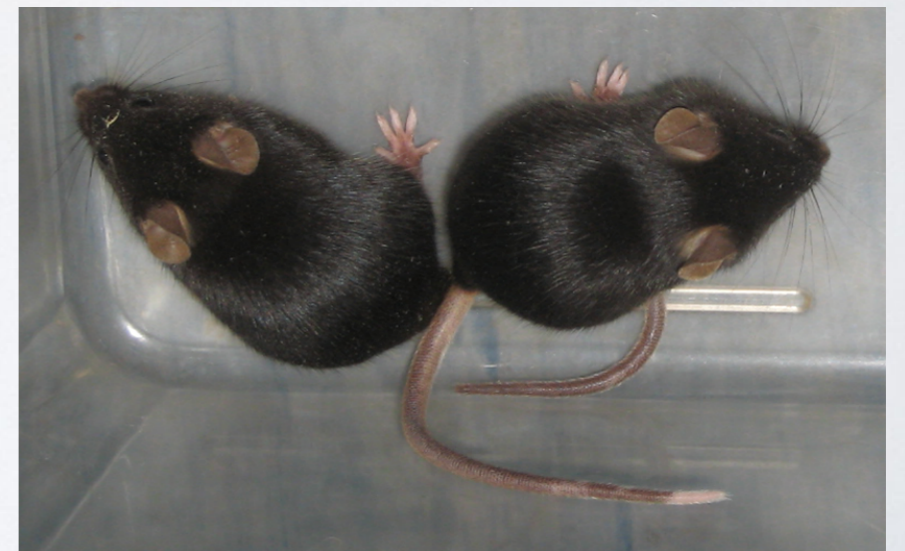


Cite this as: Hui-yu ZHANG, Yu-nan ZHAO, Zhong-li WANG, Yu-fang HUANG, 2015. Chronic corticosterone exposure reduces hippocampal glycogen level and induces depression-like behavior in mice. *Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology)*, **16**(1):62-69. [doi:10.1631/jzus.B1400166]

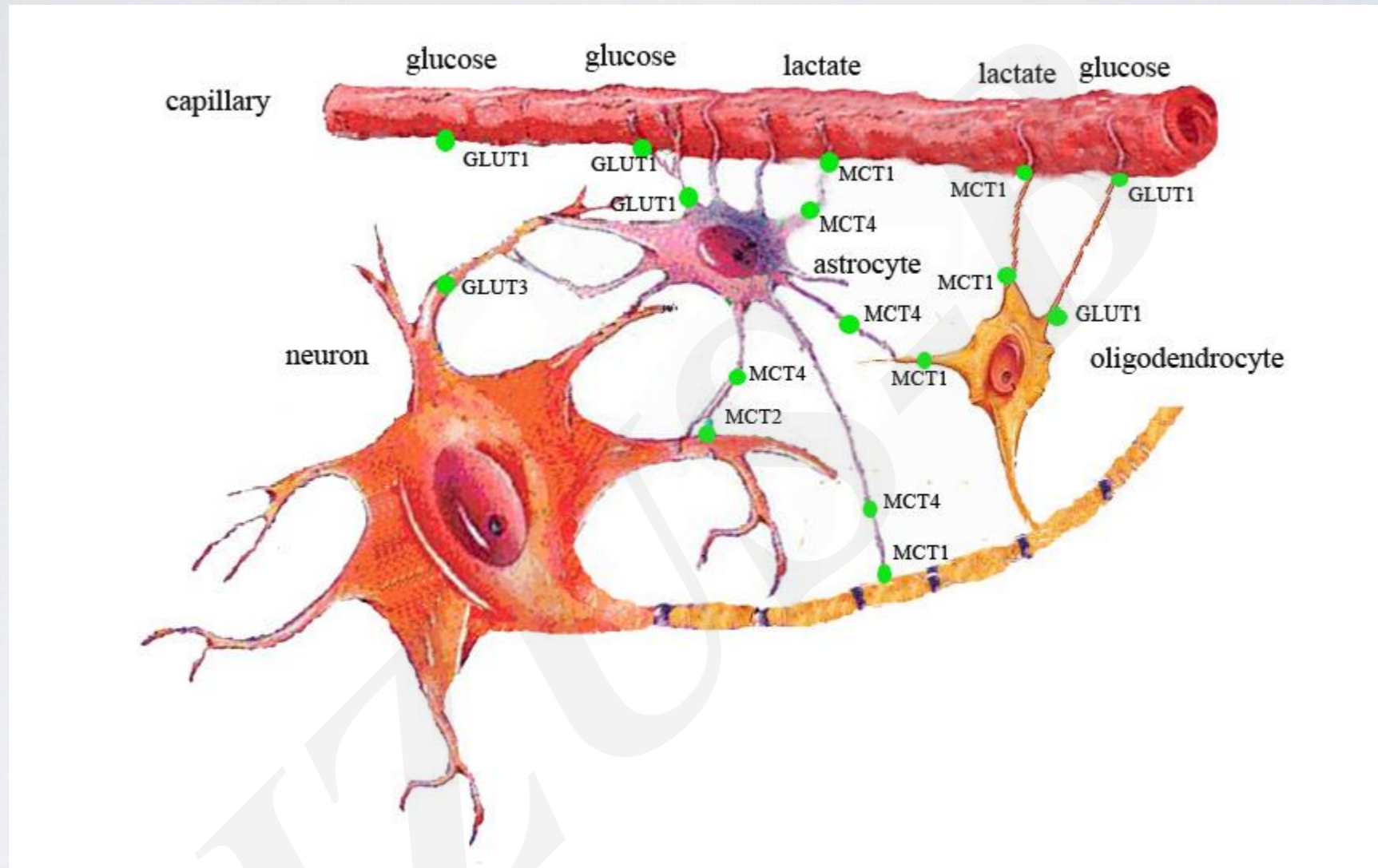
Chronic corticosterone exposure reduces hippocampal glycogen level and induces depression-like behavior in mice

