Tony Kossiakoff
Department of Biochemistry and Molecular Biology
University of Chicago

« Modifying biological function using conformational trapping by customized synthetic antibodies »

Synthetic Antigen Binders (sABs) are a class of customized antibody-based reagents generated using novel phage display libraries and selection strategies. Their attributes provide for the ability to generate sABs that are engineered to: 1) target specific regions on the surface of the protein, 2) recognize specific conformational or oligomeric states, 3) induce conformational changes, and 4) capture and stabilize multi-protein complexes.

As a demonstration of the approach, we have generated a set of sABs that can effectively tune the cross reactivity of cell surface receptors and others that have been tailored to induce conformational changes in the targeted protein that significantly alters its biology. Methods have been developed to internalize the sABs into live cells in a fully functional form where they can affect the function of their cytoplasmic targets. Additionally, they have been used as structural “chaperones” to promote crystallization of recalcitrant macromolecular systems and as fiducial marks to assist Cryo-EM analyses.