**Modifying biological function using conformational trapping by in vitro evolved 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 F-actin filaments that substantially alter actin cytoskeletal structure by mechanisms involving depolymerizing, severing, bundling and capping of actin filaments. In another example, we show that conformational-specific sABs can selectively capture either the open (apo-) or closed (ligand bound) conformational states of maltose binding protein to dramatically influence the equilibrium of ligand binding.

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