

Serine Racemase Expression During Post-Natal Development and Involvement of SR-Expressing Neurons in Fear Extinction Learning

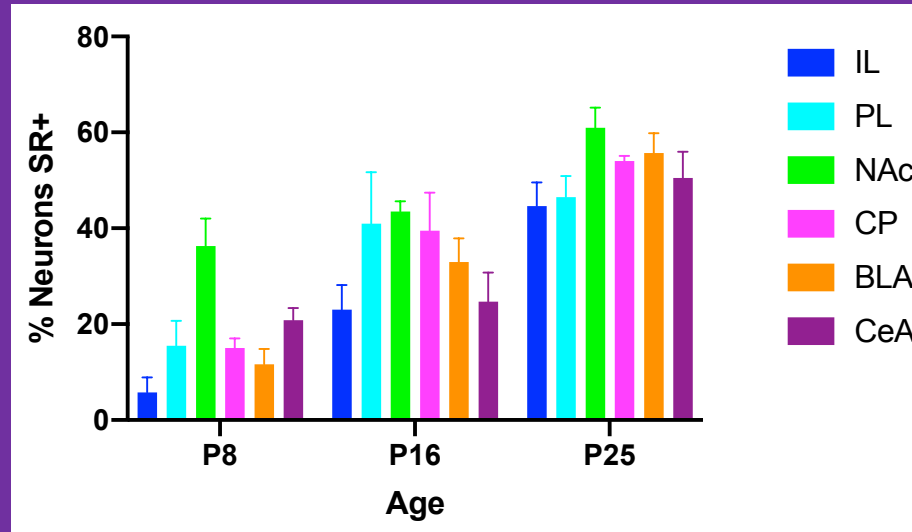
BACKGROUND

- Affects 1% of the population
- Severe symptoms make it a leading cause of disability worldwide
- Suicide and comorbidity rates are high
- Complex pathophysiology --> difficult to treat
- NMDARs: Ionotropic glutamate receptors responsible for synaptic plasticity
- NMDARs blocked/enhanced --> LTP decreases/increases
- SCZ brains show NMDAR hypofunction
- NMDARs require two agonists: glutamate and glycine/D-serine
- Serine Racemase (SR) converts L-serine to D-serine
- SR-/- mice show schizophrenic pathology

EXPERIMENT AIMS

1. How does SR expression change throughout postnatal development in wild-type mice?
2. Do fear learning and fear extinction activate discrete neural networks comprised of SR+ neurons?

Extinction Learning

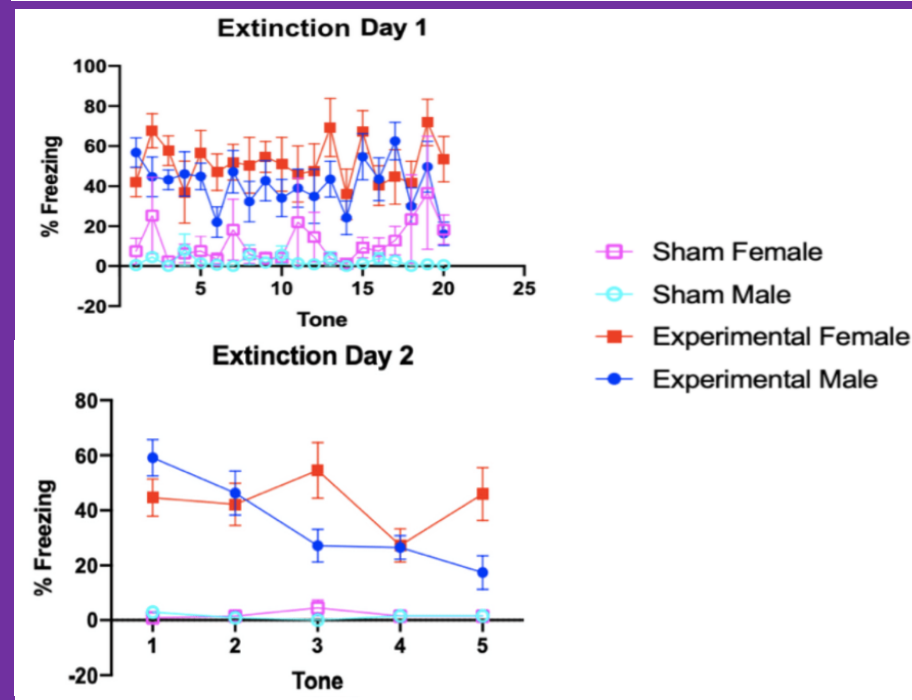


EXPERIMENT 1

- As age increases, % SR+ neurons increases
- The brain regions show different growth rates/patterns
- At P8, NAc expression is double that of any other brain region
- By P25/29, all regions show ~50% expression

FUTURE STUDIES

- Molecular mechanisms underlying increases in SR expression
- Reasons for the varying expression patterns and their effects on development



EXPERIMENT 2

- Sham Female increased freezing behavior
- Sham Female, Experimental Female and Experimental Male all showed unusual spiking freezing pattern
- Possible explanations
 - Estrous cycle
 - Experimental condition disturbances

FUTURE STUDIES

- Finish counting and analyze SR involvement in fear learning
- Reproduce unusual spiking patterns
- Explore possible reasons for spiking