



THE EFFECT OF MILD BLAST-INDUCED TBI ON FEAR CONDITIONING IN MICE

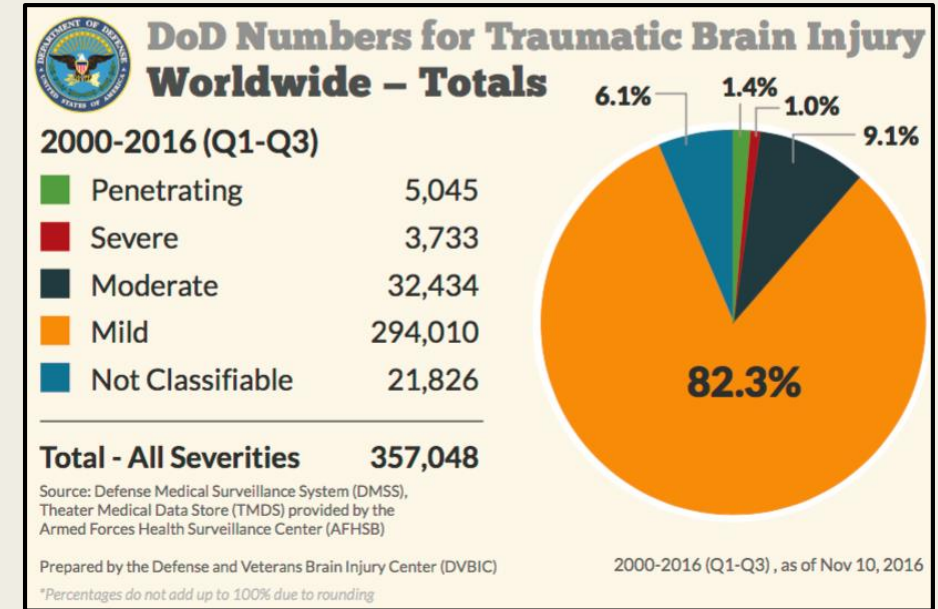
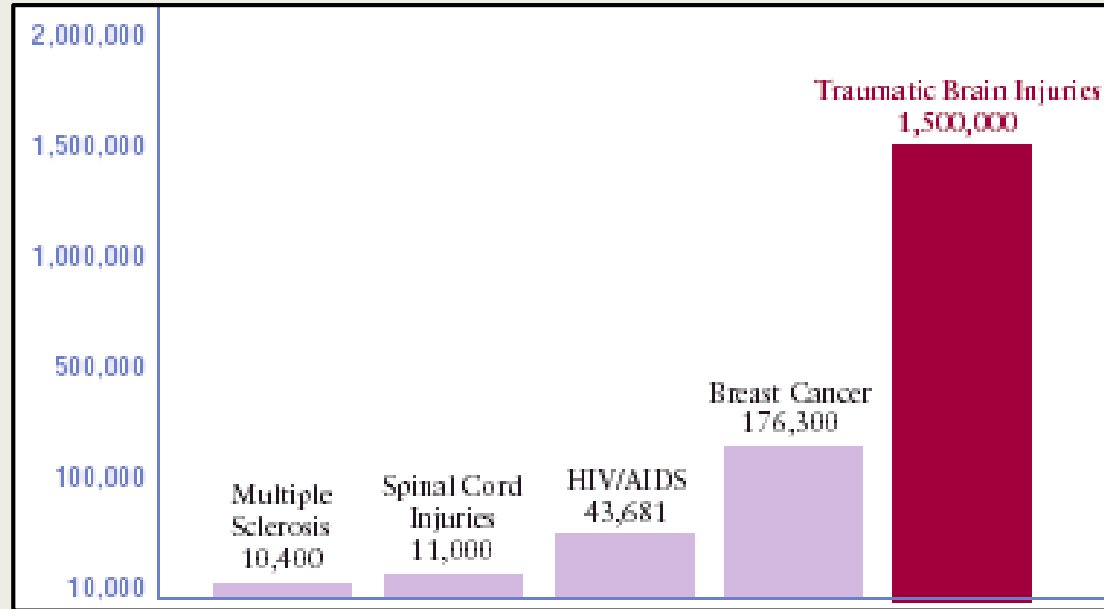
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General Information

