

NATICK BIOTECHNOLOGY MISSION

Advance the state-of-the-art in biotechnology through fundamental and applied research of novel biomaterials/processes to enhance Warfighter protection, welfare, and survivability

KEY EXPERTISE

- Biomaterials
- Protein Chemistry
- Self Assembly
- Nano-bio Interfaces
- Biorecognition
- Electrospinning
- Bioenergy

CORE CAPABILITIES

- Molecular Biology
- Imaging and Microscopy
- Biophysical Characterization
- Biofermentation
- Bioanalytical and Synthetic Lab
- Antimicrobial, Antisporal, & Antifungal Testing and Evaluation



US ARMY NSRDEC WARFIGHTER SCIENCE, TECHNOLOGY & APPLIED RESEARCH DIRECTORATE Materials & Defense Sciences Division

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BIOTECHNOLOGY FOR THE WARFIGHTER

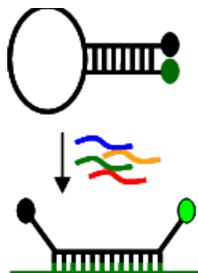
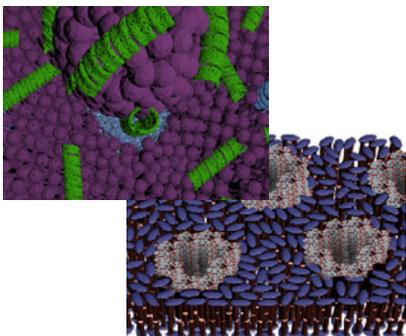
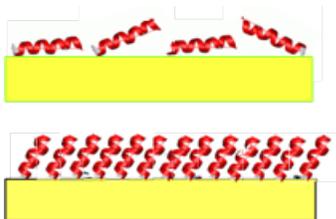
Biological Science & Technology Team



BIOTECHNOLOGY FOR THE WARFIGHTER

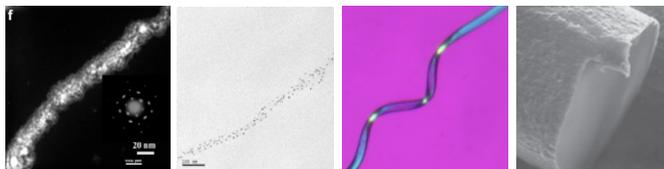
DETECTION & DECONTAMINATION

- Structural determination of immobilized antimicrobial peptides
- Antimicrobial peptide arrays for pathogen detection
- Investigating the lysis mechanism of immobilized biological biocides
- A novel first step approach for inactivating the onerous bacterial spore
- Biocorrosive resistant coatings incorporating antimicrobial peptides into polymers
- Fluorescently-labeled peptides for enhanced sensitivity in food pathogen biosensors
- Signal amplifying polymers and molecular beacons for the direct detection and discrimination of DNA sequences
- Optical phenomena of biomolecule-nanocrystal complexes



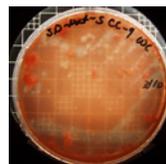
SELF-ASSEMBLY

- Direct nanopatterning of bacteriophage using dip-pen nanolithography
- Phage-based fibers for directed self-assembly of functional nanomaterials
- Aqueous spinning of recombinant spider silk



BIO-ACTIVE FOOD INGREDIENTS

- Improved dietary fiber digestion in the large intestine through the selection of "Fibro-biotics"
- Understanding prebiotic and probiotic interactions through fermentation processes



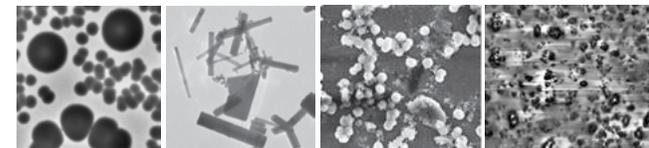
BIOENERGY

- Novel bacterial isolates that preferentially hydrolyze crystalline cellulose: a potential breakthrough for biofuel research



ADVANCED COATINGS/MATERIALS

- Improvement and stabilization of electro-optical properties of nanocrystalline ZnO
- Formation of titania using a biomimetic-derived method
- Novel organic-inorganic hybrid polyborosiloxanes
- Polysiloxane nanocomposites for environmental and human safe flame-retardant materials
- Stable, multifunctional and reactive textile coatings



TESTING & EVALUATION

- Soil burial – AATCC 30-1993
- Standardized antimicrobial testing
 - AATCC 100
 - AATCC 147
 - ASTM E-2149-01
- Spore and viral aerosol testing
- Bioaerosol testing

