**Research Objective**

- Integrated biocombinatorial and a priors in silico approach, for on-demand discovery of robust peptide reagents (in response to new threats)

- Unprecedented design control and performance for synthetic capture materials in complex environments through a combination of epitope targeting and iterative screening catalyzed by the target itself

  - Affinity and selectivity comparable to monoclonal antibodies (pM-nM)
  - Zero batch-to-batch variability
  - Scale up through robotic methods
  - Amenable for integration into any detection platform
  - Can be synthesized as linear and cyclic
  - Use of non-natural amino acids for improved chemical stability & function
  - Extreme chemical and thermal stability
  - Epitope targeting for site specific inactivation or paired reagent development

**Related ARL Publications/Patents**


**ARL Facilities and Capabilities Available to Support Collaborative Research**

- Expertise for discovery, development and evaluation of extremely stable (protease resistant, extreme thermostability), and highly manufacturable peptide reagents for diagnostics, biosensing, etc.

- Titan 357 split-and-mix automated peptide instrument for preparing combinatorial libraries of natural and non-natural peptides for high throughput screening.

- Characterization methodologies include Biacore surface plasmon resonance (SPR) and Luminex multiplex assays

- Specialized modeling and simulation tools for bio-bio interactions (*a priori*), using secure DOD High Performance Computing Facilities

**Complementary Expertise / Facilities / Capabilities Sought in Collaboration**

- Postdoctoral researchers, students, and visiting scientists to collaborate in area of microfluidics for semi-automated bead/library sorting

- Potential collaborations in defense diagnostics and sensing platforms; partnerships in wearable/smart skin/fabrics/devices and other applications

**Cyclic peptide exhibits almost 2X improvement (right) over linear biligand (left). Over a 10X increase in MFI signal with the cyclic peptide, improving the limit of detection for the reagent.**