351e FPBE Award Lecture: New Technologies for Protein Engineering and Proteomic Analyses

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Over the last 15 years, our lab has developed a number of technologies for the engineering of binding proteins and catalysts. The most recent example of such a technology is a quantitative 2-hybrid technique, termed APex 2 hybrid, suitable for the isolation of interacting protein pairs expressed in bacteria. Unlike other protein interaction detection technologies, APEx 2 hybrid uses fluorescence as the readout, is suitable for secreted proteins and allows the rank-ordering of interacting proteins on the basis of their dissociation rate constant. In parallel, we have developed two other powerful protein engineering methods that promise to great expand our ability to engineer new proteins for therapeutic and diagnostic applications: (1) Isolation of novel binding proteins by capitalizing on the bacterial Tat pathway; (ii) Combinatorial enzyme humanization. Examples highlighting the utility of these platform technologies will be presented.