National Defense Industrial Association (NDIA) CBRN Division Quarterly Event: Medical Portfolio

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Joint Science and Technology Office for Chemical and Biological Defense

Defense Threat Reduction Agency

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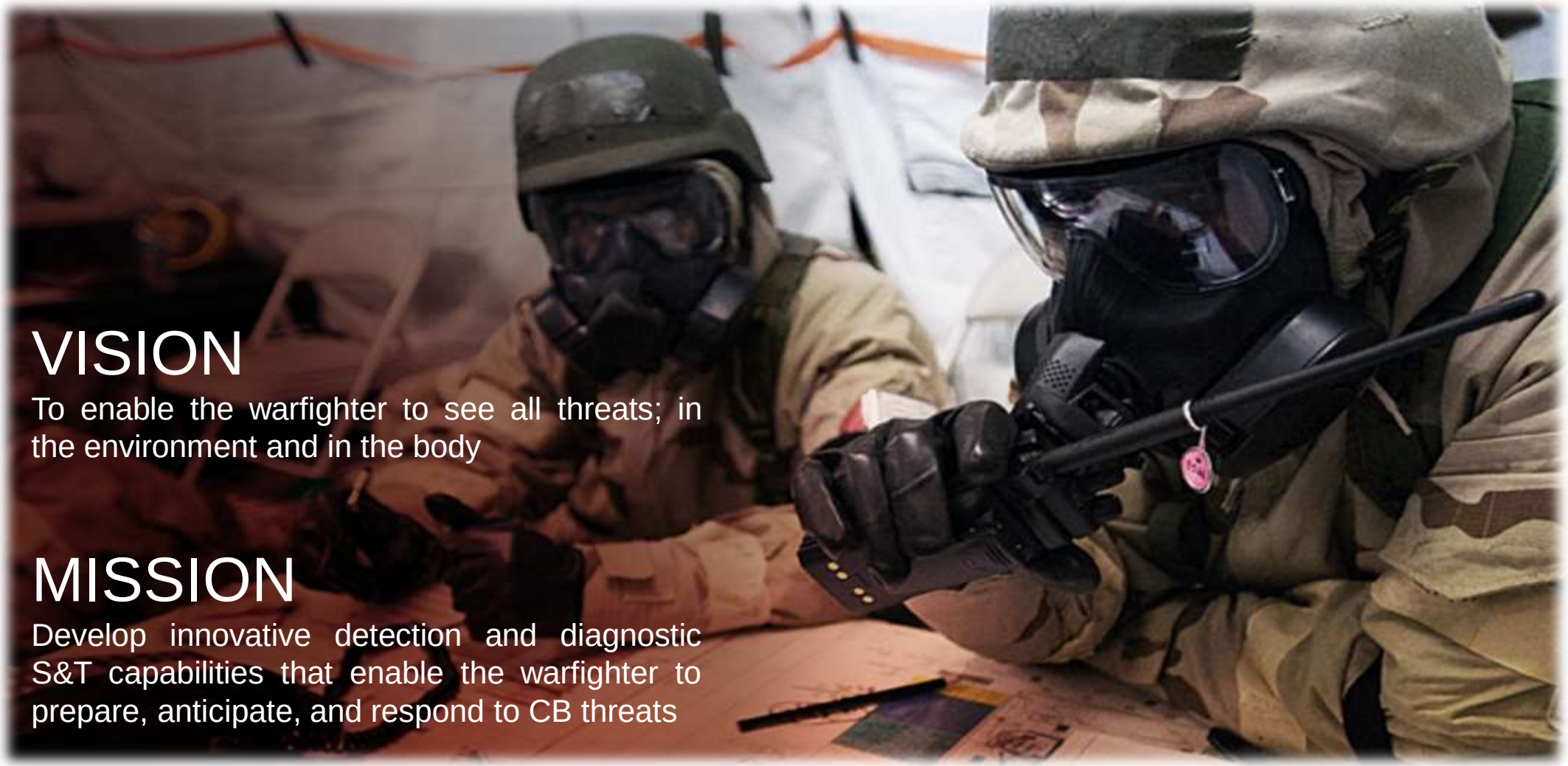
RD-CBA Mission & Objectives



VISION

To enable the warfighter to see all threats; in the environment and in the body

MISSION

Develop innovative detection and diagnostic S&T capabilities that enable the warfighter to prepare, anticipate, and respond to CB threats

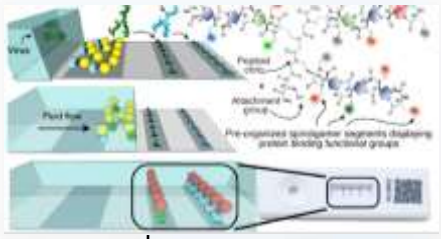
Overview of Diagnostics

Develop novel and innovative diagnostic technologies that are rapid, sensitive, and specific for earliest diagnosis of Warfighter exposure.

- Get the warfighter the right tool, where it is needed.
- Address emerging threats with the latest technologies.
- Work with partners and stakeholders to provide the best value.

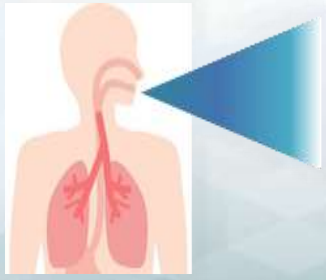
Diagnostics Portfolio Highlights

NGDS 2
ChemDx



Synthetic Affinity Reagents for Diagnostics

Toxin Sensing

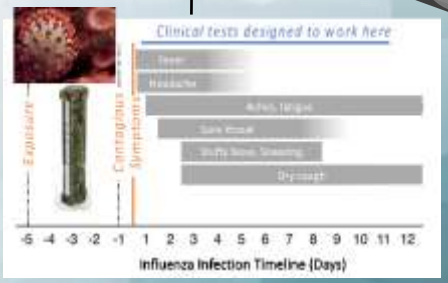


Minimally Invasive Testing Methods

MeMed

Bacterial vs. Viral for MPDS

FY21 FY22 FY23 FY24 FY25 FY26 FY27



POC Device for Pre-symptomatic Diagnosis

Wearables Disease Diagnostic for CB exposure

Present & Future Directions

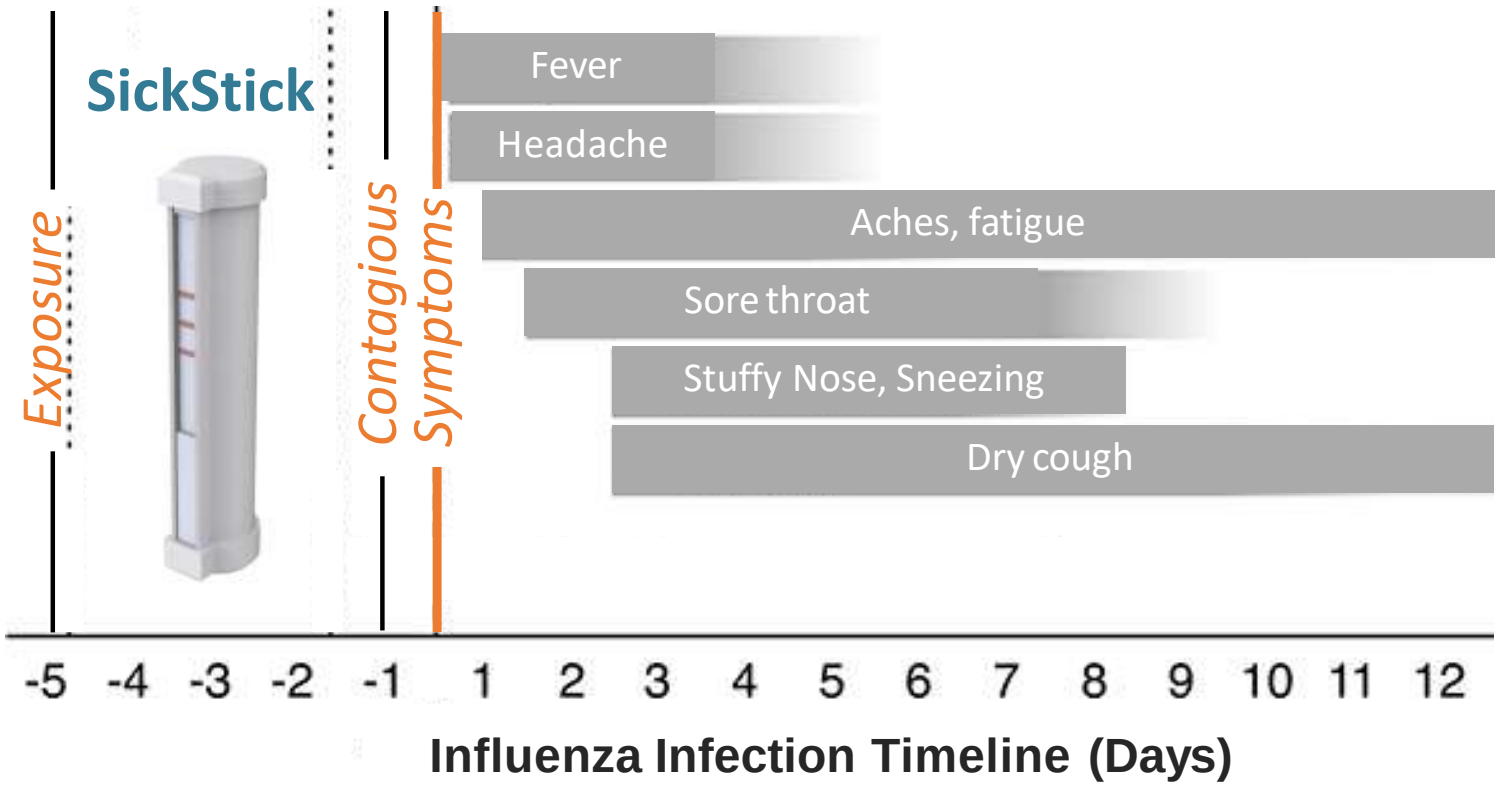
- Deliver actionable diagnostic information at the point of care
- Address emerging threats with the latest technologies
- Push beyond the boundaries of the traditional threat list

