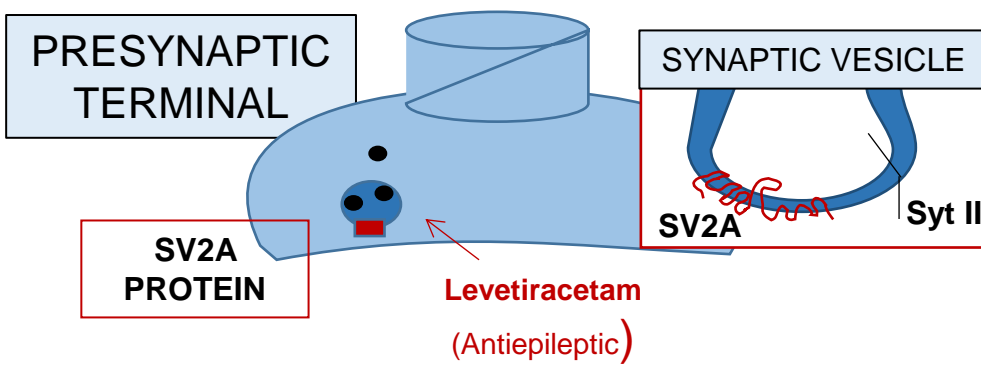


Decrease in SV2A expression in the hippocampus involves changes in cognition and anxiety-like features

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Introduction



SV2A PROTEIN

- ✓ Integral membrane protein, ubiquitously expressed and critical for the CNS functioning.
- ✓ **FUNCTION:** Vesicle fusion and Ca²⁺ modulation.

EPILEPSY

- ✓ Common neurological disorder with around **25%** of patients suffering drug-resistant epilepsy.
- ✓ **SYMPTOMS:** Seizures, cognitive impairments, mood disorders.

SV2A IN EPILEPSY

- ✓ Current antiepileptic drugs target the SV2A protein
- ✓ Homozygous SV2A KO mice suffer severe seizures at P7 and die at P21
- ✓ SV2A levels decrease in patients suffering chronic epilepsy

Methods

Is the SV2A protein implicated in the cognitive impairments detected in epilepsy?

