-based targeting ligands for targeted delivery. In a first example, multivalent polymer displaying a fibrin-binding peptide was synthesized by controlled radical polymerization. The resulting polymer incorporates into forming clots and increases clot strength while improving resistance to clot lysis. Delivery of this polymer to a rat model of trauma significantly improved survival compared to controls. In a second example, cell-based phage display was used to identify a new peptide that targets anti-inflammatory macrophage. This peptide was used to reduce populations of tumor-associated macrophage in vivo, resulting in improved survival. Finally, a peptide that traffics to the central nervous system via retrograde transport was identified by in vivo phage display and used to deliver active enzymes to motor neurons in the spinal cord.

Biography:

Suzie H. Pun is the Robert F Rushmer Professor of Bioengineering, an Adjunct Professor of Chemical Engineering, and a member of the Molecular Engineering and Sciences Institute at UW. She is a fellow of the National Academy of Inventors (NAI) and American Institute of Medical and Biological Engineering (AIMBE), and has been recognized with MIT Technology Review's "Top 100 Young Innovators" designation, the Presidential Early Career Award for Scientists and Engineers in 2006, the 2014 Young Investigator Award from the Controlled Release Society, and as an AAAS-Lemelson Invention Ambassador in 2015. She serves as an Associate Editor for *ACS Biomaterials Science and Engineering*. Her research focus area is in biomaterials and drug delivery.

Suzie Pun received her B.S. in Chemical Engineering from Stanford University and her Ph.D. in Chemical Engineering from the California Institute of Technology. She also worked as a senior scientist at Insert Therapeutics/Calando Pharmaceuticals developing polymeric drug delivery systems before joining the Department of Bioengineering at University of Washington.