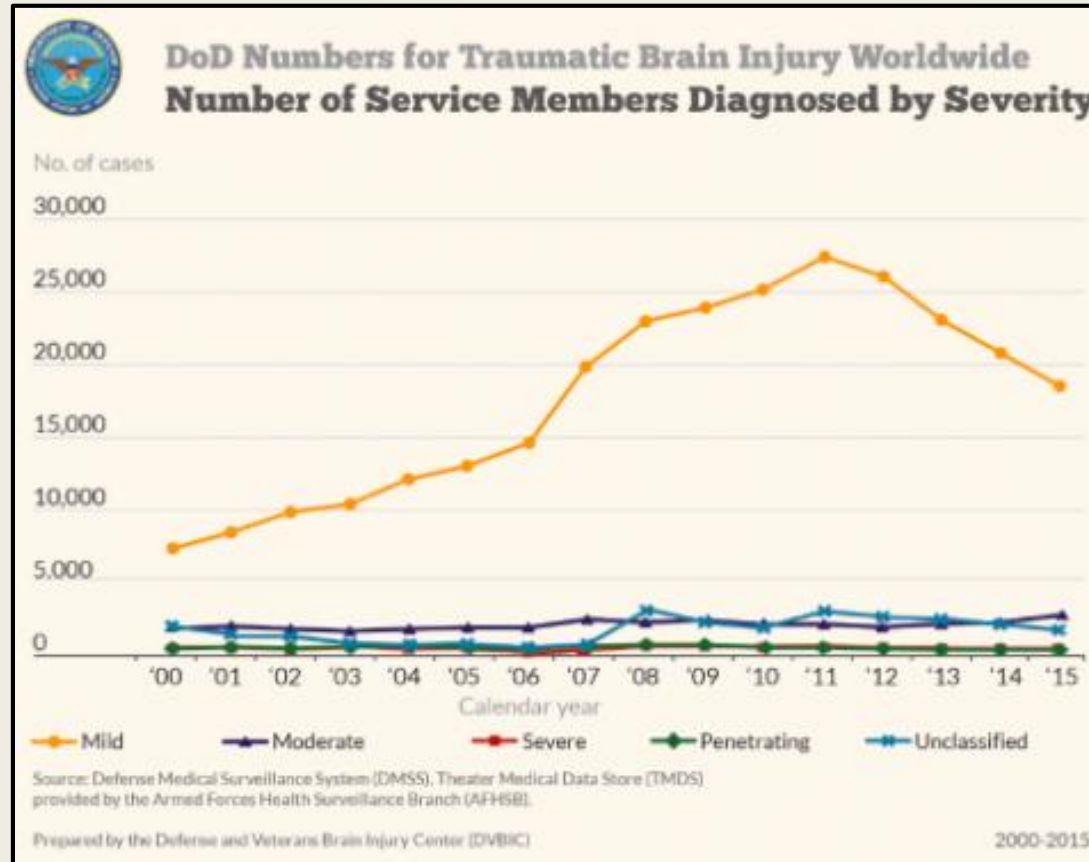
- June 17 – August 16
- USUHS, Comprehensive Student Research Training Program
Department of Obstetrics and Gynecology
- Lab's goal:
 - Understand how stress affects the HPA axis of mice and rats

Traumatic Brain Injury (TBI)



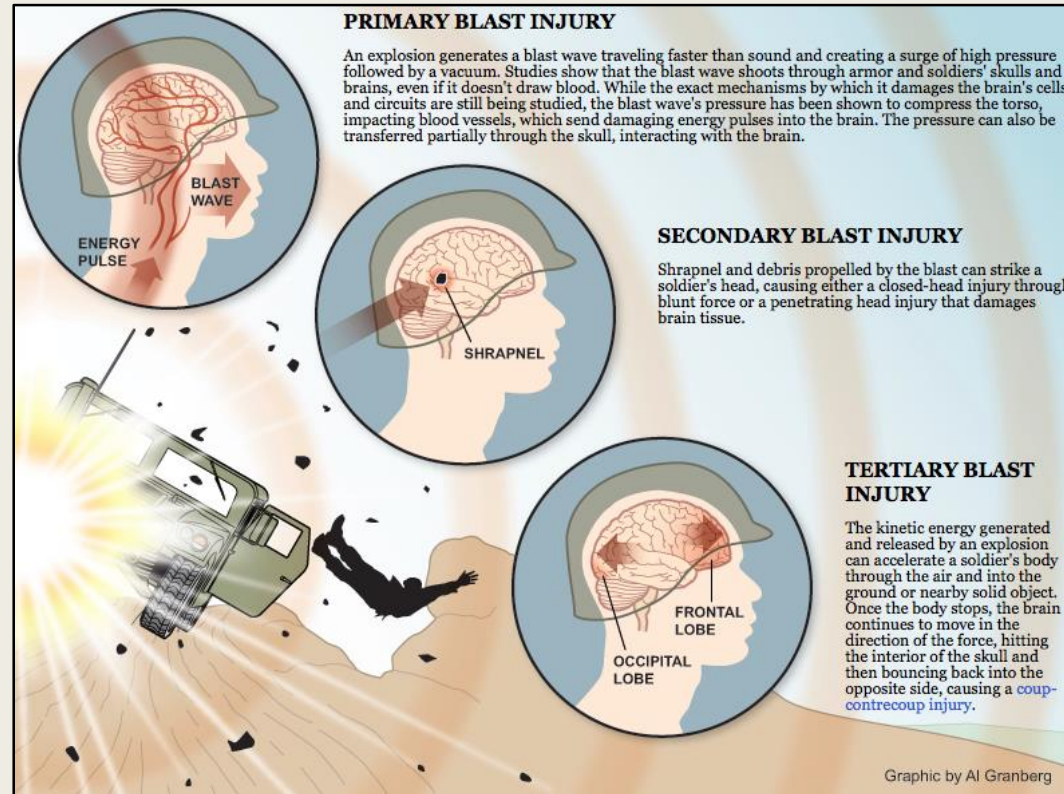
- TBI patients are often diagnosed with neuropsychiatric disorders
- Women develop anxiety disorders more often after TBI

