Program Overview

Julie Schafer, PhD, MPH, MS
ENACT Acting Program Manager
October 30, 2018
Innovation in technologies to allow for early information to individuals and enable early action will transform healthcare and save lives.
Traditional Healthcare Paradigm: Cost of Delays

**SYMPTOMS**
- Difficult to differentiate

**DIAGNOSIS**
- Appointment with healthcare provider
- Wait at clinic or ED

**TREATMENT**
- Filling prescriptions
- Many treatments work best when given early

**Costs to the individual**
- Illness--fever, chills, coughing
- Risk of disease progression, secondary bacterial infections
- Long wait times

**Costs to the community**
- Burden on healthcare system
- Loss of Productivity
- Risk of transmission and spread in the community
ENACT – Early Notification to Act, Control, and Treat

• Areas of Interest Include:
  ▪ Novel Diagnostics, Biosensing Technologies, Wearables, and On-Person Tools
  ▪ Health Signature Discovery and Validation
  ▪ Indirect Indicators and Artificial Intelligence for Prediction
Novel Biosensing Technologies, Wearables, On-Person Tools, and Diagnostics

- Development of a next generation wearables and on-person tools toward **pre-symptomatic detection of infection and exposures**
- Minimally invasive and non-invasive technologies
- Multi-purpose devices that can be used to track and inform end user on health-related variables
- Cloud-based, advanced data analytics, and machine learning algorithms
- Diagnostics for use outside of healthcare settings, connected to systems for confirmatory diagnosis and fast provision of treatment
Health Signature Discovery and Validation

• Development of markers for health status
• Identification of those who are
  ▪ pre-exposed
  ▪ post-exposed pre-symptomatic
  ▪ post-exposed symptomatic
• Prognostication of symptom onset time, duration, and future health outcomes
• Readily adapted into a panel or diagnostic technology
Indirect Indicators and Artificial Intelligence for Prediction

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>LEVERAGE</th>
<th>PREDICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readily available</td>
<td>Big data analytics</td>
<td>Changes in healthy status</td>
</tr>
<tr>
<td>Integrated into daily life</td>
<td>Artificial intelligence prediction</td>
<td>Changes in behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potential exposure</td>
</tr>
</tbody>
</table>

- **PRODUCTS**
  - Readily available
  - Integrated into daily life

- **LEVERAGE**
  - Big data analytics
  - Artificial intelligence prediction

- **PREDICT**
  - Changes in healthy status
  - Changes in behavior
  - Potential exposure
• “Passive” eccrine sweat
• Biomarker detection
• Sensitivity maintained up to 48 hours
• Funding for process development, scale-up and proof of concept in human respiratory infection studies
Non-invasive health monitoring
• Respiration rate tracking equivalence to medical grade monitoring
• Heart Rate and Heart Rate Variability
• Sleep/Sleep Quality
• Activity
• Stress

Leveraging the power of data analytics and science to track individual health signatures from wellness to illness

Part of new collaboration with DARPA. Longitudinal clinical studies during influenza season collecting health signature data. Combined with pathogen identification and next-gen sequencing to validate platform

SCOPE
Predicting illness and outcomes prior to symptoms and transmission