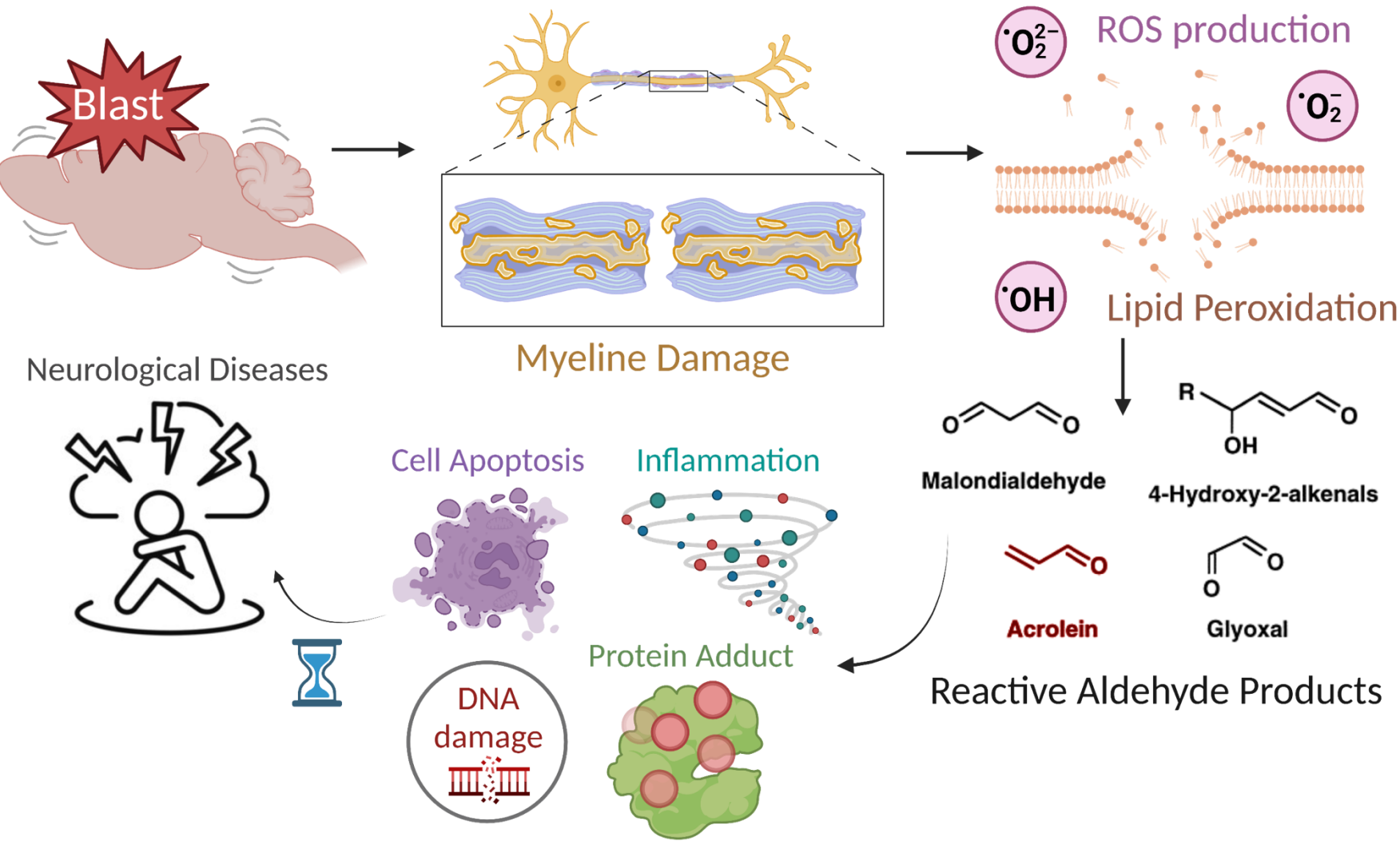
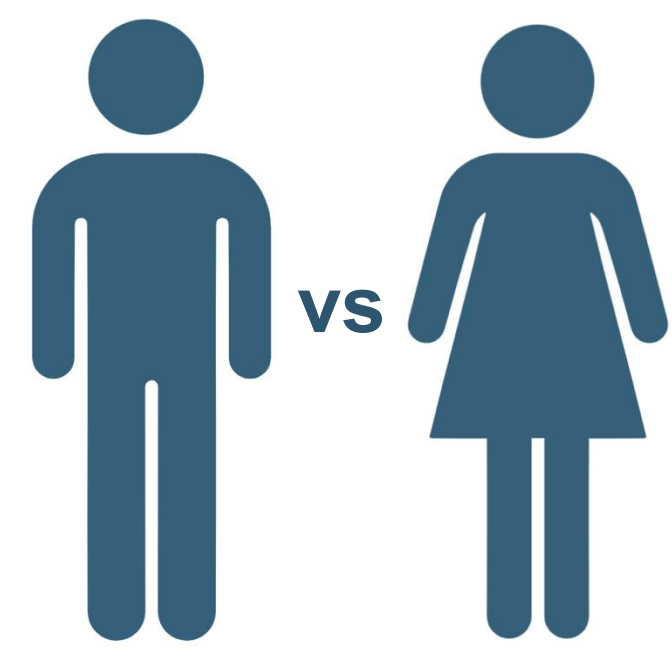


