



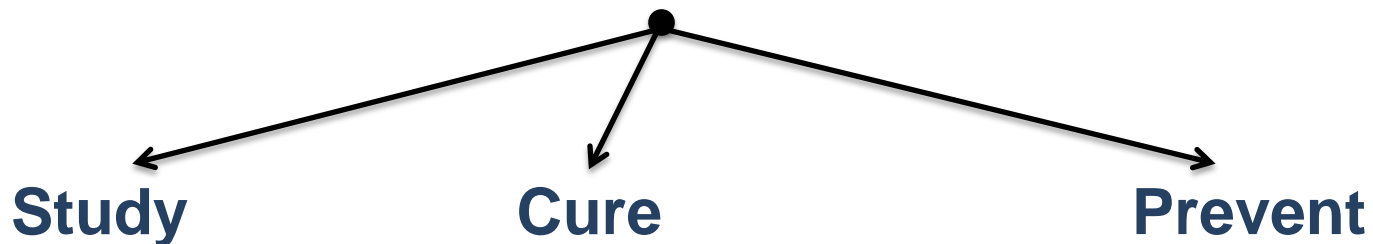
NeuroExp presents:

A device to simulate blast-induced traumatic brain injury to study the injury, to translate the results into drug discoveries, and to inspire engineering to drive prevention

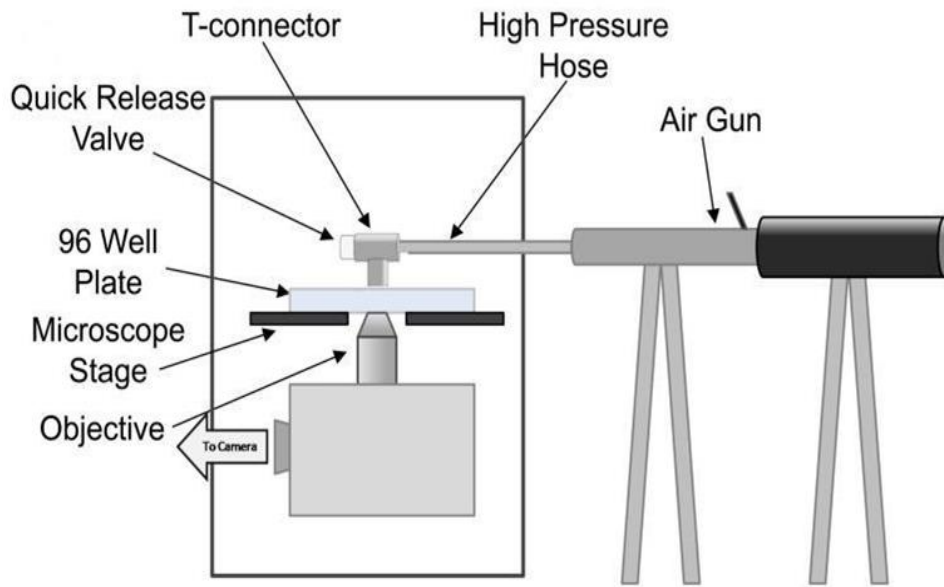
Current Major Challenges in Blast-induced Traumatic Brain Injury (bTBI)

HIGH COMPLEXITY	QUESTIONABLE UNDERSTANDING	LIMITED <i>IN VIVO</i> MODELS	NO <i>IN VITRO</i> MODELS
<ul style="list-style-type: none">• Blast shockwave propagation is complex and varied• Leads to injury that is not obvious	<ul style="list-style-type: none">• Mechanism of how blast shockwaves lead to brain injury is not understood on the cellular level	<ul style="list-style-type: none">• Animal models do not replicate blast-induced neurotrauma (BINT) effects on human brain cells	<ul style="list-style-type: none">• Well-designed experimental models are lacking• None allow for a real-time study of the injury

