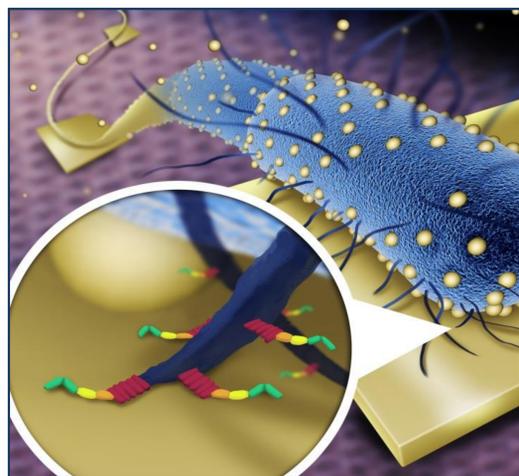


S&T Campaign: Materials Research Biological and Bio-inspired Technology from Biological Systems

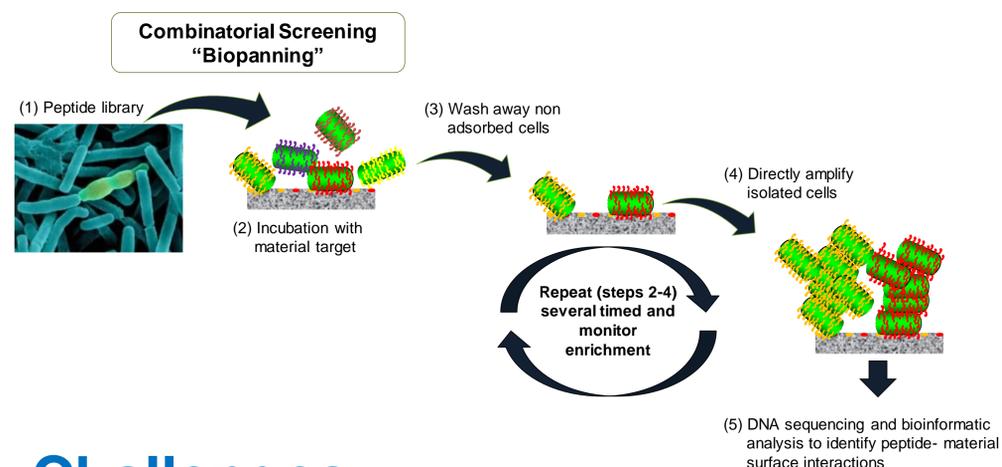
Dr. Dimitra Stratis-Cullum
(301) 394-0794
dimitra.n.stratis-cullum.civ@mail.mil

Research Objective

- Develop comprehensive experiment and computational discovery tools for peptide-directed hard-soft (i.e., bio/abio) Interfaces

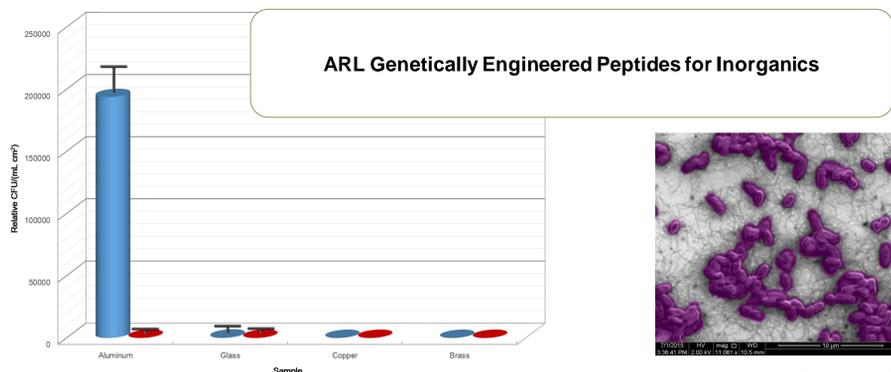


Conceptual diagram of living bio-hybrid interface

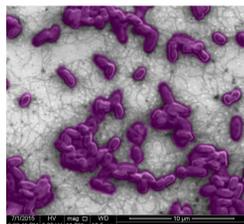


Challenges

- Understanding structure-function relationships originating from complex, multi-mode interactions
- Next generation tools for study and discovery of bio-hybrid materials under Army-relevant environments
- Discovery of selective peptide and peptide-directed bacterial systems for programmable bio/abio interfaces



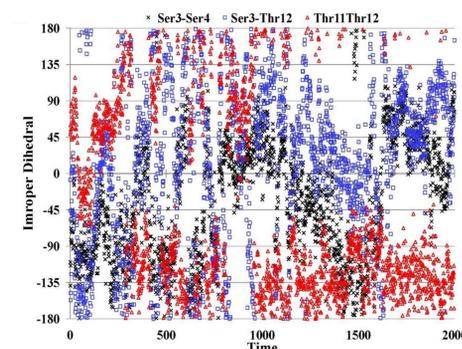
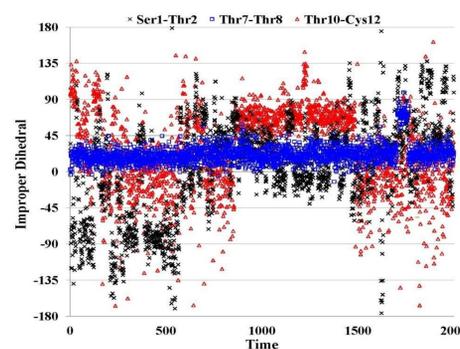
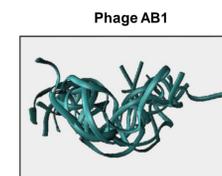
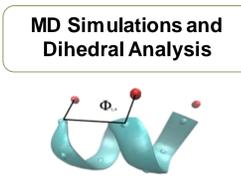
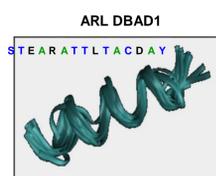
Selectivity study



Living (peptide-directed) interface

ARL Facilities and Capabilities Available to Support Collaborative Research

- Facilities & expertise for discovery, custom engineering, and study of peptides via bacterial cell surface display
- Specialized modeling and simulation tools for bio-bio and bio-abio interactions including using secure DOD High Performance Computing Facilities



Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- Postdoctoral researcher(s), students, visiting scientist opportunities
- Biofilm expertise and device/microfluidic expertise to collaborate on switchable cell adhesion studies
- Potential collaborations in living materials (e.g., living paints, anti-corrosives, self-healing materials)
- Potential collaborations with researchers with complementary experimental/computational tools for studying bio/abio interfaces

Recent Related ARL Publications

- "Genetically Engineered Peptides for Inorganics: Study of an Unconstrained Bacterial Display Technology and Bulk Aluminum Alloy" *Adv. Mater.*, **2013**, 25 (33), 4530.
- "Selective preference of engineered peptides for aluminum alloy," *Emerging Materials Research*, **2015** Vol 4 (2), 297-310. June 2015
- "METHOD AND USE FOR SURFACE DISPLAY OF PROTEINS AND PEPTIDE DERIVATIVES IN A BACTERIAL THERMOPHILE" filed on: **8/28/2015**, S/N 14/838,392