

## Protocatechuic Acid Ameliorates Chronic Unpredictable Mild Stress Induced Depressive-Like Behavior in Mice

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### Abstract

**Statement of the Problem:** Protocatechuic acid (PCA), a natural flavonoid elicited antidepressant-like activity in acute stress-induced depression. Amelioration of oxidative stress via promoting the endogenous antioxidant system and enhancement of monoamines in brain were the important underlying antidepressant mechanism of PCA.

**Methodology & Theoretical Orientation:** Depressive-like behaviors were induced by subjected mice to the CUMS protocol for 4 weeks. PCA was administered at doses of 100 and 200 mg/kg per oral and behavioral alterations (sucrose preference, immobility time, exploratory behavior) and biochemical changes mainly (serum corticosterone, monoamines, BDNF, inflammatory cytokines, TNF- $\alpha$ , IL-6, antioxidants parameters) in the hippocampus and cerebral cortex were investigated.

**Findings:** Experimental findings revealed that CUMS subjected mice induce significant impairment in behavioral alterations, mainly increased immobility time, impaired preference to the sucrose solution, monoamines, BDNF levels and serum corticosterone, cytokines, MDA formation with impaired antioxidants in the hippocampus and cerebral cortex.

**Conclusion & Significance:** Hence, the present findings demonstrated the antidepressant potential of PCA which is largely achieved probably through improving monoaminergic, BDNF and by modulation of the oxidative stress response, cytokines systems, and antioxidant defense system in mice.

rodents. His area of interest is Neurobiology largely focused on investigation of mechanism of action responsible for depression and associated symptoms.

### Speaker Publications:

1. Thakare VN, Dhakane VD, Patel BM. (2016). Potential antidepressant-like activity of silymarin in the acute restraint stress in mice: Modulation of corticosterone and oxidative stress response in cerebral cortex and hippocampus. *Pharmacol. Rep* 2016; 68, 1020-1027.
2. Thakare VN, Patel MB (2015). Potential targets for the development of novel antidepressants: future perspectives *CNS Neurol Disord Drug Targets*.14:270-281.
3. Weng L, Guo X, Li Y, Yang X, Han Y. (2016). Apigenin reverses depression-like behavior induced by chronic corticosterone treatment in mice. *Eur. J. Pharmacol.* : 774, 50-54.
4. Thakare VN, Patel BM. (2015). Potential targets for the development of novel antidepressants: future perspective *CNS. Neurol. Disord. Drug. Targets*. 205:14, 270-281.
5. Thakare VN, Dhakane VD, Patel BM (2017). Attenuation of acute restraint stress-induced depressive like behavior and hippocampal alterations with Protocatechuic acid treatment in mice *Met. Brain Dis.* 32: 401-413.

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### Biography:

Vishnu N Thakare has expertise in screening of natural drug candidates in experimentally induced depressive behaviour in