Effect on Service Members



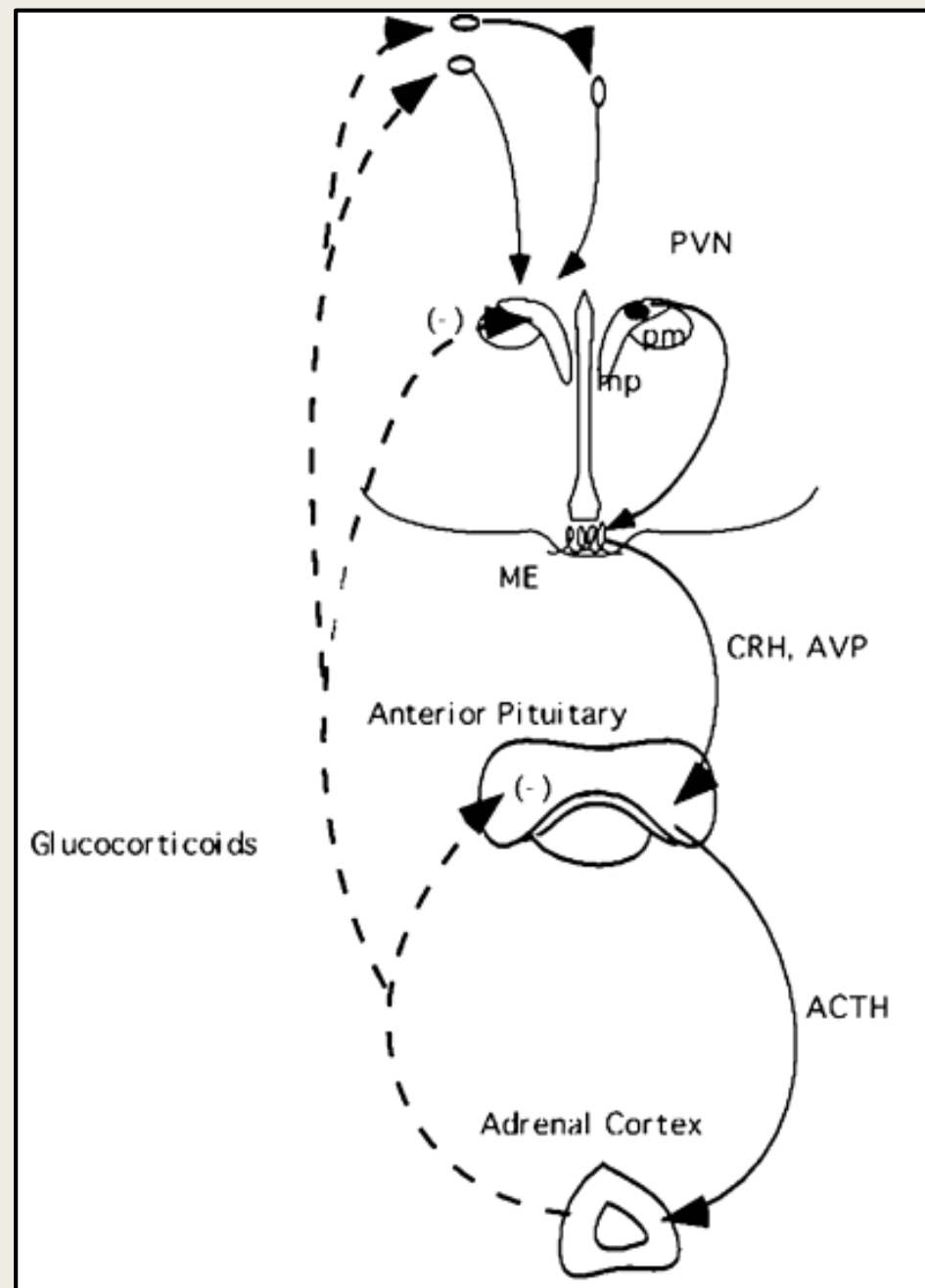
- ~30% veterans diagnosed with mTBI also develop post-traumatic stress disorder (PTSD)

Blast-Induced TBI



- In OIF/OEF active duty military populations majority of TBIs were blast-induced (b)TBI
- (60-75%)

