

Iron metabolism disturbance induced by repeated social defeat stress

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Acute stress activates sympathetic nervous system and endocrine system as a survival mechanism. However, prolonged or excess stress induces behavioral abnormalities and cognitive dysfunction.

We previously reported that repeated stress activates microglia via Toll-like receptor 2 and 4 to produce proinflammatory cytokines such as IL-1 α and TNF α in the medial prefrontal cortex, thereby leading to the induction of social avoidance. These results demonstrate that repeated stress induces inflammation-like response in the brain to induce behavioral changes. We also found that repeated stress promotes leukocytes infiltration to the brain parenchyma, suggesting the interaction between brain and peripheral immune systems.

As it is well-known that repeated stress is a risk factor not only for mental illnesses but also for cardiovascular disease and metabolic diseases, repeated stress perturbs the function of peripheral organs. Since repeated stress alters immune system through the activation of sympathetic nervous system, we analyzed peripheral blood. We found that repeated stress induces iron-deficiency anemia. In this symposium, I will introduce my recent work on repeated stress-induced disturbances in iron metabolism and discuss its behavioral relevance.