Allantoin Activates PI3K/Akt/mTOR pathway to Improve Symptoms of Unpredictable Chronic Mild Stress-Induced Depression in Rats

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Background: Allantoin, an active component of Talinum triangulare, was reported to possess anti-oxidative and anti-inflammatory activities. In the present study, we investigated whether allantoin affects depression behavior in stress-induced depression-like rat.

Methods: We established the rat model of chronic unpredictable mild stress to simulate depression. Sucrose preference test (SPT) and forced swim test (FST), were used to assess depressive-like behaviors. The expression of PI3K/Akt/TOR was detected by western blot.

Results: The allantoin significantly increased sucrose consumption in sucrose preference test (SPT) and immobility time of forced swimming test (FST) in unpredictable chronic mild stress-induced depression-like rat. Allantoin also increased the expression of phosphorylated phosphatidylinositol 3-kinase (PI3K), phosphorylated protein kinase B (Akt) and mechanistic target of rapamycin (mTOR), PI3K/Akt/mTOR using Western blots in brain. Taken together, we found that allantoin possessed anti-depressive activity in stress-induced depression rats via increasing the expressions of PI3K/Akt/mTOR in the brain.

Conclusions: Allantoin may be developed as a potential anti-depressant in the future.