Key words:

glycogen; corticosterone; stress; depression; hippocampus



Brain glycogen

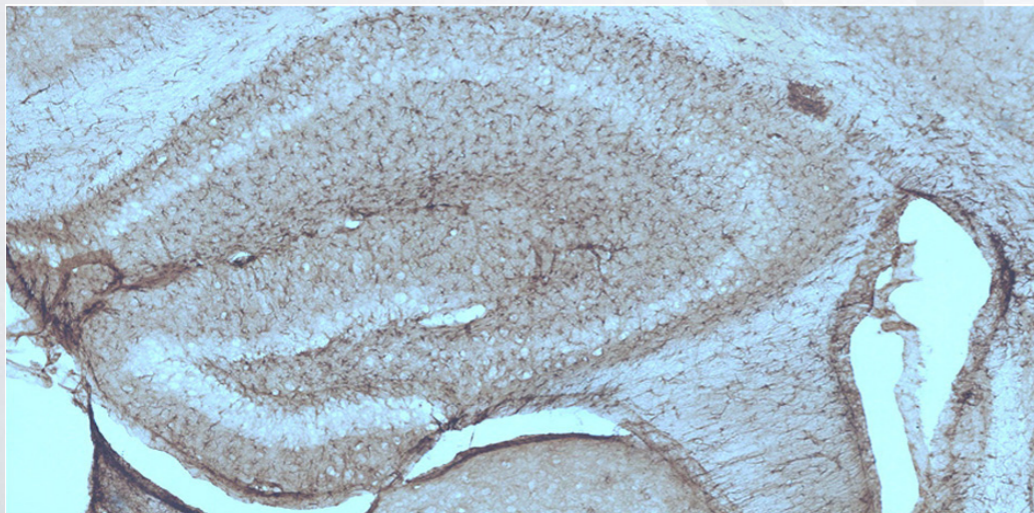
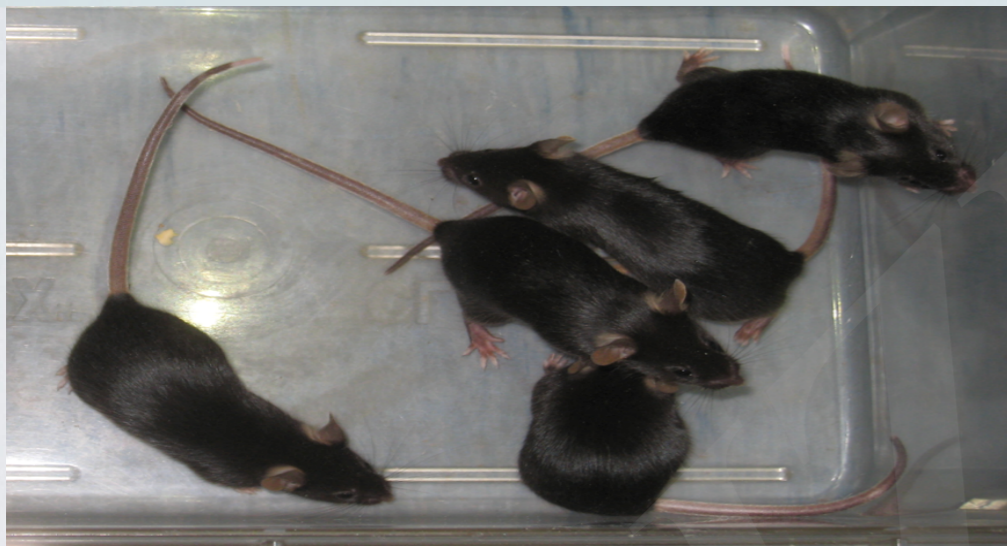


The glycogen can be rapidly metabolized to provide energy substrates when they are needed by neurons. Glycogen stored in astrocytes also provides additional energy for neurons when in great need (Suzuki et al., 2011).

