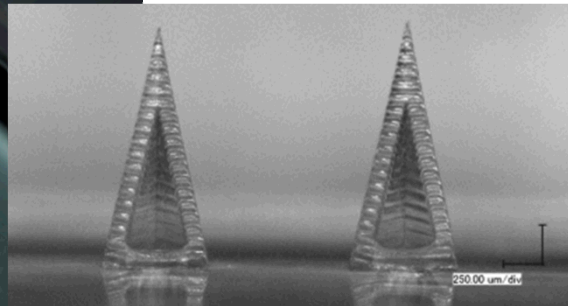
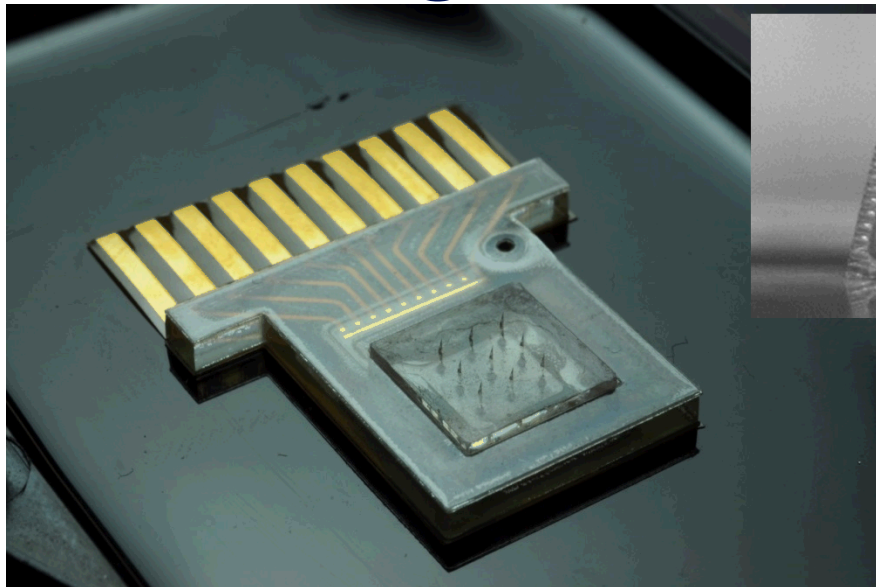


Microneedles for medical point of care diagnostics and drug delivery



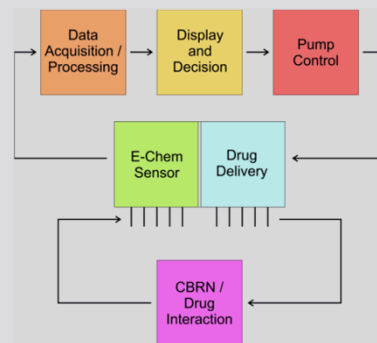
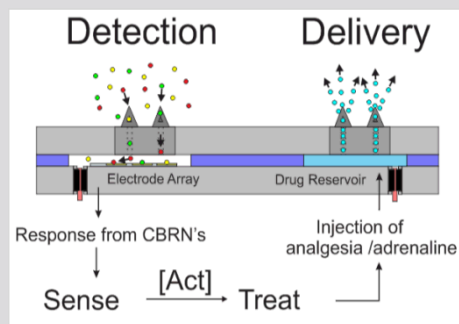
Ronen Polsky