Value Proposition

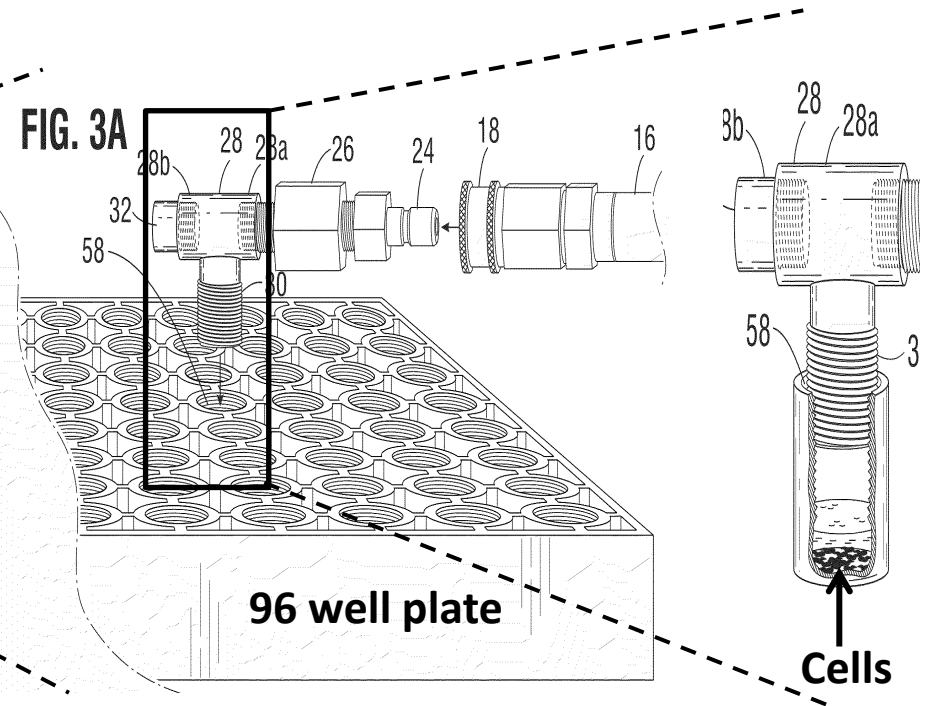
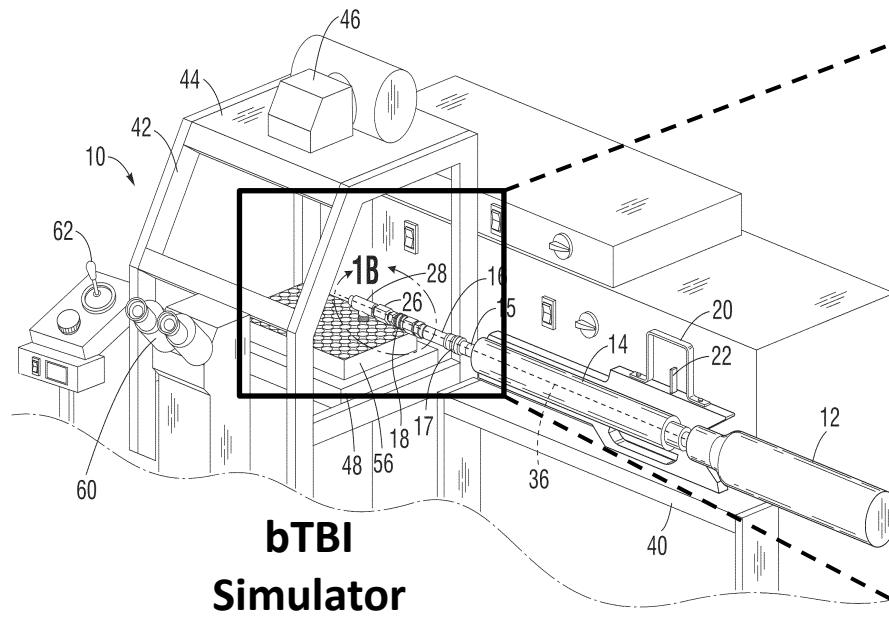


Study blast-induced traumatic brain injury (bTBI) on a cellular level
Quantify current understanding to discover drugs and therapies to **cure** TBI
Engineer novel materials to **prevent** such injuries



The airgun delivers
controlled and
reproducible pressure
waves to the cells

The response is
observed in real-time
and is quantifiable



Controllable

Quantifiable

Reproducible

Adjustable

Robust

Market & Competition

Segments: Research Tool, Drug Development, Biomaterials Engineering

Market Need

- **1.7 million people** sustain TBI per year
- **4,500 people** experience TBI every day
- **40%** of TBI patients **deteriorate** after hospitalization
- **1 out of 5** soldiers have been diagnosed and many go undiagnosed or misdiagnosed

Competition

- **Research trials** of molecular targeted therapies (BHR-100, NeuroSTAT, rhuEpo)
- **Weak** competition due to lack of understanding of the injury
- **Gaps in Market:** Delayed diagnosis, poor societal awareness of TBI, qualitative-only diagnosis

1. Research Tool (short-term)

- **Current diagnosis/testing:** symptoms-based, evaluation of blood flow
- Lack of direct cell and tissue analysis of brain cells for TBI detection

2. Drug Development (long-term)

- **2010** – worth US **\$1.54 billion**, forecast to reach **\$2 billion by 2017**
- **Market potential:** Use brain cell and tissue imaging to develop targeted drug treatments

3. Biomaterials Engineering (long-term)

- Focused on **TBI prevention**
- U. Arkansas: Bioreactor to simulate physical impact but not on cellular level
- Use of mice models and analyzed posthumous

Raise funding to
build **prototype** for
in vitro experiments

Collaborate with big
pharma to develop
HTS assay

Next generation
prototype: Care
AND prevent

2015

2016-2021

2017-2020



☐ Industry Standard Prototype

☐ In vitro, cell culture testing

☐ Commercialize

☐ High throughput screens

☐ Drug discovery

☐ Protect IP

☐ Commercialize

☐ Testing with brain slices

☐ Test novel biomaterials

☐ Protect IP

☐ Commercialize

Raw
Material
Expense

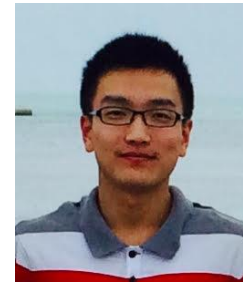
Inspection

Labor

**Industry-
Standard
Prototype**



Emily Zhen:
Undergraduate LSM;
cognitive neuroscience,
finance, marketing



Yike (Ecko) Chen:
MEAM Graduate;
Mechanical and electrical
design, programming

Team



Mithil Chokshi:
Bioengineer ('13); drug
discovery, biomaterials,
business development



Medha Sengupta:
MLA Graduate;
Neurobiology, clinical
trials, business
development



Krystle Karoscik:
MLA Graduate;
Neurobiology, clinical
trials, business
development