Warfighter Health and Performance

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Mr. Edward Wack

MIT Lincoln Laboratory

6 March 2018

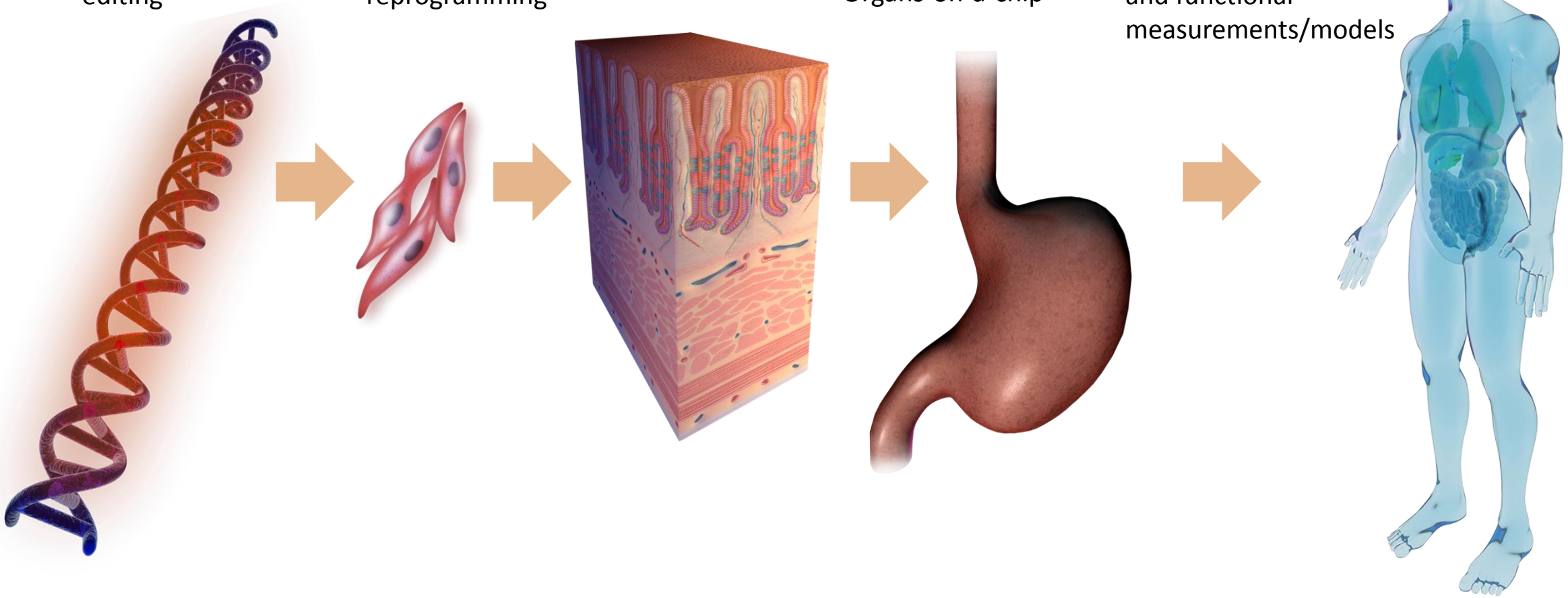
Select Revolutions in Biotechnology

DNA read, writing, editing

Stem cell reprogramming

Organs-on-a-chip

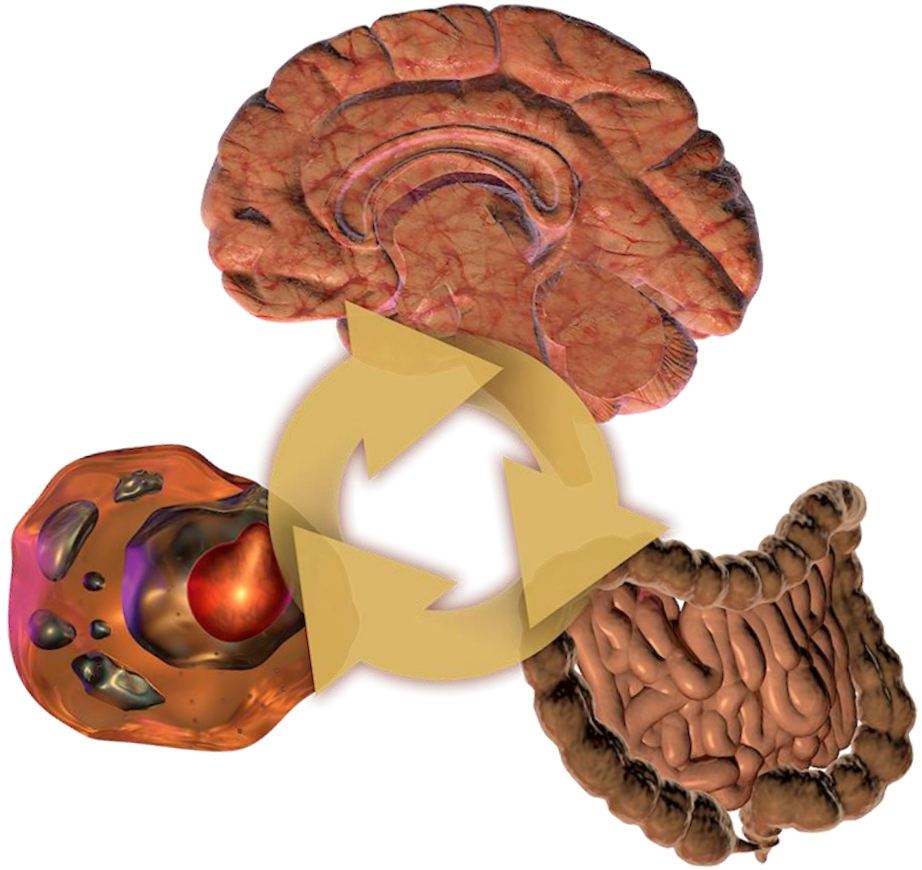
Structural and functional measurements/models