HYPOTHALAMIC PITUITARY ADRENAL AXIS



Aims

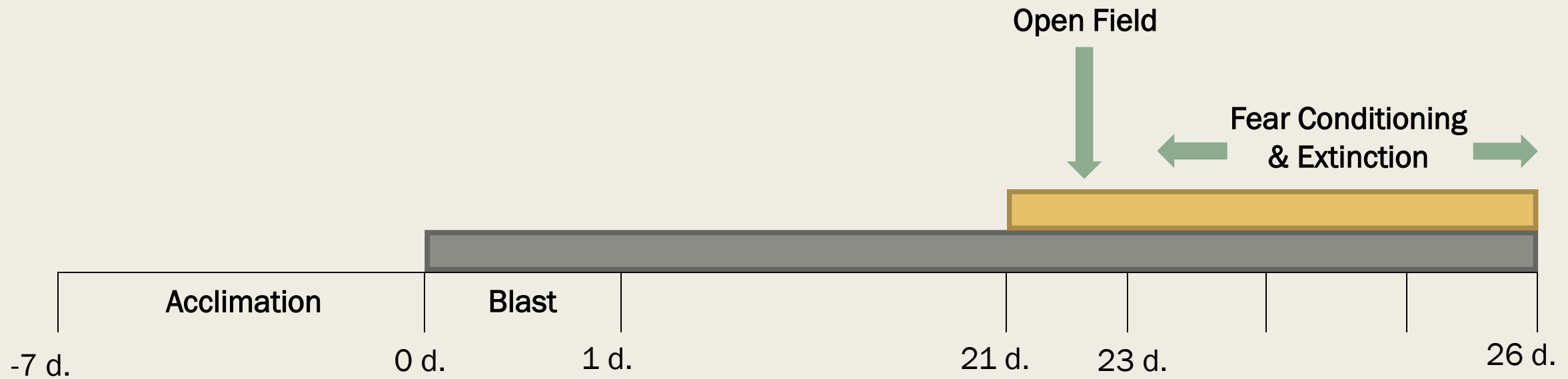
1. Characterize fear and extinction memory after blast
2. Characterize neural circuitry pathways after blast

Method (Blast)



Average psi	15.5+/-SE
Average time under anesthetic (s)	340+/-SE
Average time of blast/anesthesia	9:00 am

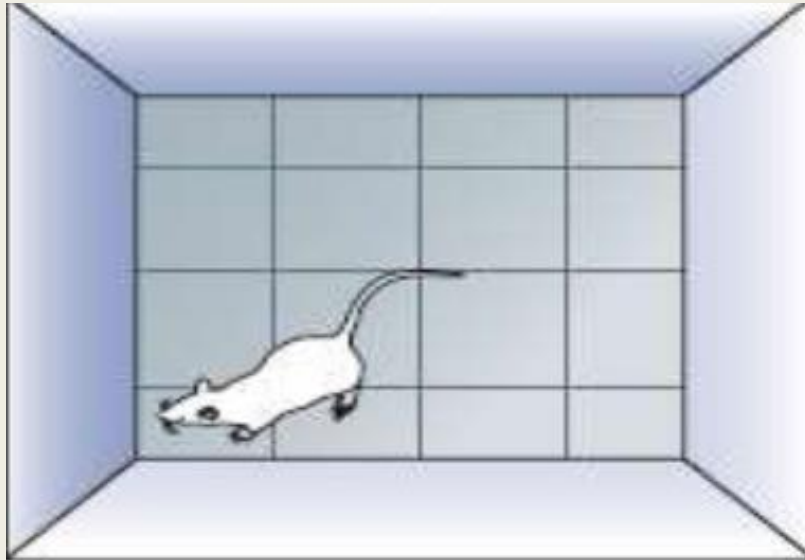
Experimental Design



Method (Conditioning)

Open Field Test

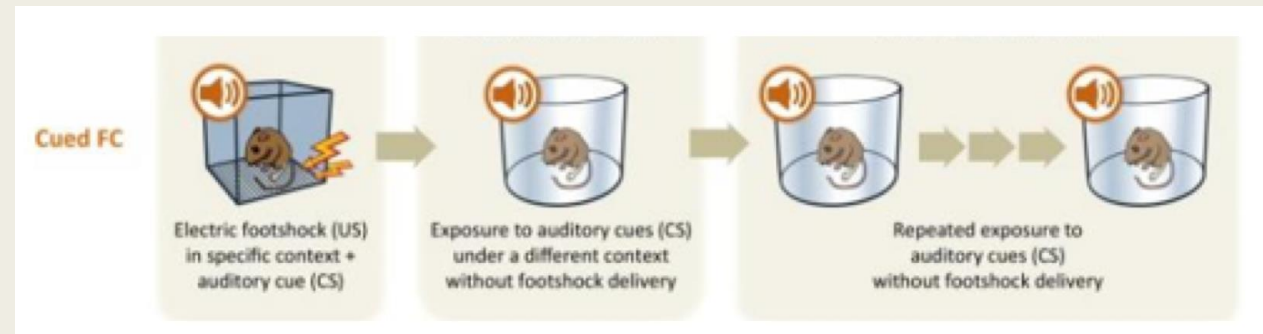
- Testing for mobility and anxiety in mice



