

International Conference on

# Environmental Toxicology and Pharmacology

February 21-22, 2019 | Paris, France

## Antidepressant-like effects of HSR extract in a Restraint-Induced Chronic Stress model

**Mi Young Lee**

Korea Institute of Oriental Medicine, South Korea

Corticosterone signaling is involved in stress and depression, as well as in depression pathophysiology. Using an animal model of restraint stress, we investigated the effects of HSR on depressive-like behaviors and on the expression levels of serotonin, corticosterone, and neurotrophic factors in the brain. The mice were exposed to restraint stress for 2 h per day over a period of 3 weeks and orally treated with HSR (100, 200, or 400 mg/kg/day). Administration of HSR not only reduced the immobility

times of the restraint-stressed mice in the forced swimming and tail suspension tests but also significantly increased sucrose preference in the sucrose preference test. HSR also significantly reduced the levels of corticosterone and increased the levels of serotonin in the plasma. The extract also increased the phosphorylation level of cyclic AMP response element-binding (CREB) protein and the expression level of brain-derived neurotrophic factor (BDNF).

e: mylee@kiom.re.kr

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