BRP: NINDS

# An Organotypic Model of Traumatic Brain Injury

Aim: *In vitro* TBI model: a) deliver defined, scalable mechanical insult
b) characterize biological injury cascade.

## Engineering

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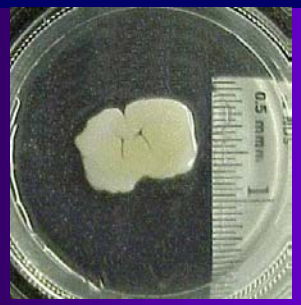

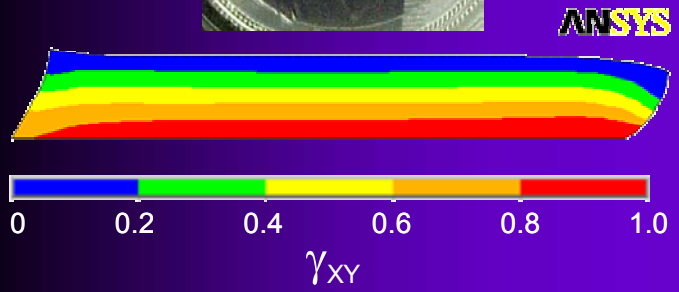


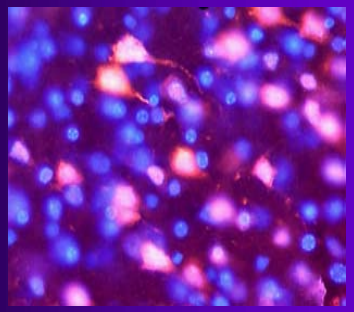

## Neurobiology

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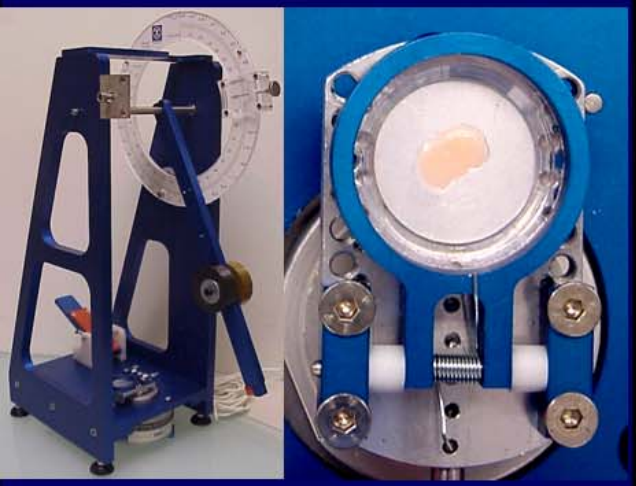
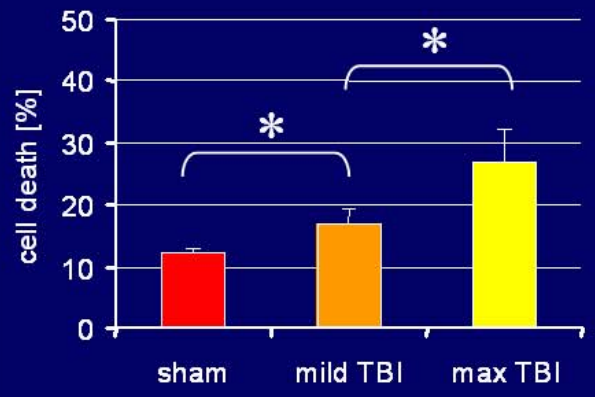
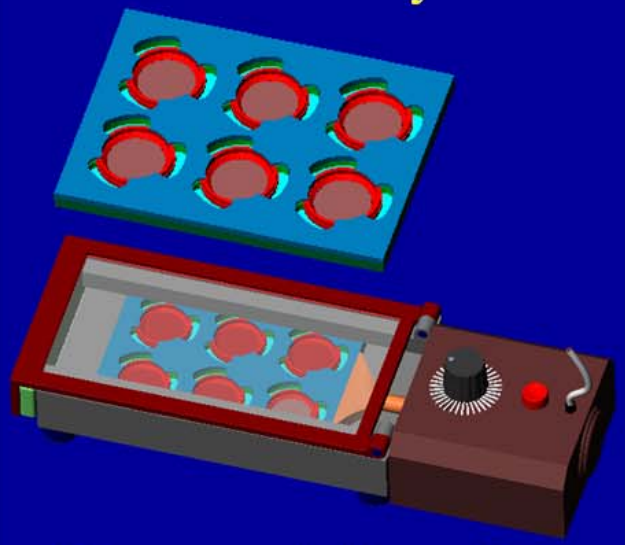
# 1st Generation Model



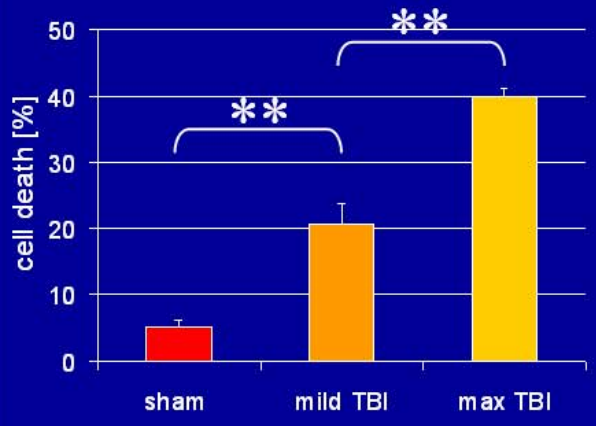
- Hole brain slice culture
- Shear by rotational acc.
- Single well system
- Modest scalability




# 2nd Gen TBI System



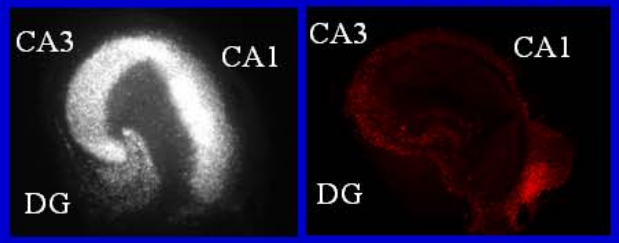
- Hippocampal slice culture
- Shear by linear acc.
- ↑ throughput / user friendly
- ↑ scalability
- ↑ reproducibility

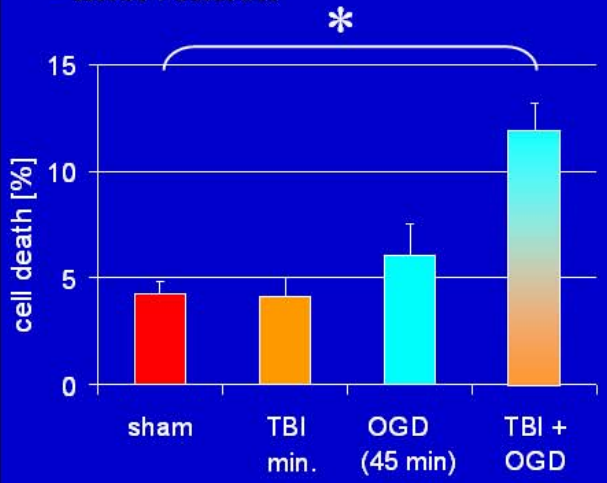



# Model Application

Analysis:

- Death: LDH, PI, Western Blot
- Function: Ca Imaging, fEPSP, long-term potentiation




Aims:

- Injury pathway
  apoptotic / necrotic
  time-history / threshold
- mild TBI + OGD
- intervention