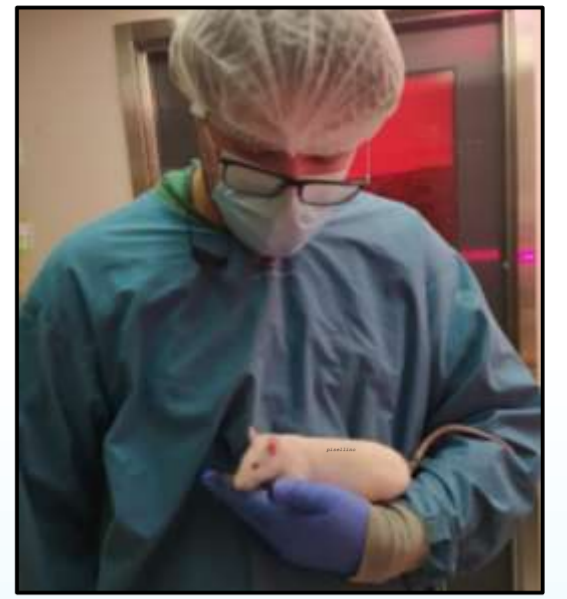


# Investigating the behavioural and physiological responses associated with observational fear memory



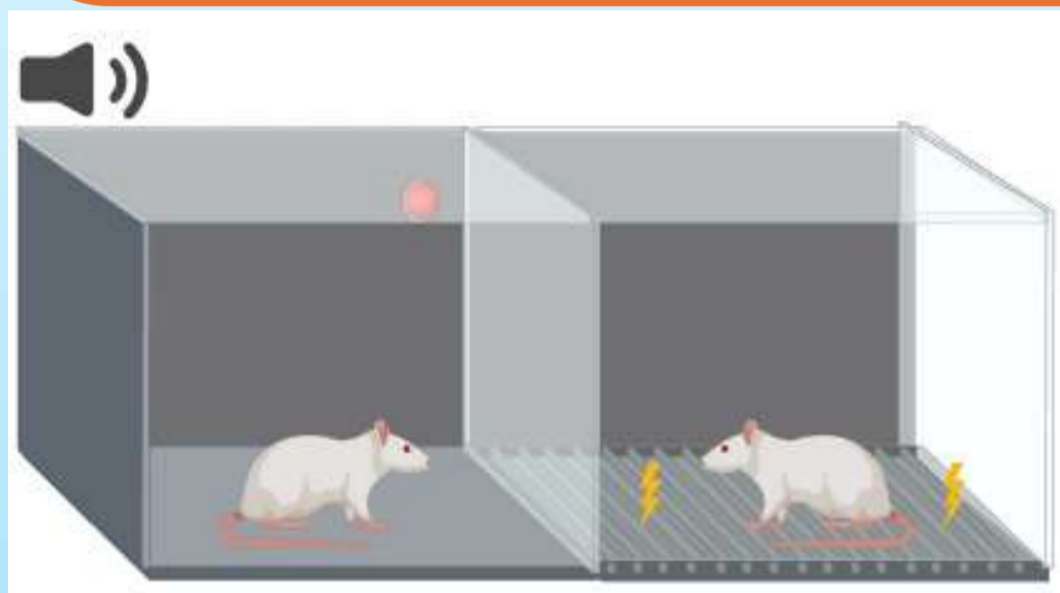
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## ESSENTIALS

**Observational fear** is the act of acquiring a fear stimulus through visual learning. Fear is measured with increases in **freezing behaviour**, but other behaviours could affect the fear evaluation. **Corticosterone** may also anticipate freezing responses. As an alternative evaluating method, **Operant fear** training can be used, where fear is measured by reduced **suppression ratio**. The injection of **Diazepam** is expected to tamper the fear response.

