



## Life Engineering Symposium

University of California, San Francisco, Mission Bay Campus - August 19-20, 2005

### *Synthetic Eukaryotic Cells / Stem Cells*

#### *Prediction and Design of Specificity in Protein-Protein Interactions*

Tanja Kortemme

Assistant Professor, Department of Biopharmaceutical Sciences  
University of California, San Francisco

#### **Abstract:**

Research in our group combines computational and experimental approaches for modeling and design of protein-mediated interactions and networks. As a first step towards altering molecular recognition processes in a predictive and tunable manner, we have developed a computational all-atom model, which has been successfully applied to the experimental design of new protein interfaces. For example, the design of a new domain-domain interface generated by fusing domains from distantly related proteins resulted in the creation of an artificial DNA cleaving enzyme. More recently, we have developed a systematic computational approach for the redesign of protein interaction specificity. A proof-of-concept test of this procedure generated new protein pairs that are functional and specific in vivo.