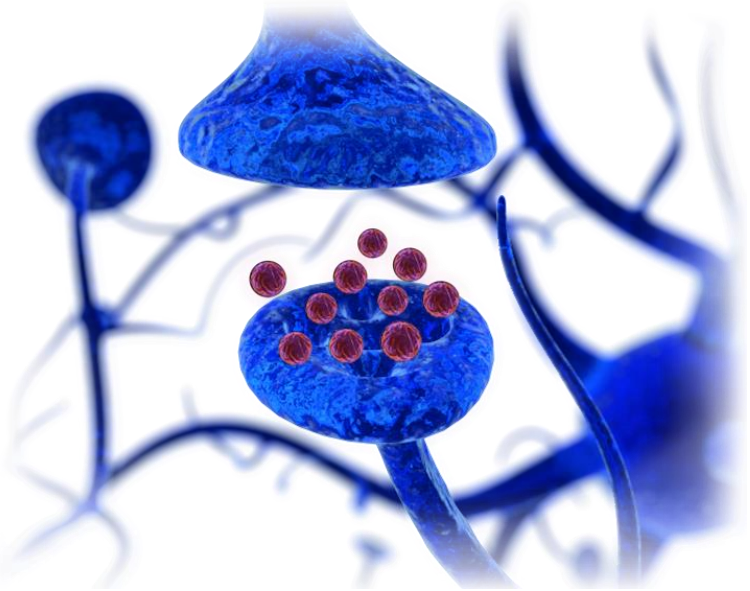
Complex Biological System Interactions

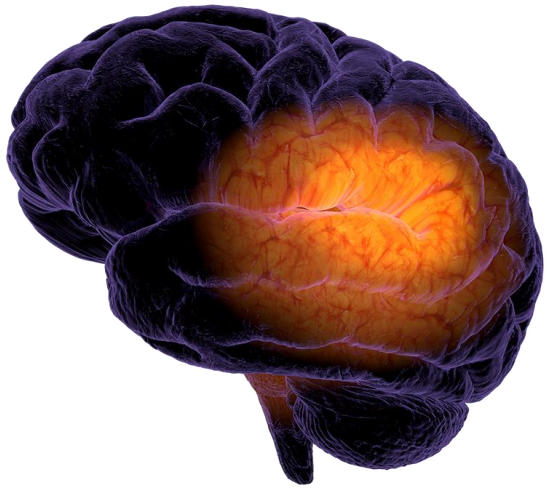
- Understanding complex systems,
  like the microbiome and its affect in the gut,
  immune system, and brain

- Modulating the body through these routes
  to improve health and performance



Complex Biological System Interactions





Operational Threats to Our Warfighters

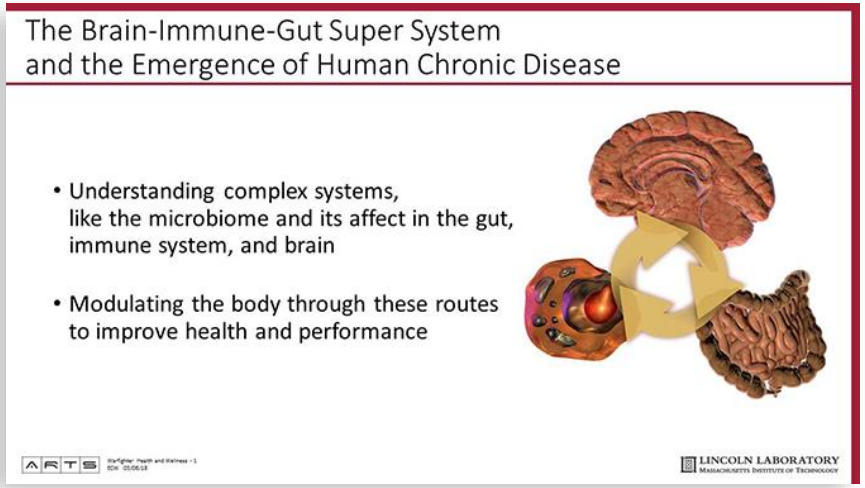
- Environmental extremes (heat, cold, altitude)
- Physical and cognitive load
- CBRN
- Ballistic/kinetic
- Directed energy
- Psychological trauma
- Trauma care in austere environments

