Fieldable MALDI TOF BW Agent Sensor System

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Special Projects Office

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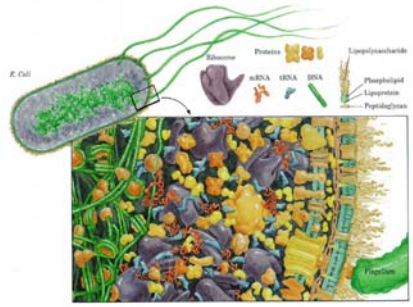
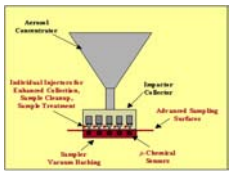
Goal: Develop fieldable prototype sensor for detection of BW agents



1. Bacteria, Viruses and Toxins contain complex mixture of lipids, carbohydrates, proteins and nucleic acids

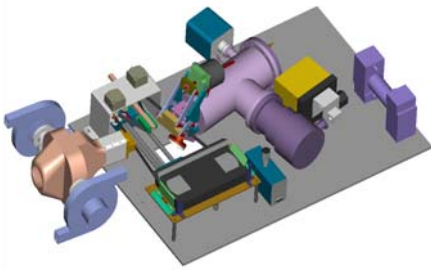
Sample Processing Module



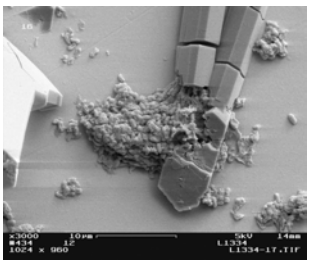
Linear Array of TOF Mass Spectrometers

4. Innovations

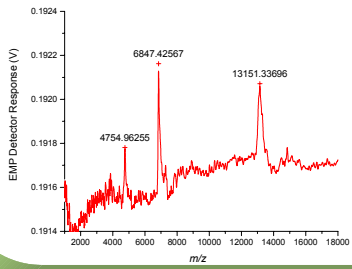
- Advanced sample handling and processing system
- Arrayed mass spec for parallel and interrogation of different classes of agents



MALDI* TOF Mass Spectrometer



2. High resolution mass spectra of micro-organisms from MALDI crystals



Fingerprints

- Features extracted from MALDI-TOF spectra
- Template matching
- Hypothesis testing

3. Detection Algorithms

- Matched filters
- Bayesian Networks

Proteomics

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MPLHNLTRFP
RLEFIGAPTP
LEYLPRFSDY
LGREIFIKRD
DVTPMAMGGN
KLRKLEFLAA
```

- Features computed from protein sequences
- Statistical inference
- Machine learning

* Matrix-Assisted Laser Desorption/Ionization