Pre-Symptomatic Diagnosis

Goal: Develop a testing method that enables identification of infection prior to disease onset and transmission of illness.

- Testing that reads a general immune response, rather than being tuned to specific pathogens.
- Patients testing positive on such a test then follow up with the traditional genomic testing to confirm the identity of the infectious agent and seek the appropriate treatment.
- Large-scale testing can be done for groups anticipating prolonged close contact to remove infected individuals.

Knows You're Sick Before You Do



Key innovations:

- **Pathogen agnostic:** Detection of host RNA biomarkers
- **Non-invasive:** Saliva biospecimen
- **Early detection:** Pre-symptomatic biomarkers
- **Portable:** Non-powered, handheld nucleic acid sensor (molecular thermometer)
- **Simple:** Use by untrained personnel in less than 15 minutes

Predicting Disease Severity

Goal: Develop diagnostic assays to predict severe clinical outcomes, associated with the need for hospital-based intensive care.

- Development of diagnostic tools to predict disease severity and prognosis based on various biological indicators.
- Allows medical personnel to efficiently determine if a patient may worsen and require immediate intensive care, optimizing resources and treatment.
- Optimization of medical resource allocation by predicting the course of disease and preparing for outcomes as indicated.

How Sick is the Patient?

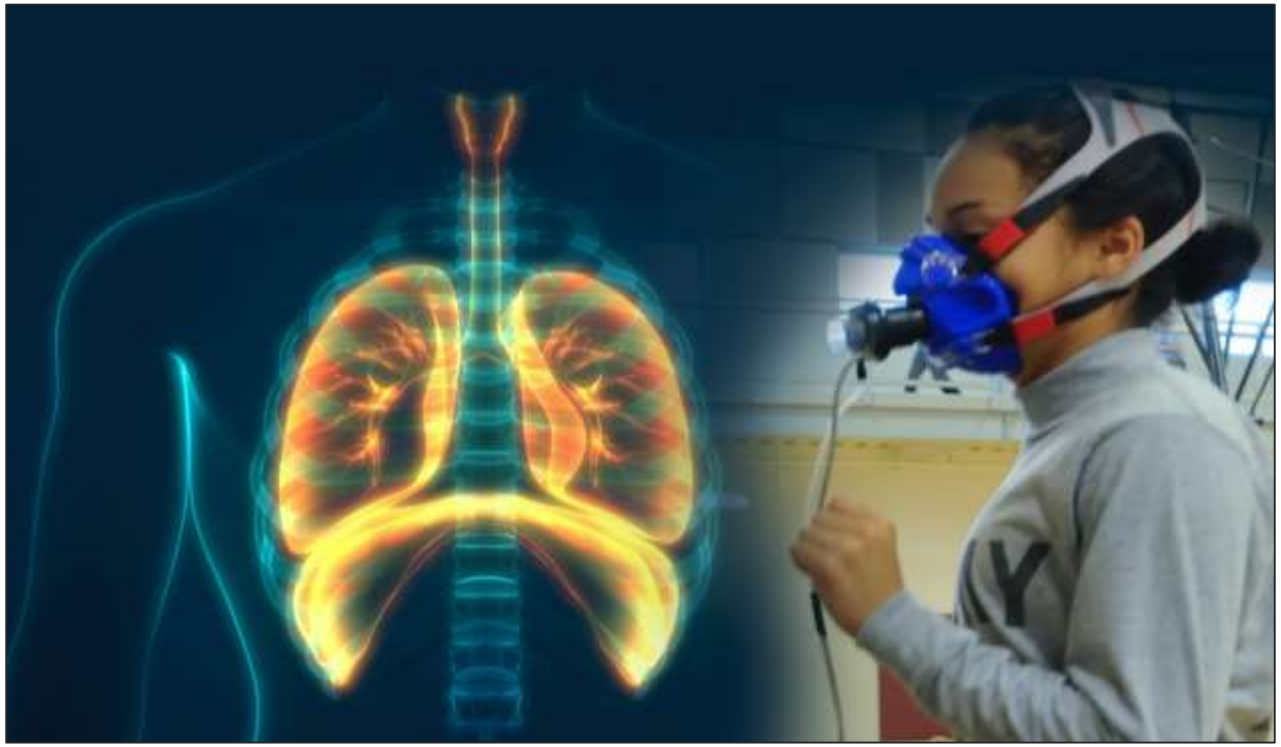
Key innovations:

- **Improved Clinical Outcomes:** Tailored treatment to minimize duration of illness
- **Triage:** Aids in resource allocation which improves overall efficiency of medical facilities
- **Data Aggregation:** Integrate results with an ecosystem of data from wearables, blood chemistry, patient vitals, and demographics
- **Risk Score:** Provides medical personnel with a metric that guides appropriate treatment

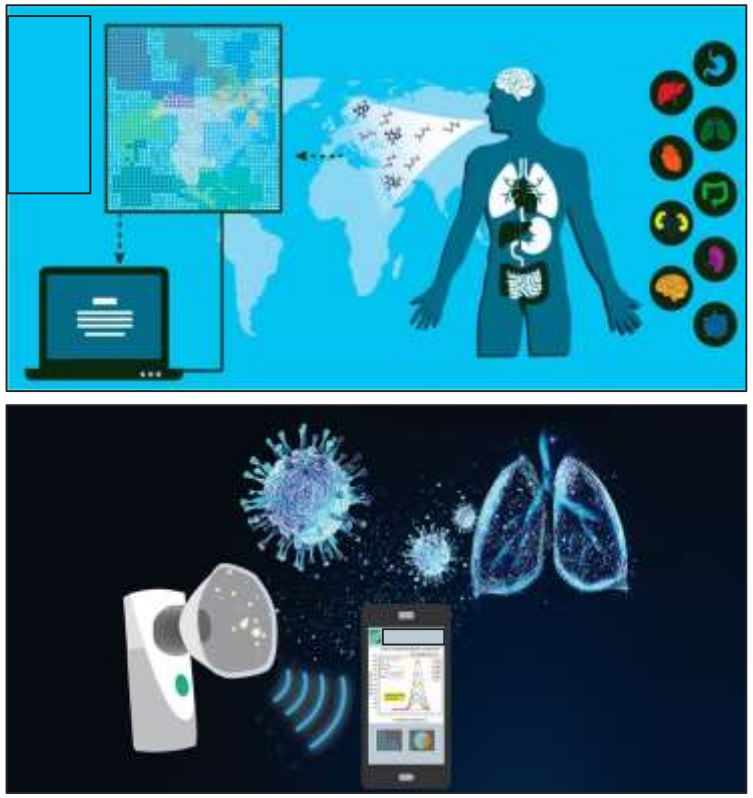
Minimally-Invasive Sampling - Breath

Goal: Develop techniques that utilize minimally- and non-invasive samples (e.g. exhaled human breath) to diagnose infection.

- Pursue novel diagnostic techniques that utilize minimally-invasive sample matrices such as exhaled breath.
- Establish foundations for breath diagnostics by understanding the breath composition of healthy populations to provide a consistent comparator.
- Apply the knowledge obtained in the healthy human baseline work and develop a breath-based, diagnostic device.



A New Approach to Testing



Key innovations:

- **Non-invasive:** Does not require needle or nasopharyngeal swabbing
- **Increased Compliance:** Approachability of the platform will increase willingness to participate in testing
- **Large-scale:** Can be used for screening of large groups
- **Ease of use:** Non-medically trained personnel can administer test

Questions?

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