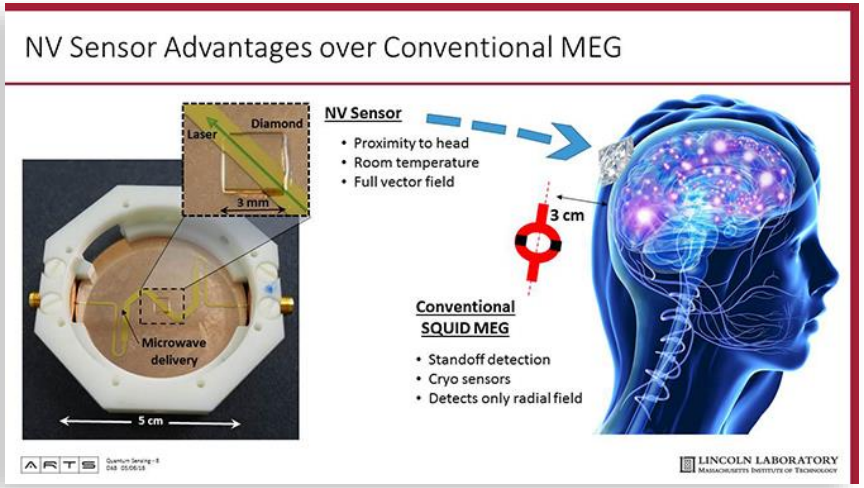




Revolutions in Biotechnology – The Speaker Session

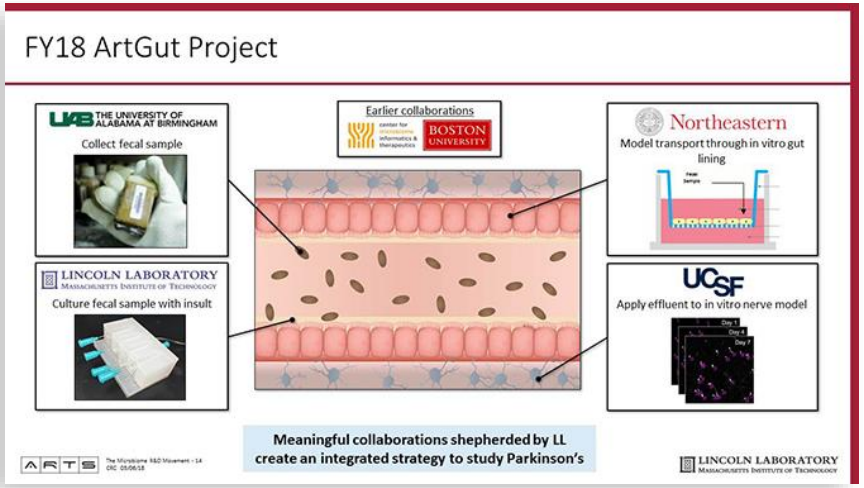
Keynote Speaker for Revolutions in Biotechnology





