psychiatric disorders such as depression and anxiety disorder in human. The aim of the present study was to clarify emotional properties in rats repeatedly administered ACTH during the early postnatal period.

**Methods:** Tetracosactide, the N-terminal 24 amino acids of the naturally occurring ACTH, were administered once a day at dose of 100 μg to male rat pups for 5 days on the day 21 after birth (3wACTH). Saline-injected rats were subjected as a littermate control. Emotional properties in 6- and 10-week-old rats were evaluated by the elevated plus-maze test, novelty-suppressed feeding test and sucrose preference test. And we measured the wet weight of adrenal glands in 10-week-old rats.

**Results:** Plasma corticosterone in 3wACTH significantly increased, indicating stress exposure by pharmacological intervention. Three-wACTH showed decrease of time spent in the open arms (elevated plus-maze test), the longer latency to approach a food pellet in the novel environment (novelty-suppressed feeding test) and reduction for sucrose consumption (sucrose preference test). These abnormal behaviors in 3wACTH indicated the anxiety-like and/or depressive-like behaviors, which were observed in 10, but not 6 weeks old. Moreover, adrenomegaly observed in 10-week-old 3wACTH compared with control.

**Conclusions:** These findings suggest that pharmacological stress (namely ACTH administration) during early postnatal period might produce emotional abnormalities such as the anxiety-like and depressive-like behaviors in adulthood but not adolescent, with a critical developmental period.

## PS146

### Norbin: an emerging player in the pathophysiology and treatment of depression?

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**Objective:** The neuron specific protein Norbin has recently been implicated in the pathophysiology of depression (Wang et al, 2015). Norbin positively regulates metabotropic glutamate receptor 5 (mGluR5), which is also thought to be involved in depression and has been identified as a novel therapeutic target. The aim of this study was to examine the protein expression of Norbin in a neurodevelopmental rat model of depression, and determine if any alterations in Norbin were associated with mGluR5.

**Methods:** Brains were extracted from Sprague-Dawley (SD; healthy model) and Wistar–Kyoto (WKY; depression model) rats at postnatal days (PN) 14, 35, and 98 corresponding to juvenile, adolescent and adult time-points. Immunoblots were performed on prefrontal cortex (PFC) and hippocampal tissue to measure Norbin and mGluR5 protein levels.

**Results:** Norbin was expressed in both the hippocampus and PFC at all three developmental stages in both rat strains. In the hippocampus, there was a reduction in Norbin protein levels in WKY compared to SD rats, specifically at the adolescent time point (-38%). This was associated with a change in mGluR5 expression at this time point; we observed a reduction in mGluR5 dimer levels (-57%) and an increase in mGluR5 monomer expression, which remained in the adult brain (>100%). In the PFC, Norbin was dramatically increased at adolescence and adulthood in WKY rats compared to SD rats (>100%). While mGluR5 monomer levels were increased at adulthood in the PFC, no significant changes in dimeric expression were observed at any time point examined.

**Conclusion:** These findings provide support for an involvement of Norbin in the pathophysiology of depression. While further studies are required to determine the implications of these differences in Norbin and mGluR5 in WKY rats, targeting mGluR5 or Norbin at adolescence may represent an alternative therapeutic approach for the treatment of depression.

## PS147

### Gunn rats show depression-like behavior and microglial activation in the hippocampus

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**Abstract**

Recent studies imply that glial activation play a role in the pathogenesis of psychiatric disorders, such as schizophrenia and affective disorder. Although a number of animal studies have attempted to establish appropriate animal models for these psychiatric diseases, the numbers of established models, which show signs or symptoms relevant to the diseases, are limited. We have previously demonstrated that Gunn rats with hyperbilirubinemia show congenital gliosis and schizophrenia-like behavior. Since it is suggested that major depression involves glial activation, we examined whether Gunn rats show depression-like behavior using the forced swimming test (FST) and the tail suspension test (TST). In addition, we quantitatively evaluated microgliosis in the hippocampus of Gunn rats using immunohistochemistry analysis with the microglial marker ionized calcium binding adaptor molecule (IBA)-1.

We employed male homozygous (j/j) Gunn rats and male Wistar rats as normal control individuals. They were all 7 weeks old. In the FST, rats were placed into the water (25 ± 1 °C) for 15 min. After 24 hours from the habituation, rats wereput into the water for 6 min.In the TST, rats were suspended from the tail for 5min. All the session were recorded by a video camera. The duration of immobility was measured based on the recorded movie.

Both the FST and TST showed that immobility time of Gunn rats was significantly longer than that of Wistar rats, indicating that Gunn rats have depression-like behavior. The quantitative immunohistochemistry analysis using Image J revealed that hippocampal immunoreactivity for IBA-1 was significantly increased in Gunn rats compared to Wistar rats. These results suggest that Gunn rat could be an animal model of depressive symptoms and activated microglia.

## PS148

### Repeated restraint stress induces alteration in maturation makers of dentate gyrus neurons in BALB/c mice

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**Abstract**

Stress is widely accepted as a predisposing environmental factor in psychiatric disorders, including depression and schizophrenia. We previously found “immature dentate gyrus (iDG)”, in which almost all the granule cells in the hippocampal dentate