

## Protocatechuic acid ameliorates chronic unpredictable mild stress induced depressive-like behavior in mice

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**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. The aim of the present study is to explore the potential antidepressant mechanism(s) PCA in chronic unpredictable mild stress (CUMS) mice.

**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. Administration of PCA to CUMS mice attenuated the immobility time and serum corticosterone, cytokines TNF- $\alpha$  and IL-6, MDA) and improved sucrose preference, monoamines, and BDNF level.

**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.

### Recent Publications:

- 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.
- Thakare VN, Patel MB (2015). Potential targets for the development of novel antidepressants: future perspectives *CNS Neurol Disord Drug Targets*.14:270-281.
- 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.

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- Thakare VN, Patel BM. (2015). Potential targets for the development of novel antidepressants: future perspective CNS. *Neurol. Disord. Drug. Targets.* 2015;14, 270-281.
- 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.

## Biography

Vishnu N Thakare has expertise in screening of natural drug candidates in experimentally induced depressive behaviour in rodents. His area of interest is Neurobiology largely focused on investigation of mechanism of action responsible for depression and associated symptoms. Dr. Thakare's recent work is study of PCA and silymarin in depression and focusing on underlying mechanism of action. Further, he is also working on investigating novel mechanism of action antidepressant potential of piperine. Now, Dr. Thakare is future work is to understand the sleep pattern in depressive behaviour and natural compound to improve the sleep pattern in depressive condition and thus improve cognitive disturbances in such conditions.

## Notes: