Alcohol use disorders (AUDs) and anxiety disorders in a rat model (*Rattus norvegicus*)

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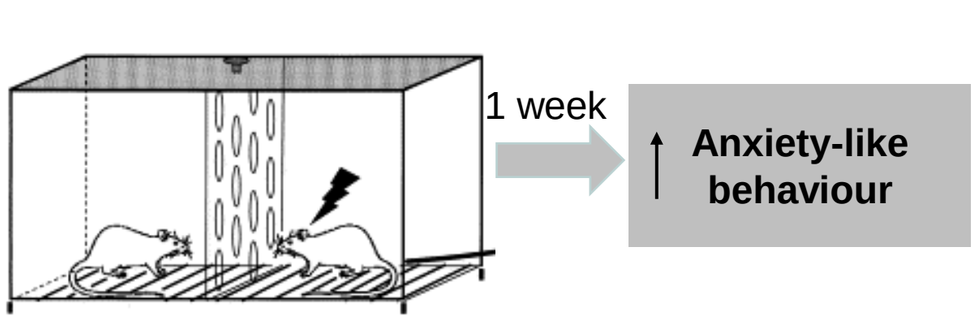
INTRODUCTION

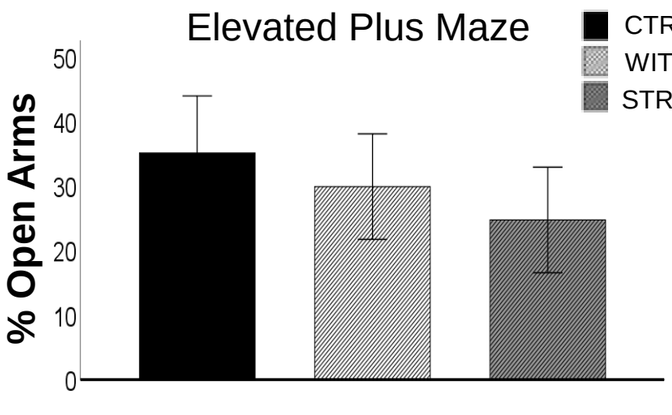
AUDs and anxiety disorders are highly comorbid in humans. Despite the evidence for neurological overlapping mechanisms between the two psychiatric disorders, molecular mechanisms are still not fully understood. Moreover, sex-specific effects of psychosocial stress over the pathophysiology of these disorders are understudied due to scarcity of valid animal models.

PSYCHOSOCIAL STRESS

Witnessing the traumatic experience of another individual can increase the risks to develop AUDs and anxiety disorders. In our study, we examined the behavioural effects of witnessing a conspecific exposed to foot shocks that, differently to other stressors (i.e. social defeat), are sensitive to sex differences.



We exposed male rats to five inescapable foot shocks for five consecutive days while another individual was forced to witness the scene. After one week we tested anxiety-like behaviour in elevated plus maze (EPM).

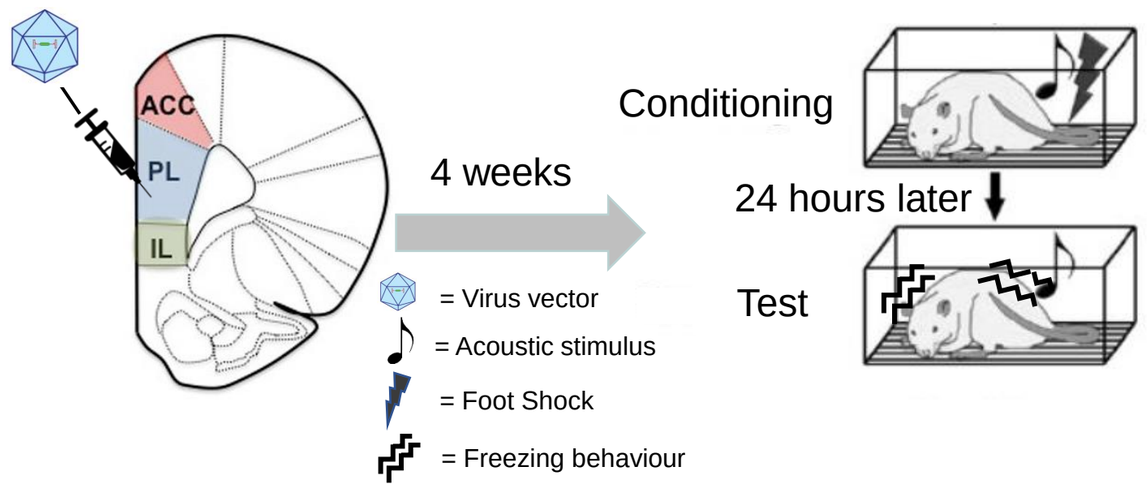


Average time spent in the open arms of EPM

Both witnesses and stressed subjects showed a tendency for higher anxiety-like behaviour after stress than controls.

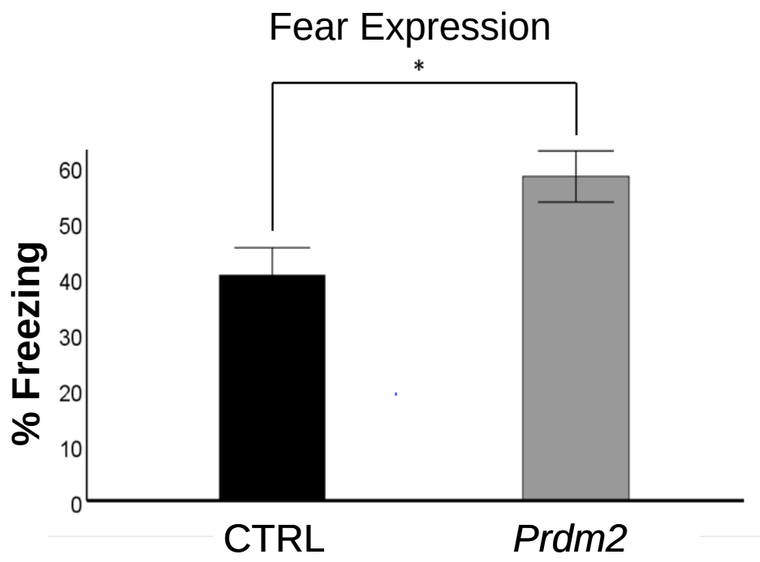
MOLECULAR MECHANISMS

In one study, we examined the role of *Prdm2,* a gene encoding for a histone methyltransferase downregulated in the mPFC of alcohol dependent rats, in fear behaviour, as a model for PTSD.



Four weeks after virus-induced *Prdm2* knockdown in the prelimbic cortex (*left*), we tested freezing behaviour in a cued fear conditioning paradigm (*right*).

Prdm2 knockdown rats showed significantly higher freezing behaviour than controls.



Average freezing behaviour in control (*black*) and *Prdm2* knockdown rats (*grey*)

CONCLUSIONS

We concluded that similar molecular mechanisms might mediate the pathophysiology of both AUDs and anxiety disorders. Moreover, we found that our model has a potentiality to replicate the findings from more validated models and to study sex-specific effects of psychosocial stress in the comorbidity of AUDs and anxiety disorders.

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