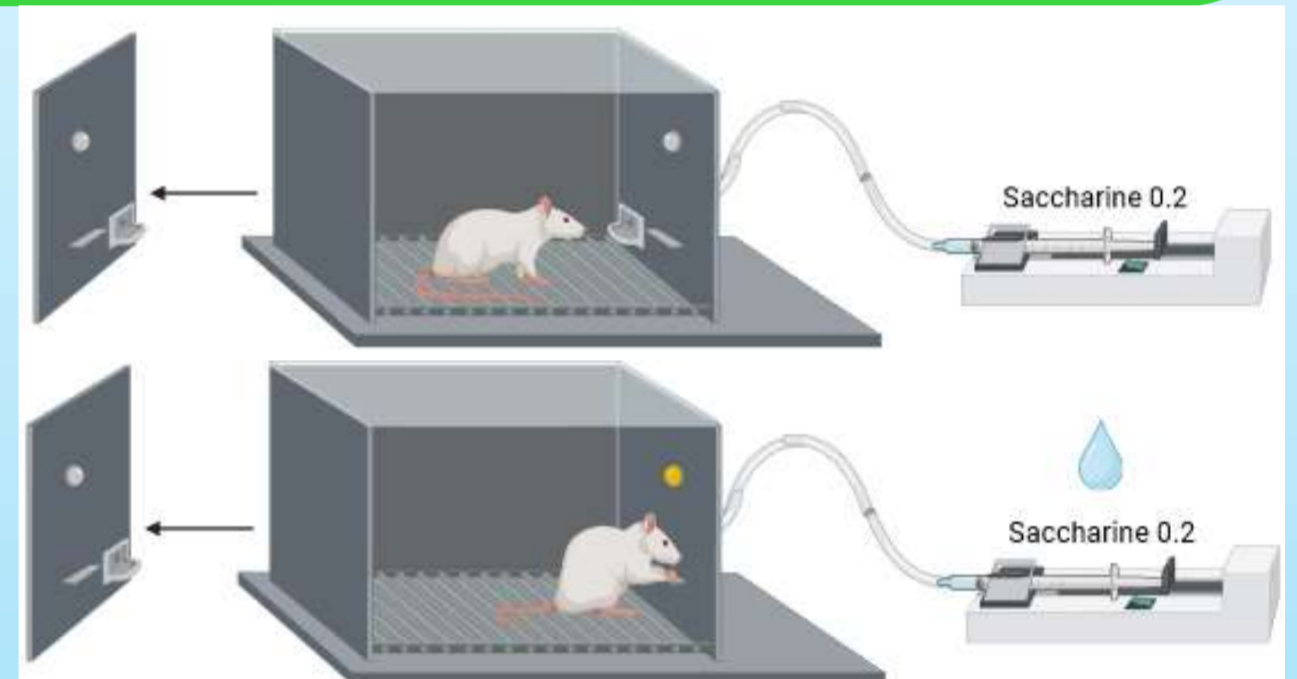
## OBSERVATIONAL FEAR METHOD

- Experiment done according to standard protocol\*.
- Additional corticosterone samples taken at four timepoints.
- Recordings of Fear acquisition and Fear Test used for scoring Freezing and behaviours.



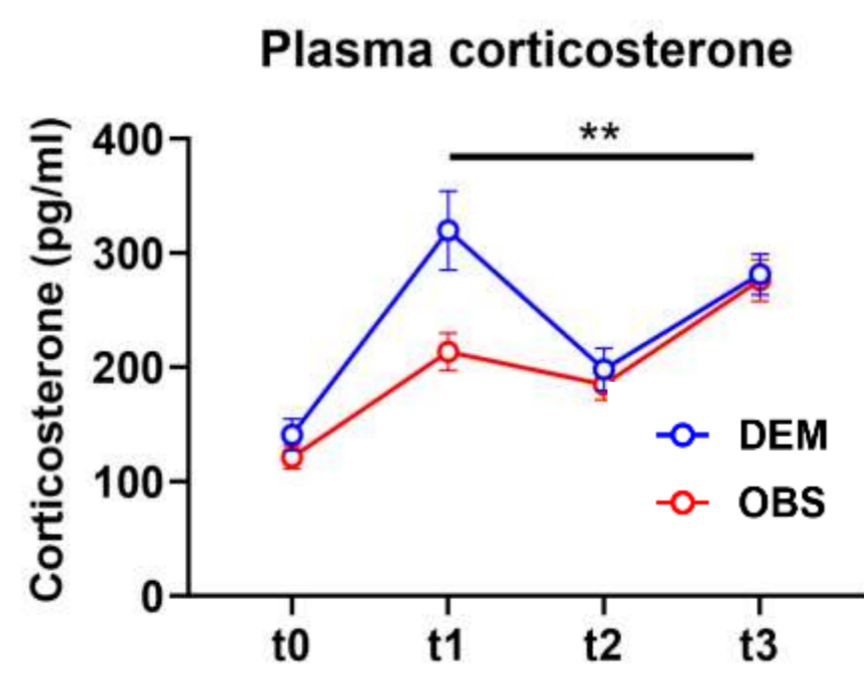
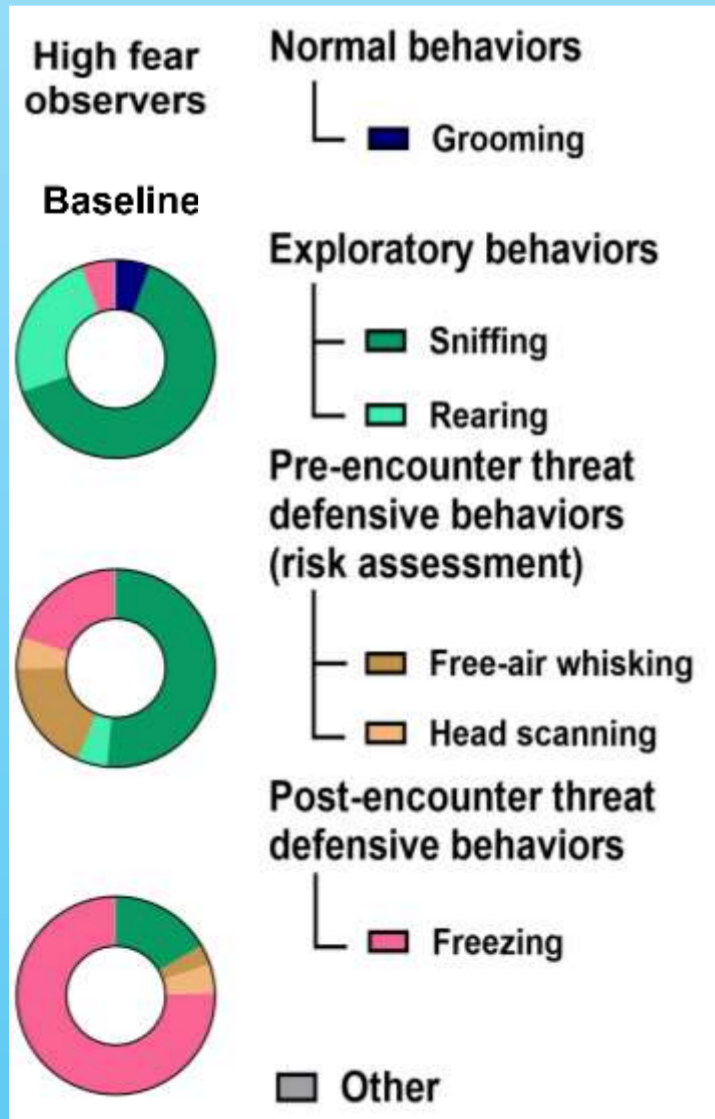
## OPERANT FEAR METHOD