Advaitha et al., 2015

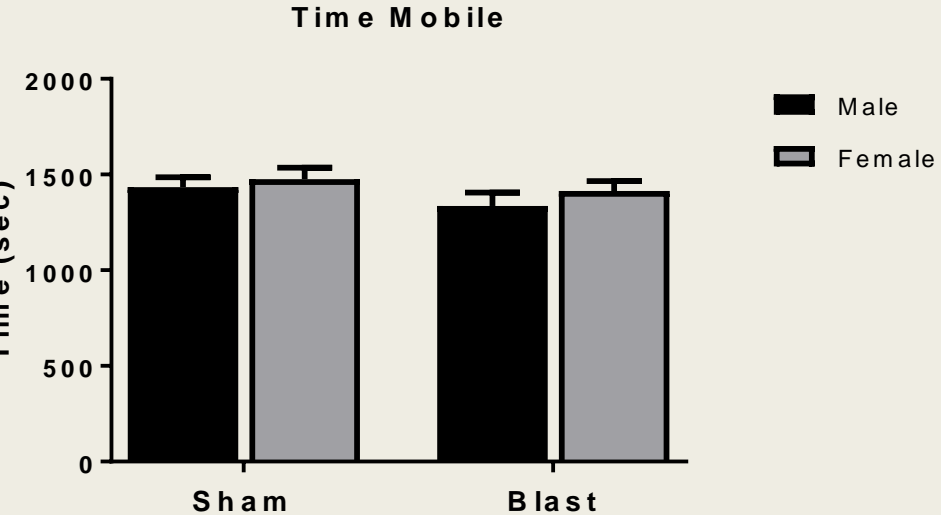
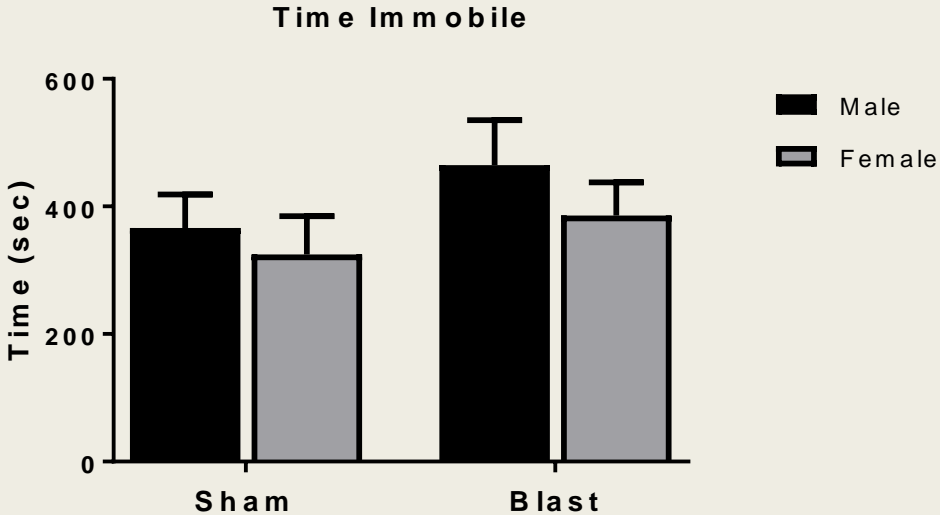
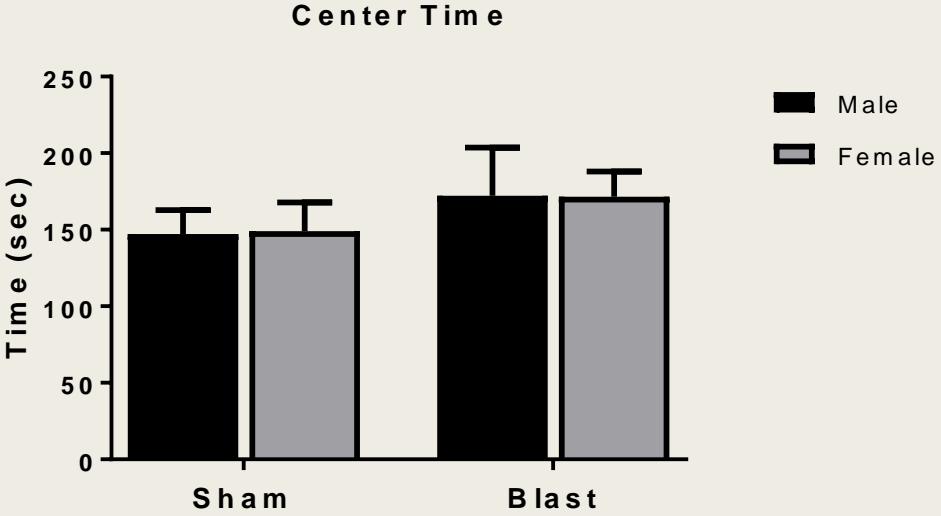
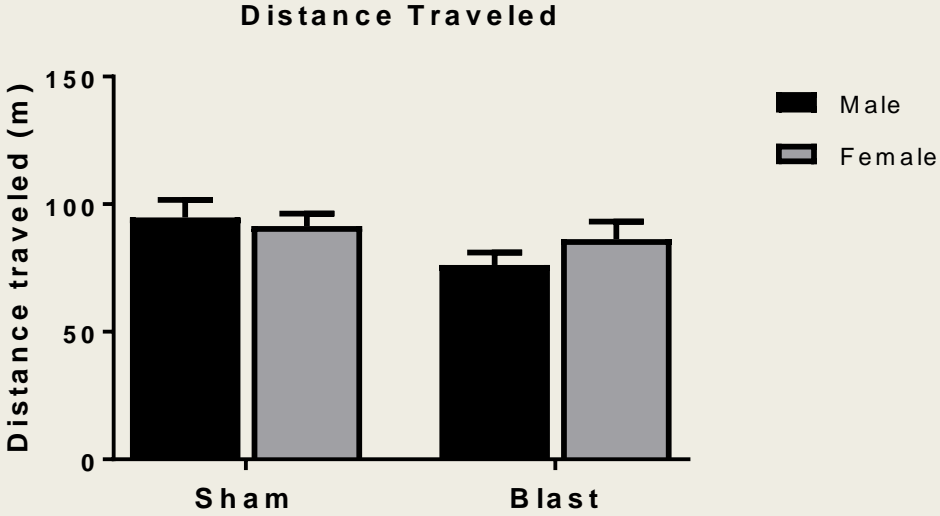
Fear Extinction Testing