Department of Biosensors and
Nanomaterials

February 25, 2015

Sandia MedTech Showcase

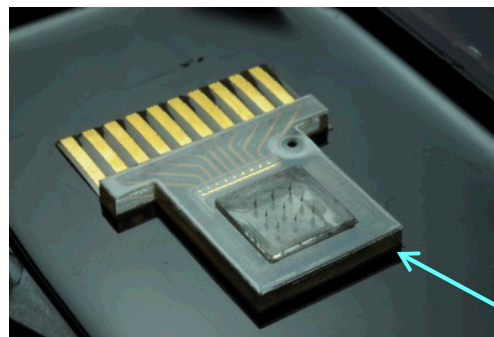
Brief Technology Overview



Diagnostic/Drug Delivery Sense/Respond System



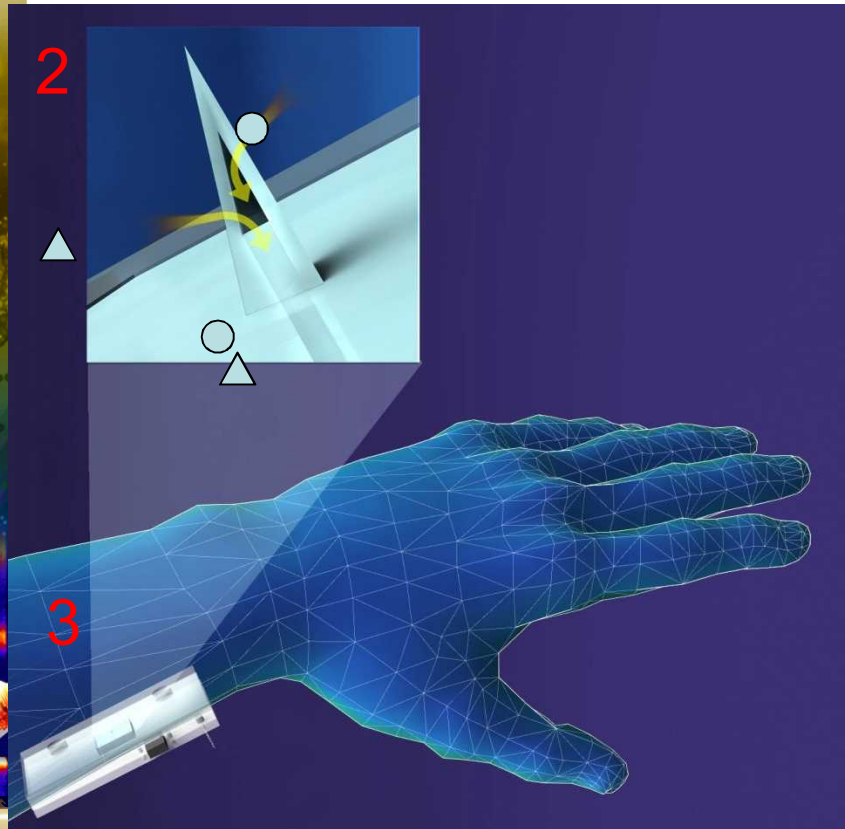
Portable Handheld Medical Analyzer



Wearable Point of Care Diagnostic Device



Underlying Technology



1. Minimally invasive microneedle painlessly accesses interstitial fluid.
2. Biological analytes are extracted from the interstitial fluid through a hollow bore in the microneedle.
3. The analytes are drawn onto a microfluidic chip with embedded sensors for immediate analysis.

In contrast with current point of care diagnostic systems, the technology allows for real time analysis without transfer of fluids from patient to device and can easily be used by a non specialist

Key Advantages

- ❑ **Continuously measure blood or interstitial fluid.**
- ❑ **Electronic readout and wireless transmission capabilities.**
- ❑ **Allows for measuring both short term and long term trends in an individuals physiology.**
- ❑ **Multiplexed sensing platforms allows for site specific and systemic monitoring of critical injuries and essential biological markers.**
- ❑ **Analysis can be done outside of clinical visits reducing time patients must spend in doctors offices.**

Differentiating factor from existing technology

- ❑ **The current state of the art wearable sensors today (e.g. fit bit) only make electrophysiological measurements such as heart rate, blood pressure, etc. Our technology allows for a suite of important biological markers to be measured that are currently only done in laboratory analysis.**
- ❑ **The ability to make real time measurements of an individuals physiology outside of a doctors office will make diagnosing and assessing medical conditions much easier and lead to better disease prevention.**
- ❑ **There are currently no practical methods to make a diagnostic/ drug delivery device.**

Commercial Applications

- ☐ Point of Care Diagnostics/Home Health Care
- ☐ Sports Medicine
- ☐ Infectious Disease Treatment
- ☐ Defense of the Warfighter