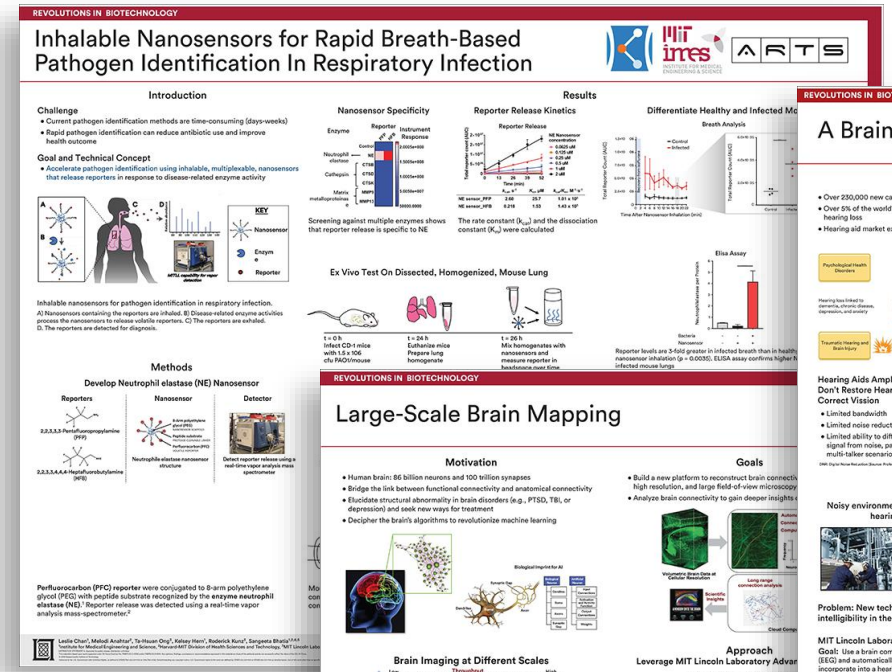
Diamond Sensors for Brain Imaging

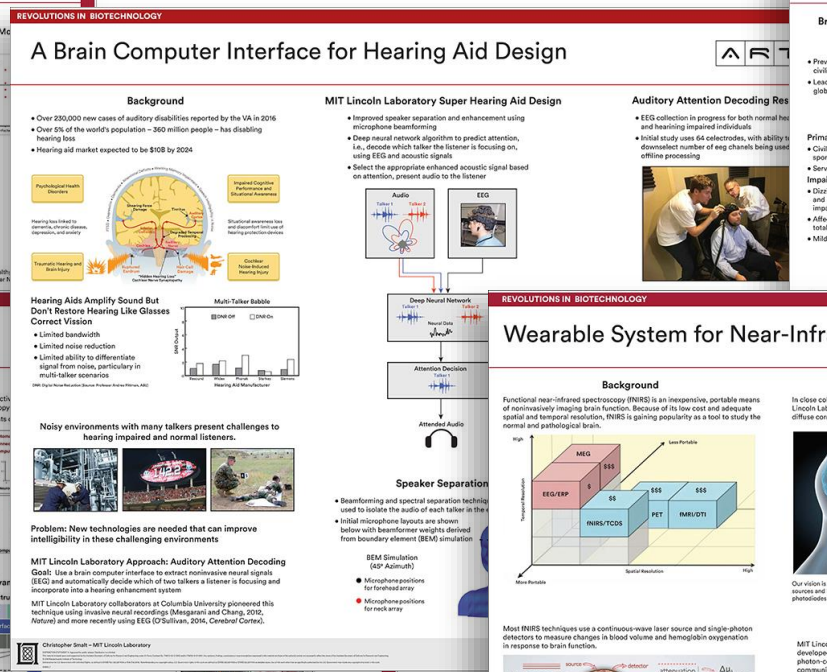
Microelectronics Interfacing Neural Devices (MIND)