- Testing for freezing in mice
- Three steps:
 - (1) *Fear conditioning*
 - (2) *Fear Extinction*
 - (3) *Extinction Recall*



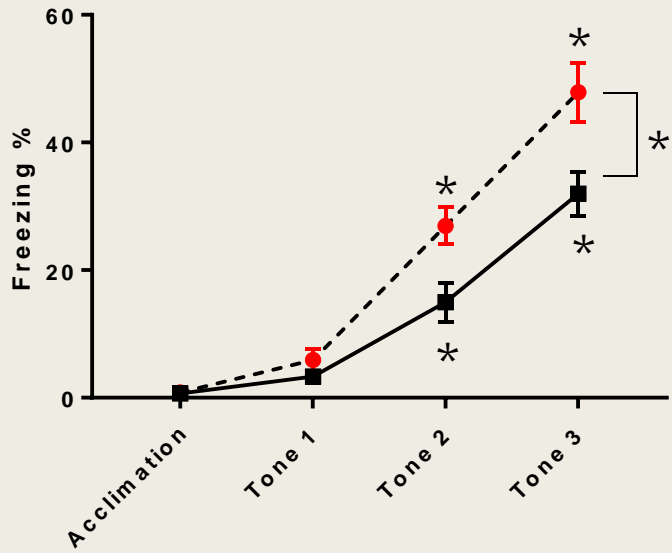
Flores et al., 2015

Open Field

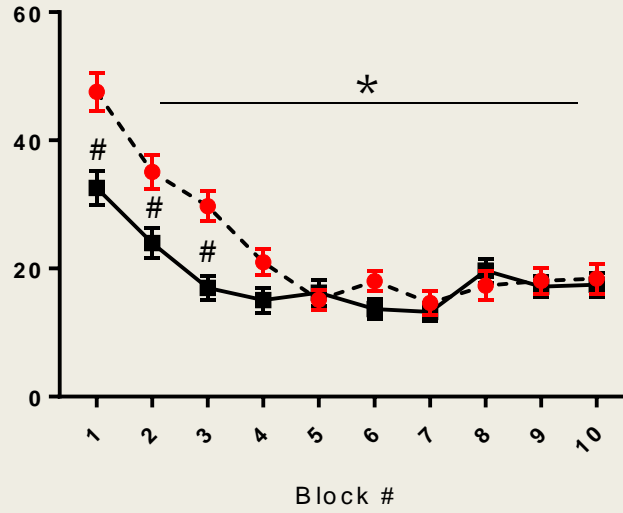


Fear Extinction

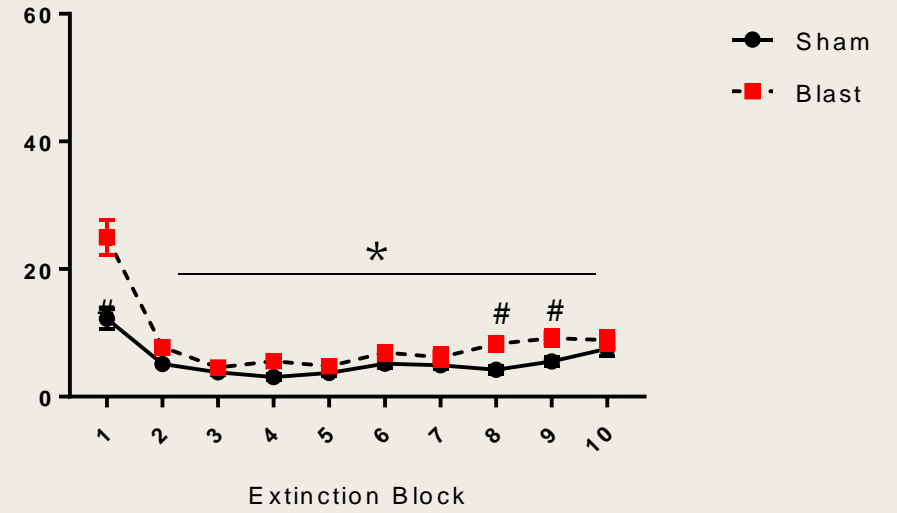
Acquisition (Females)