- Experiment done according to standard protocol\*.
- Additional administration of Diazepam for influence on suppression ratio (SR).
- $SR = LP(Tone) - LP(Baseline) / LP(Tone) + LP(Baseline)$



## OBSERVATIONAL FEAR RESULTS

- Scoring subdivided in five groups (one reported). **Fear expressed** mainly through **freezing** but **other behaviours** are indicative of a stressing state (e.g. Free-air Whisking).
- **Corticosterone** follows **regular trend** but does not correlate with freezing.



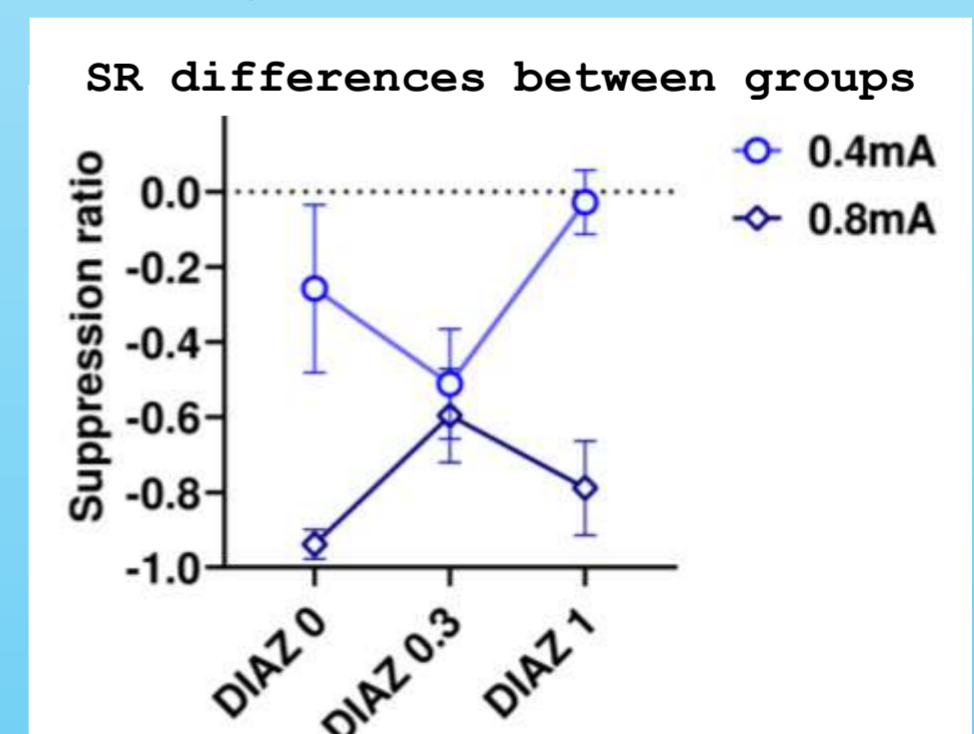
Level of significance:

- 0.05 = \*
- 0.001 = \*\*

- The **scoring results** are used to train an **AI** for behavioural facial recognition, fastening future scorings.
- While the **corticosterone** is used for measuring stress, it does **not predict** freezing response.

## OPERANT FEAR RESULTS

- Varying the amount of **Diazepam** confirmed variations in **suppression ratio** between the shock groups.



- **Suppression ratio** is a solid alternative, with **Diazepam** working as a tamper for the fear response.
- The possibility to improve the welfare of the animals used in the experiment should be discussed in future instances.