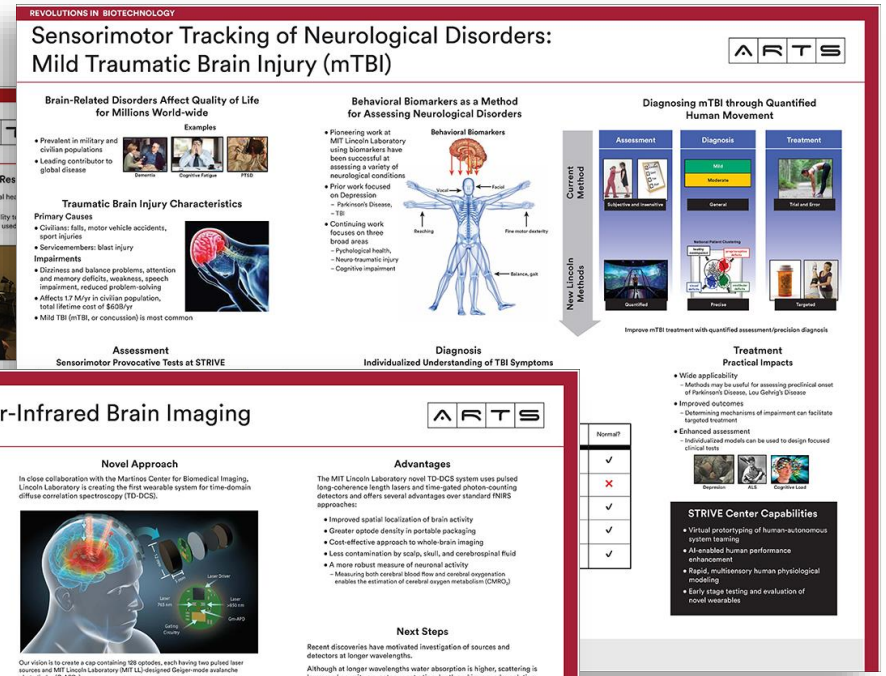


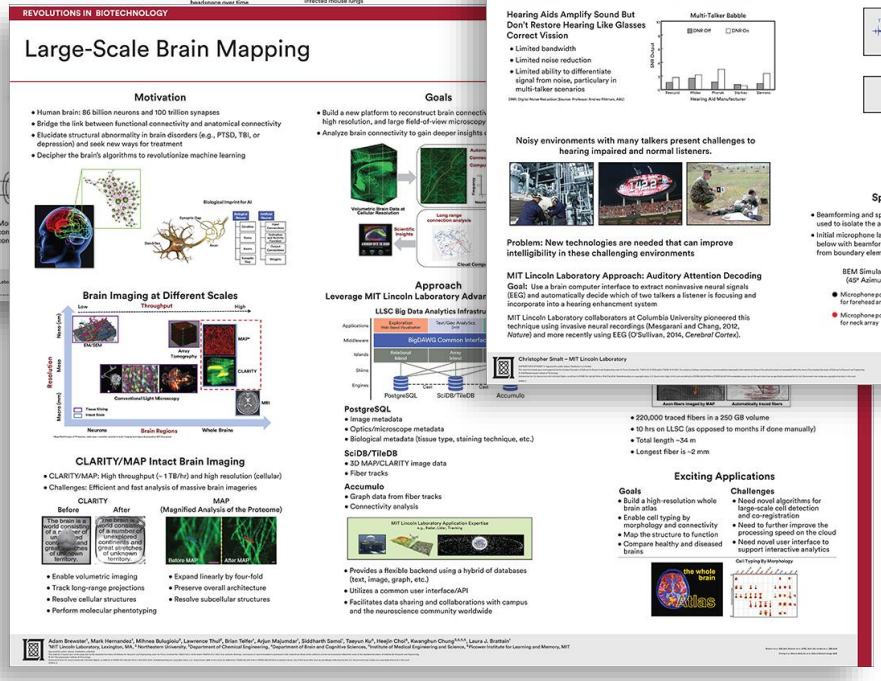
Microbiome

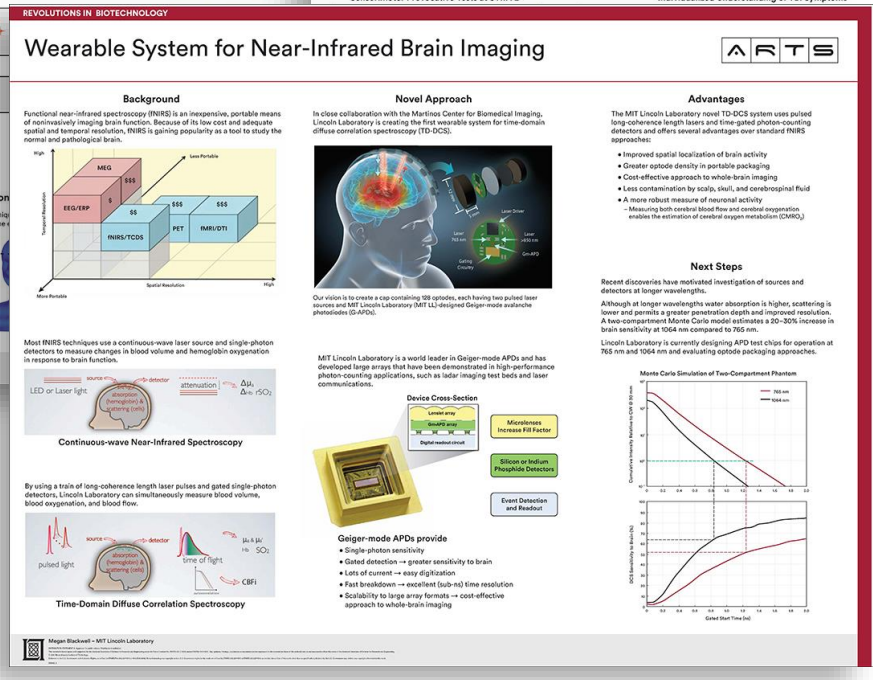
Revolutions in Biotechnology – The Poster Session











Looking Towards the Future

- Biotechnologies are advancing at a rapid pace
- We will continue to develop and apply these biotechnologies to solve critical health and performance challenges
- This will lead to healthier and more effective servicemembers
  - Active duty and reintegrating into civilian life
- … and healthier and happier civilians as military medical technologies transition to the commercial sector