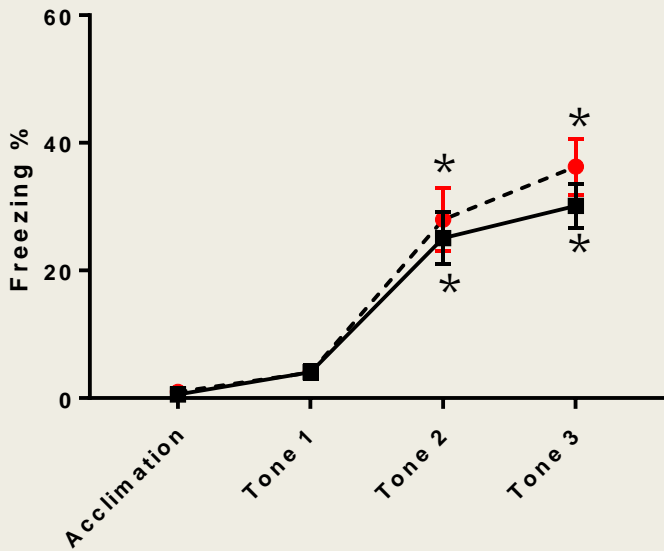
Extinction (Females)



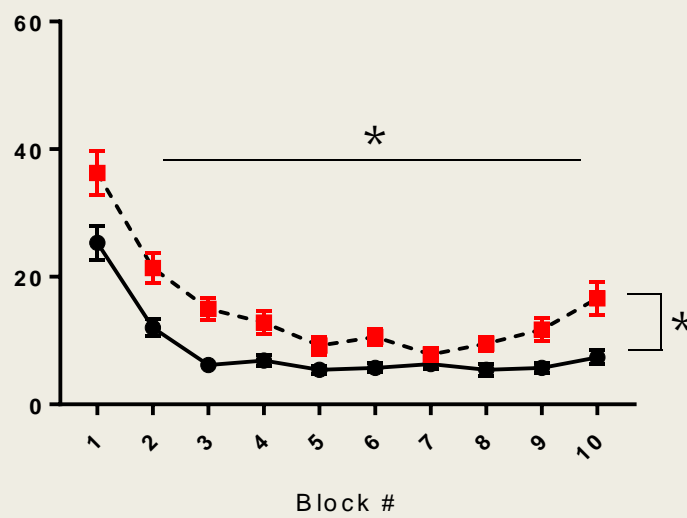
Extinction Recall (Females)



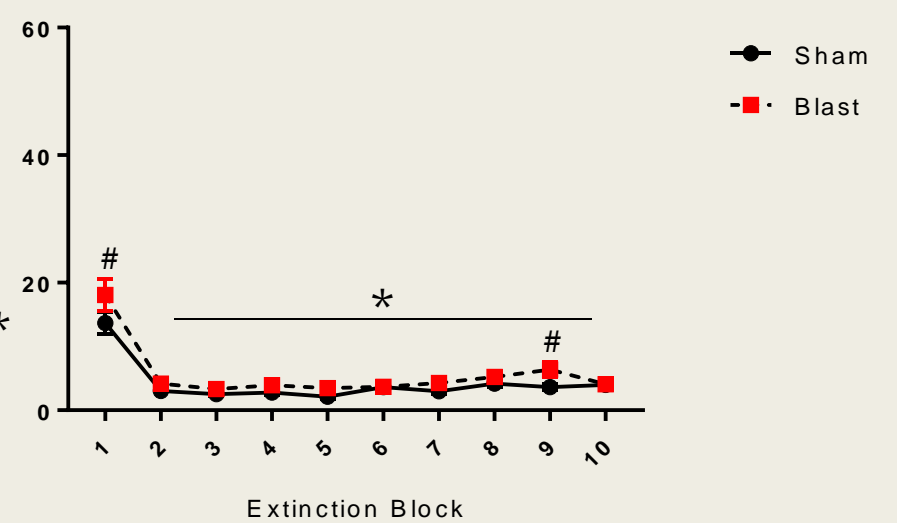
Acquisition (Males)