Materials and methods

Experimental animals

- C57BL/6N mice



Research methods

- CORT administration
- Behavioral tests
- CORT assays
- Tissue glycogen assay
- Glycogen synthase assay
- Glycogen phosphorylase assay

Results

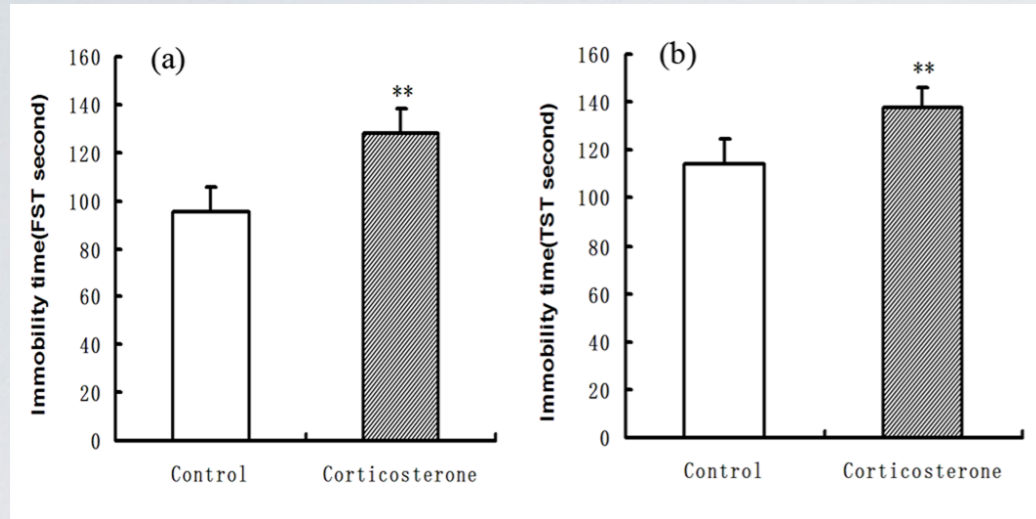


Fig. 1. Effects of repeated CORT injection on depression-like behavior in male mice in the FST and the TST

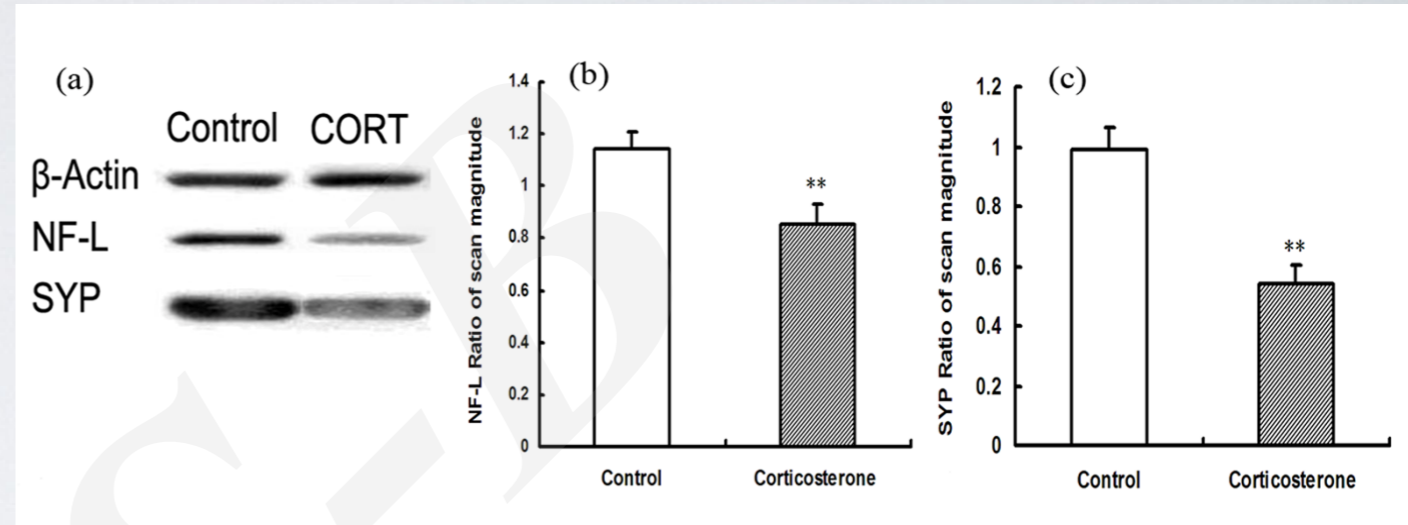


Fig. 3. Effects of repeated CORT injections on NF-L and SYP levels in the hippocampal tissues of mice