Background



- Military conflicts continue worldwide
- Traumatic brain injury caused by blasts (bTBI) a health concern in the soldiers and civilians affected

- 15.6% of the U.S. army is female
- Little known about differences between the two sexes in response to bTBI



METHODS

Animal Models:

- Adult male and female C57BL/6 wildtype mice.

Blast Traumatic Brain Injury (bTBI)¹:

- Shock-tube pneumatic blast model for three consecutive injuries

Oxidative Stress Histology²:

- Brains sliced into 25µm thickness free-floating tissues for histology analysis
- Acrolein was staining with ABC complex solution and DAB Peroxidase Substrate Kit

Fear conditioning:

- A series of tests to assess the fear-related memory learning and retrieval response were conducted
- 2 contexts on multiple days

Statistics:

- Presented as mean ± SEM (n≥6).
- Two-tailed unpaired T-test, one-way ANOVA, or two-way ANOVA were used with p-value <0.05 considered statistically significant (*).

Fig. 1. Schematic of the blast traumatic injury (bTBI) device

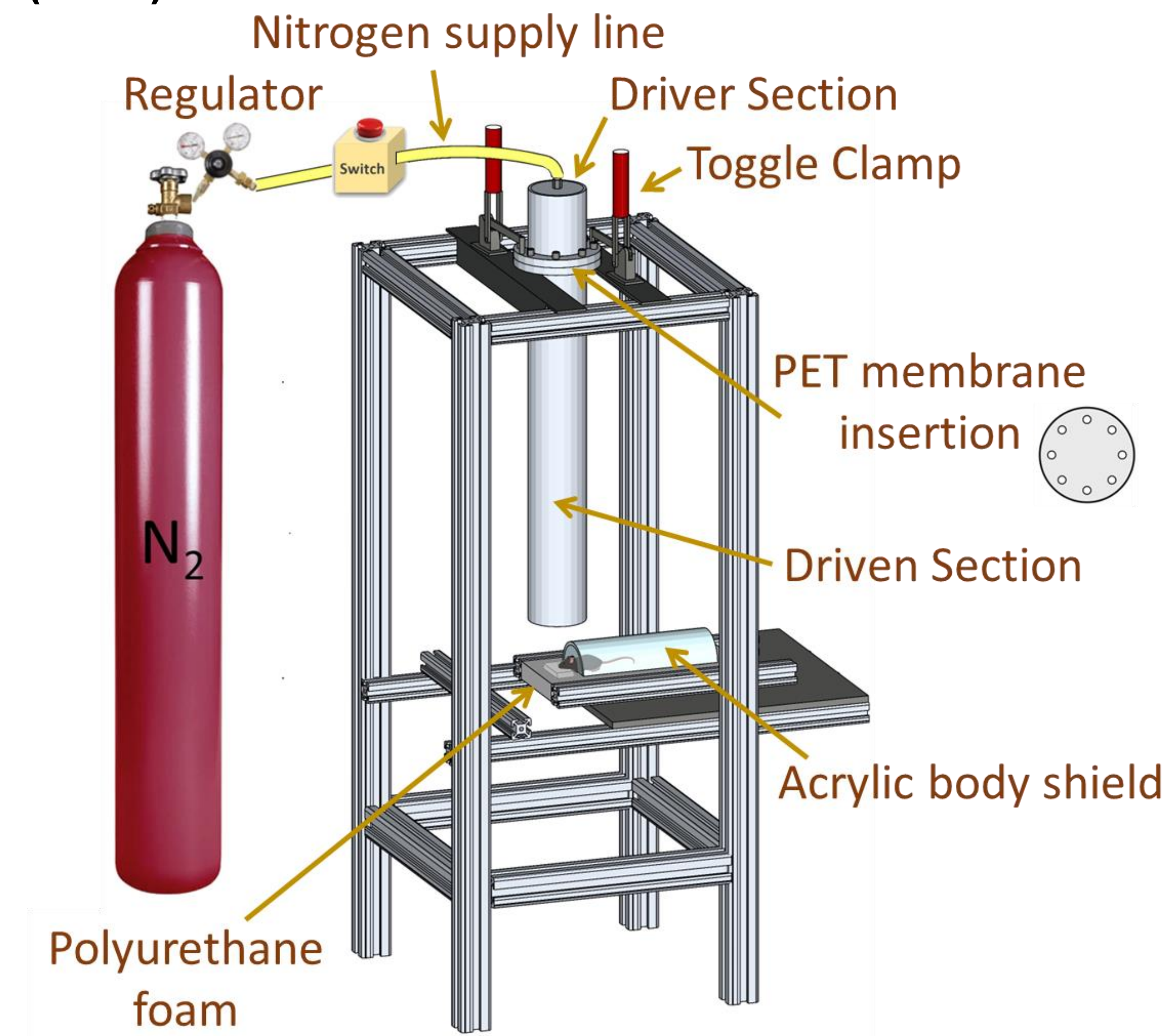
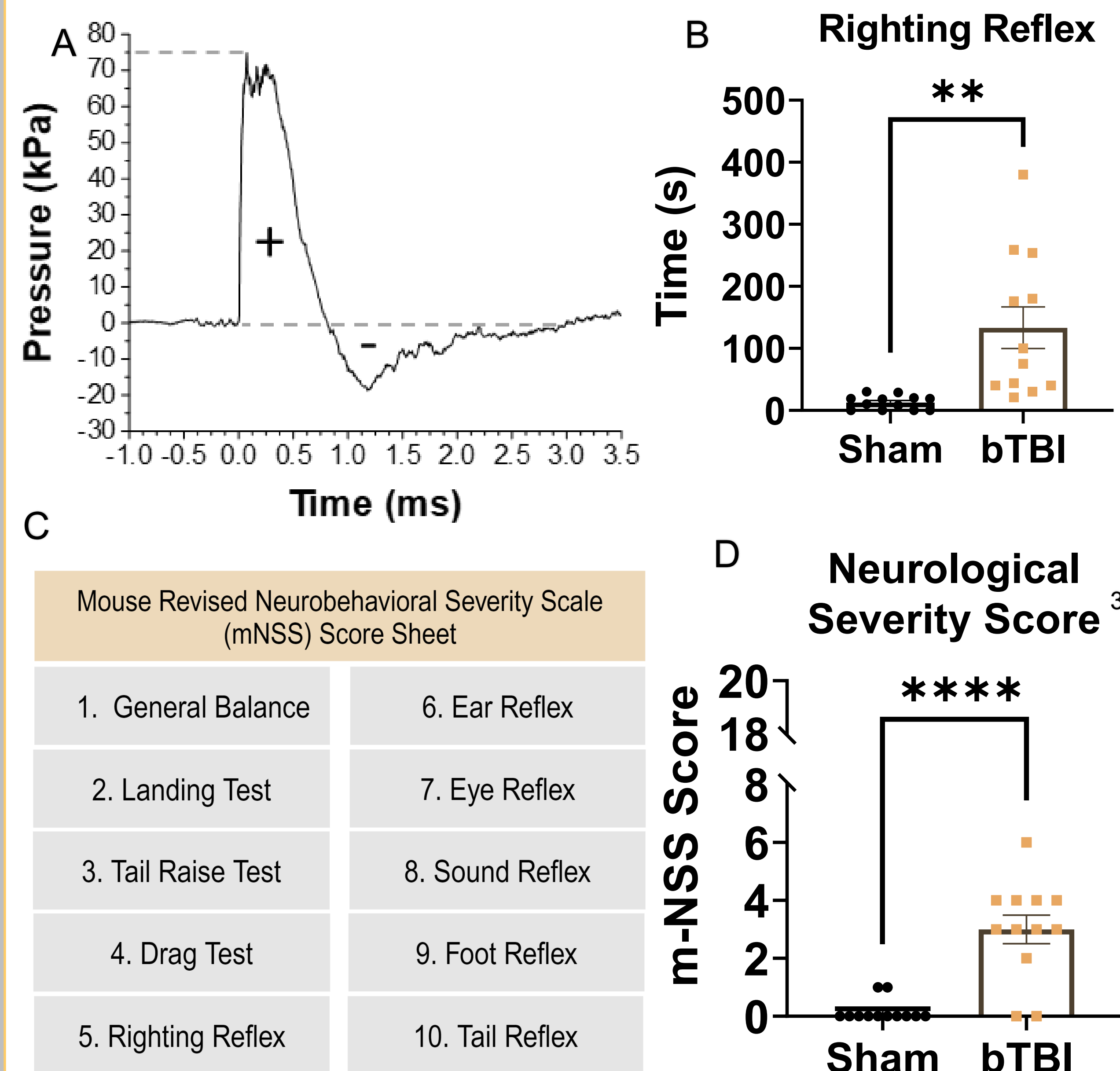