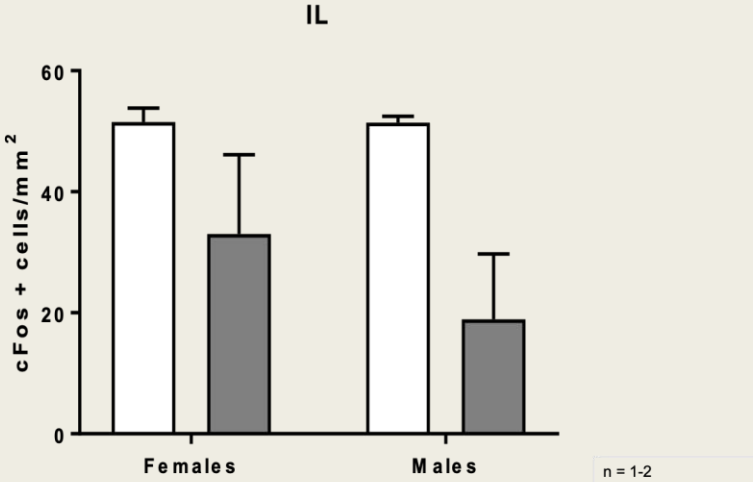
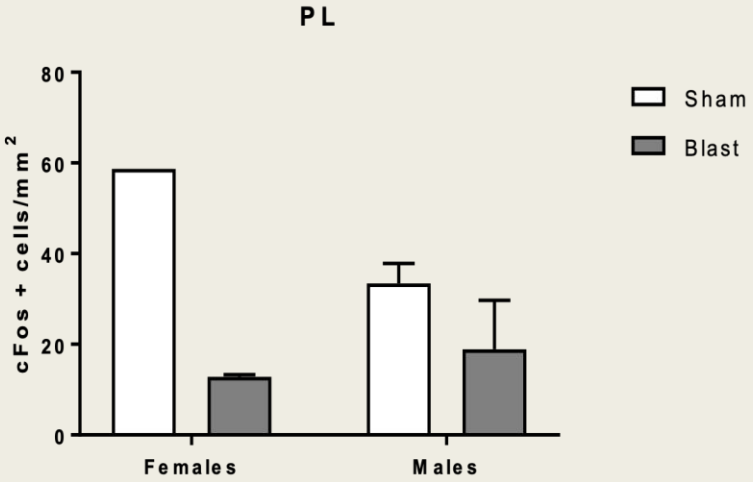
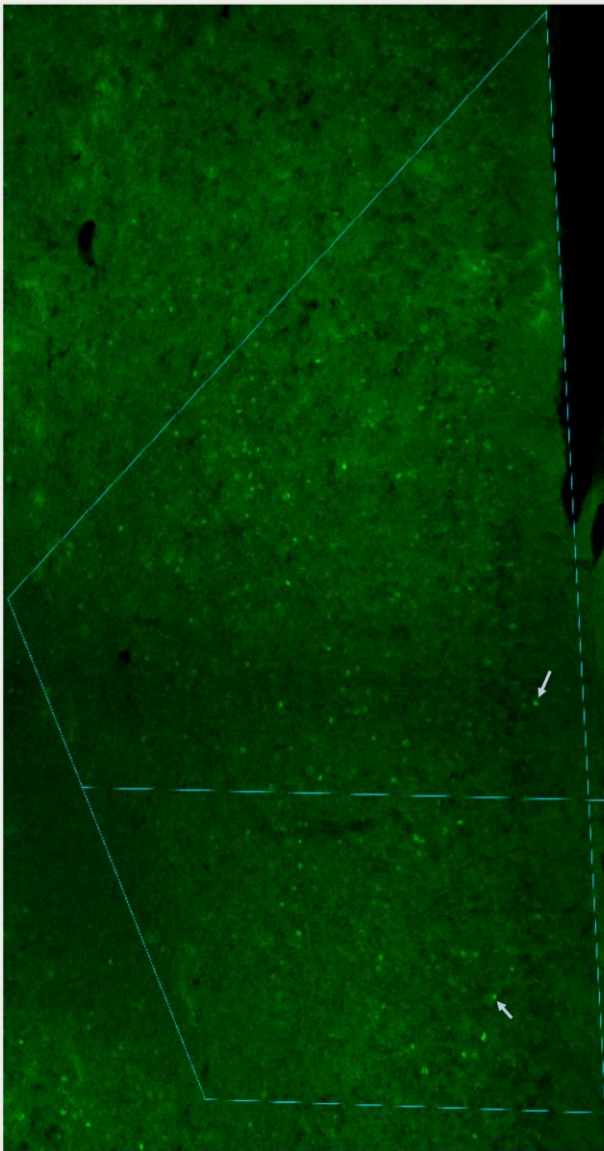
Extinction (Males)



Extinction Recall (Males)



cFOS Imaging



n = 1-2

Summary

- Little difference between sham and blast mice in open field testing
- Blast mice, especially females, showed longer time to extinguish fear compared to sham mice
- Greater decrease in cFOS expression in female blast mice than in male mice
- Fear circuitry affected by blast TBI

What I learned

- Never be afraid to ask questions
 - *It's okay to make mistakes!*
- Having a strong foundation is important
 - *Know your lab skills!*
- Learn best from repeated practice
- Be social, make friends!
- Be proactive, have fun!

Acknowledgements

Wu Lab

- Dr. T. John Wu (PI)
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Holton

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THANKS FOR LISTENING!

ANY QUESTIONS?