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## Hippocampal gene expression profiling in a rat model of functional constipation reveals abnormal expression genes associated with cognitive function

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### Highlights

- Pathogenesis of FC is considered from a new perspective of brain-gut interaction disorder;
- Transcriptomics method is used to study the effects of FC on hippocampus for the first time;
- The progress of FC might induce changes of cognitive function.

**Abstract:** Disease progress and pathological proceeding of functional gastrointestinal disorder (FGID) are considered to be closely related to disordered brain-gut interaction, but only a few researches reported the relationship of functional constipation (FC) and disordered brain-gut interaction. It has been found that FC has a great correlation with emotional problems in clinical patients, but its related mechanisms have not been clearly clarified. In order to explore the molecular pathogenesis of FC related to emotional problem, BGI-500 sequencing technology was used for the first time to study the transcriptomics changes of hippocampus in a rat model. The results showed that the differential expressed genes (DEGs) were mainly involved in the modulation of hemoglobin binding and oxidative stress. These changes could result in changes of hemoglobin content and quality, which could further induce the decreased oxygen-carrying function of erythrocytes. In biological pathway, the disorder of cholinergic system could be speculated through related DEGs. And then, those enriched DEGs were verified by qRT-PCR methods. As far as the mRNA expressions of *Chrna4*, *Camk2d* and *Gng13*, there were significant difference between the control rats and model rats. These results show that FC could

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