MICE PRODUCTION

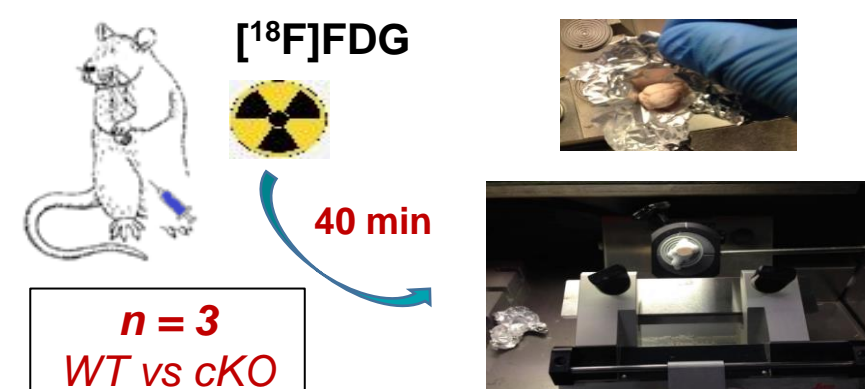
Cre/lox technique



Model validation with PCR, IHC and *in vitro* autoradiography with [¹⁸F]UCB-H

A) HIPPOCAMPAL METABOLISM

[¹⁸F]FDG ex-vivo autoradiography



B) BEHAVIOURAL AND COGNITIVE TESTS

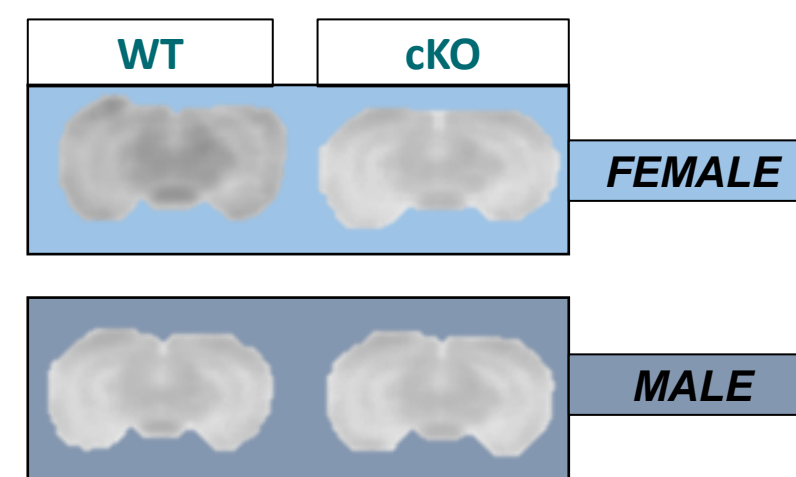
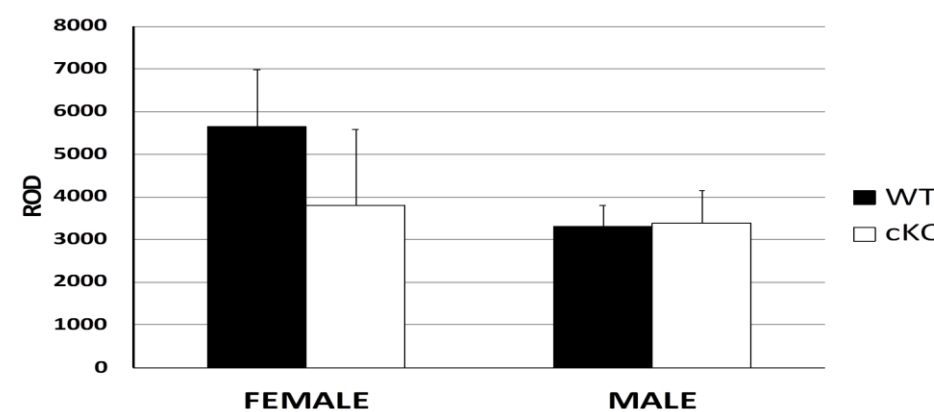


EPM: Elevated Plus Maze (Anxiety)
ACT: Activity chambers (Spontaneous activity)
CFC: Contextual Fear Conditioning (Memory)
BM: Barnes Maze (Spatial memory)

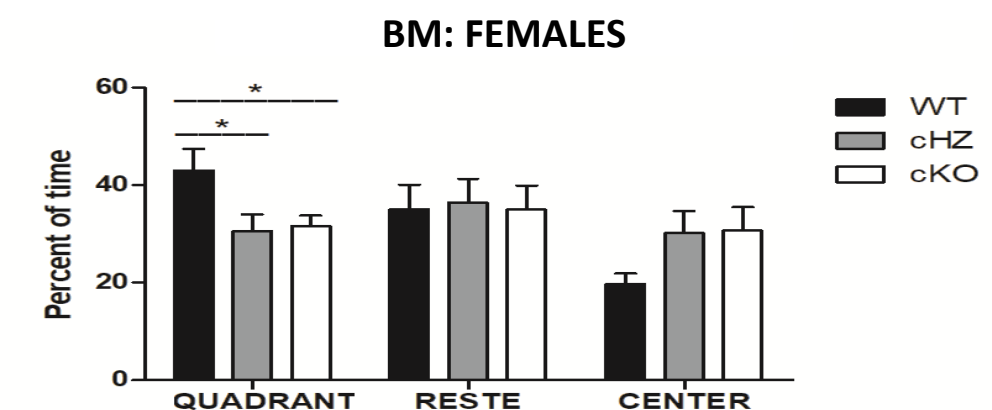
n = 21
(BM n = 9)
WT vs cHZ
vs cKO

Results

A) HIPPOCAMPAL METABOLISM



B) BEHAVIOURAL AND COGNITIVE TESTS



Conclusions

- ✓ The SV2A decrease seems not to modify the hippocampal metabolism.
- ✓ **BUT, it produces spatial memory problems and anxiety-related features.**
- ✓ A sexual dimorphism is present in the symptomatology

Lynch et al., 2004. Proc. Natl. Acad. Sci. U. S. A.; Lamberty et al., 2008. Behavioural brain research; Menten-Dedoyart et al., 2016. PloS one