**P-27** Effects of voluntary exercise on food intake and anxiety-related behaviors

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**Purpose:** Our goal in this study was to examine the effects of voluntary exercise on feeding behavior and anxiety-related behaviors, as well as neural activities.

**Methods:** Male Wistar rats (8-w old) were housed in individual cages with attached running wheels (exercised group, n = 3) or without running wheels (control group, n = 3) for 4 wks. Amount of food consumption was recorded every 24 hrs. After 4 wks of each housing condition, we conducted elevated plus-maze test and open field test in order to examine anxiety-related behaviors. Immunohistochemical staining method on FosB protein was used to detect neural activities related to the changes in feeding and anxiety induced by voluntary exercise.

**Results and Discussion:** Food intake of exercised group started to decrease in the 1st week of housing period, exhibiting significantly less food intake in the 2nd and 3rd week compared to control group. By the 4th week, food intake of exercised group gradually increased to approximately the same level of control group. According to the outcomes of behavioral tests, exercised group tended to show less anxiety related behaviors than control group. In conclusion, voluntary exercise inhibited food intake temporarily and diminished anxiety. Our study suggested that voluntary exercise might modify food intake through emotional changes.

Key Words: voluntary exercise, food intake, anxiety-related behavior

**P-28** Effects of different intensity of acute exercise on depression-like behavior and neuronal activity in rats

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**Purpose:** Physical exercise has been suggested to result in improved stress-related psychiatric disorders such as depression, i.e., antidepressant effect, though the neural mechanisms are still unclear. Unfortunately, few general concepts for the optimal regimens of physical exercise for the pathology of depression have been developed. In this study, we examined the effects of different intensity of acute exercise on depression-like behavior and neuronal activity involved in stress and antidepressant properties.

**Methods:** Fifteen adult male Wistar rats (weighing 220-295g) were used for the experiments. The rats were randomly assigned to one of three groups: sedentary controls, low-speed runners (15m/min) and high-speed runners (25m/min), and performed a 30-min treadmill running. After the acute exercise, the forced swim test was performed to assess the depression-like behavior. In addition, we examined the neuronal activities in the midbrain dorsal raphe nucleus (DRN) and the hypothalamic paraventricular nucleus (PVN), using c-Fos immunohistochemistry.

**Results and Discussion:** High-speed running strongly activated PVN neurons, and increased the depression-like behavior. On the other hand, low-speed running significantly increased the activity of DRN serotonin neurons compared to that in high-speed running, without a strong activation of PVN neurons. These results suggest that physical exercise with less stress, such as low-speed running, may be more efficient for reducing the incidence and symptom of depression.

Key Word: Depression, Exercise intensity, Serotonin