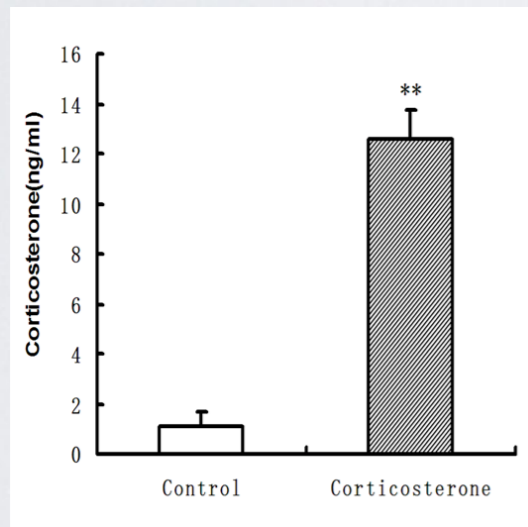


Fig. 2. Serum CORT levels in control (left) and CORT-injected (right) mice

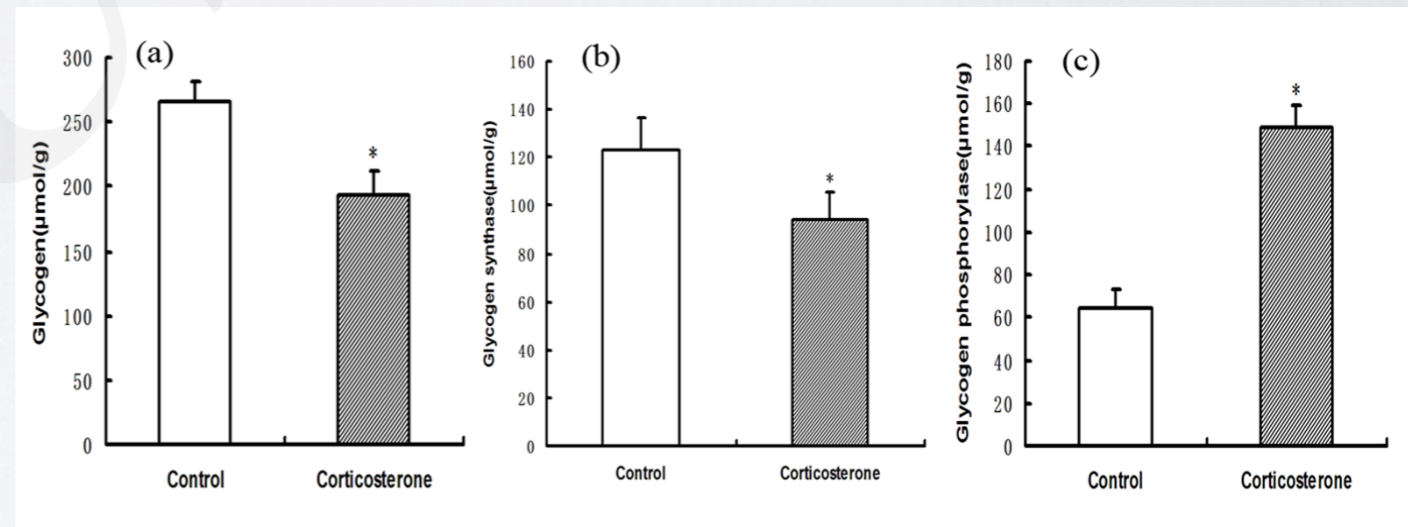


Fig. 4. Level of brain glycogen, glycogen synthase and glycogen phosphorylase in CORT-treated mice.

Conclusion

This study shows the effect of chronic CORT injections on the glycogen level of astrocytes in hippocampal tissues. The results showed that chronic CORT injection reduces NF-L and SYP levels, and induces depression-like behavior in mice. Chronic CORT injection decreased hippocampal glycogen level and glycogen synthase activity, but increased glycogen phosphorylase activity. This study suggests that the reduction of hippocampal glycogen level is a reason why chronic CORT treatment causes hippocampal neuron damage and induces depression-like behavior in male mice.