Fig. 2. Blast wave and bTBI severity characterization



RESULTS

Fig. 3. Acrolein-lysine adduct was differentially elevated in male and female mice at 1dpi

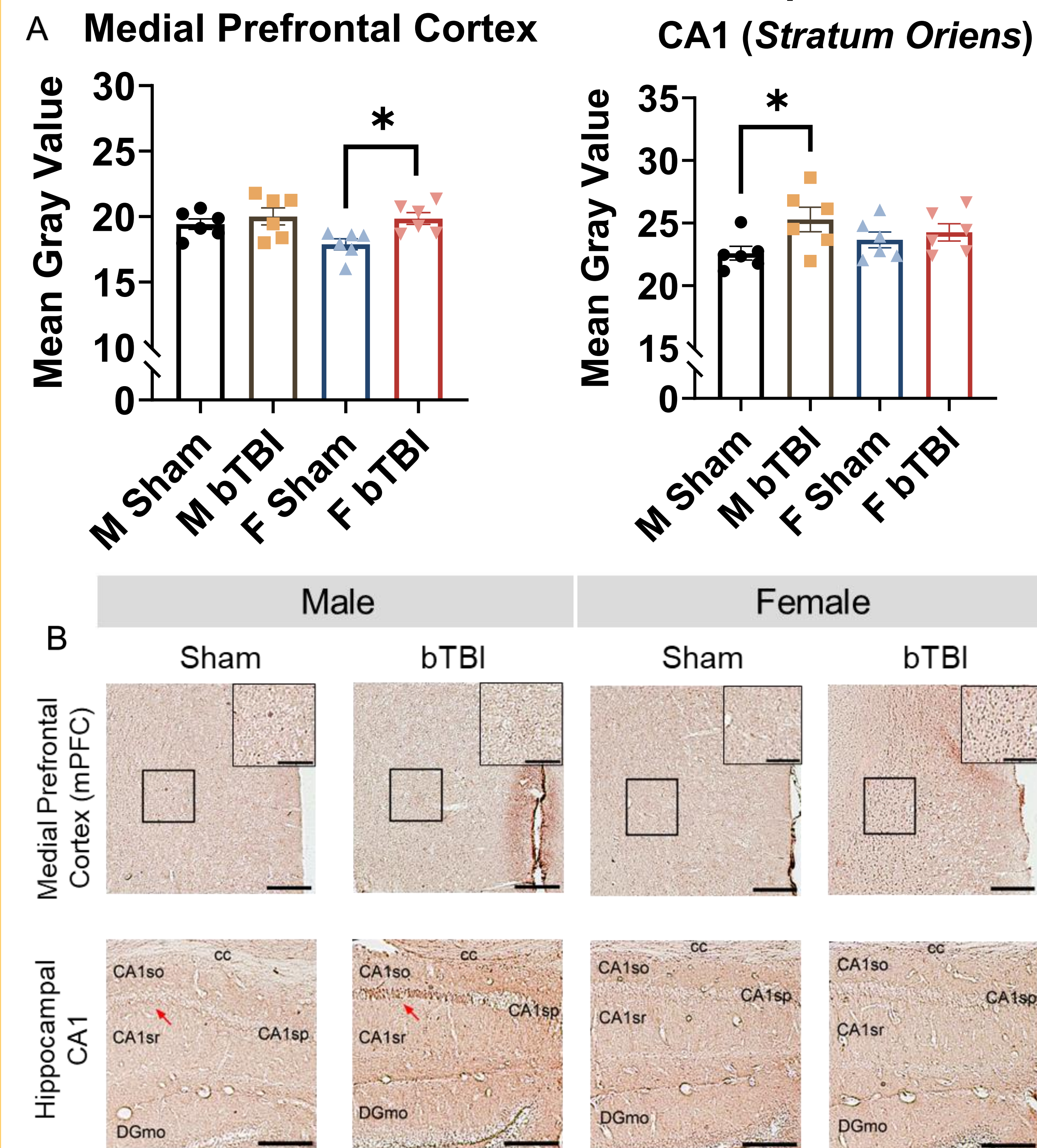


Fig. 4. Fear Conditioning and Response Protocol

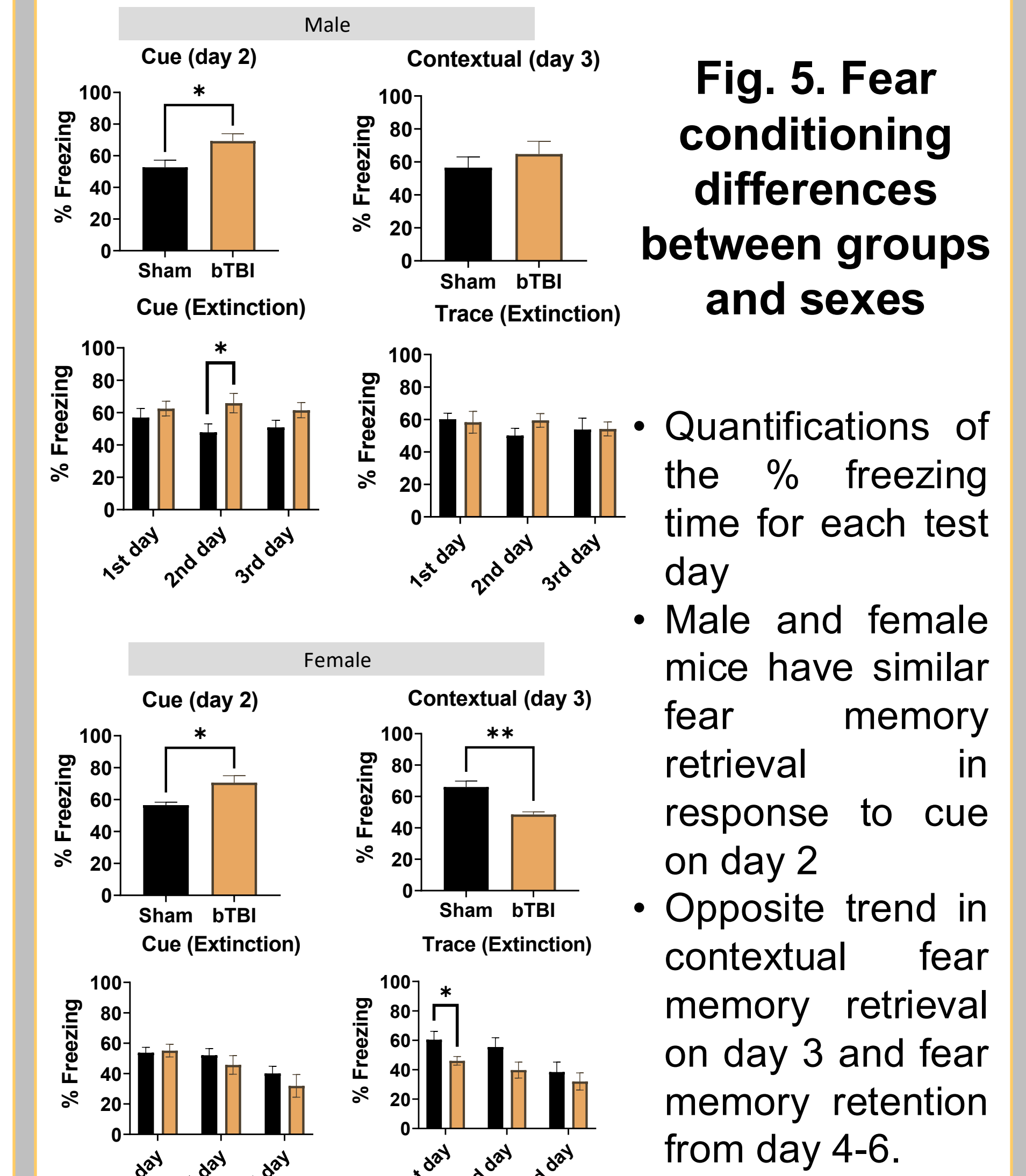
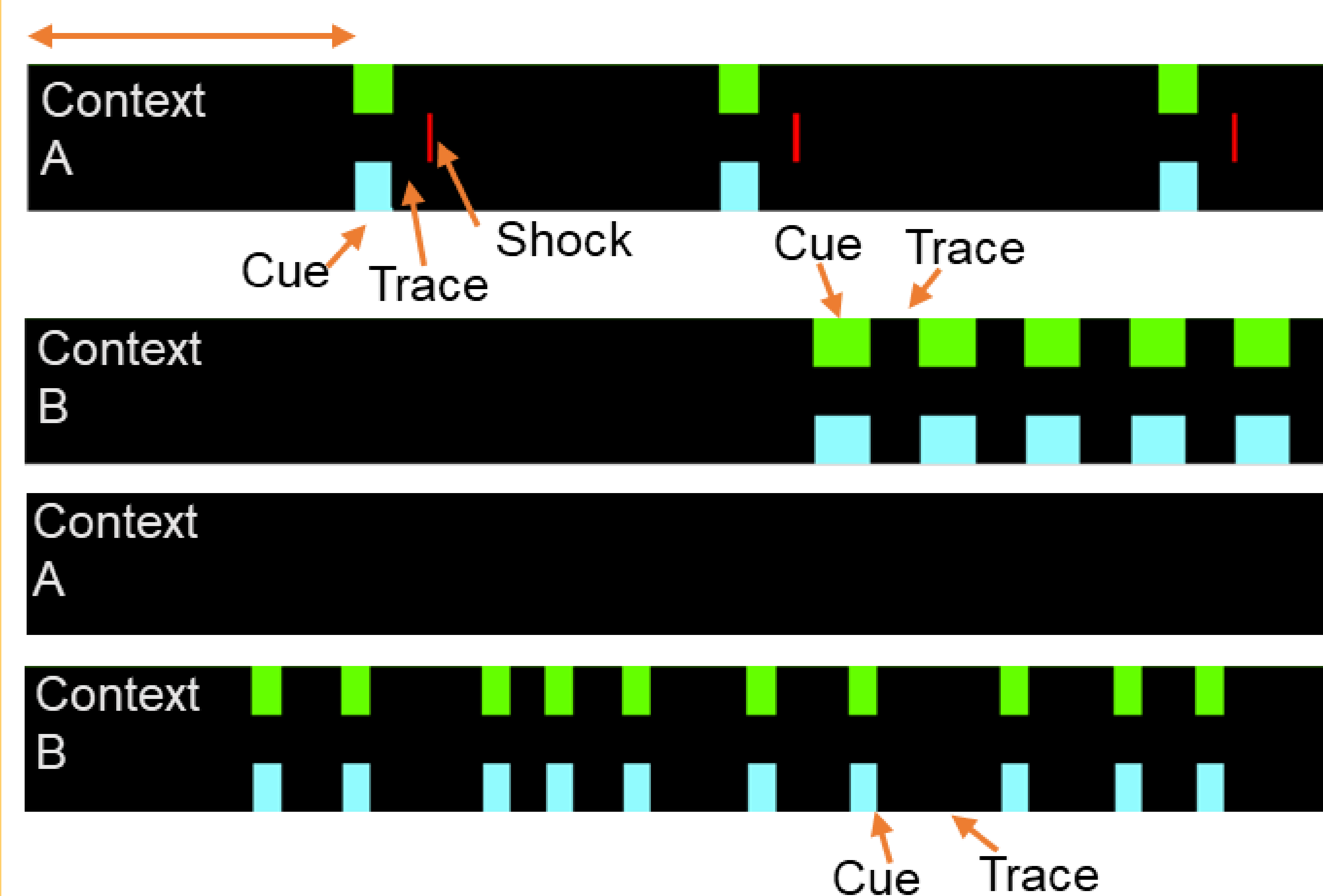


Fig. 5. Fear conditioning differences between groups and sexes

- Quantifications of the % freezing time for each test day
- Male and female mice have similar fear memory retrieval in response to cue on day 2
- Opposite trend in contextual fear memory retrieval on day 3 and fear memory retention from day 4-6.

CONCLUSIONS

- Sex-dependent differential response in oxidative stress and fear-related memory after repeated blast TBI in mice
- Biological sex is an important component in the underlying mechanism of bTBI-related neurological disorders⁴.

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