

# 5<sup>th</sup> International Summit on Mental Disorders and Illness May 29-30, 2024 | Webinar

Volume : 09

## Betanin improves motor function and alleviates experimental Parkinsonism via downregulation of TLR4/MyD88/NF- $\kappa$ B pathway: Molecular docking and biological investigations

Sawsan A Zaitone, Md, Psych

Department of Pharmacology & Toxicology, Faculty of Pharmacy, University of Tabuk, Saudi Arabia

Parkinson's disease (PD) is a progressive **neuroinflammatory and degenerative disease**. In this study, we investigated the neuroprotective action of betanin in the rotenone-induced Parkinson-like mice model. Twenty-eight adult male Swiss albino mice were divided into four groups: Vehicle, Rotenone, Rotenone + Betanin 50 mg/kg, and Rotenone + Betanin 100 mg/kg. Parkinsonism was induced by subcutaneous injection of 9 doses of rotenone (1 mg/kg/48 h) plus betanin at 50 and 100 mg/kg/48 h in rotenone + betanin groups for twenty days. Motor dysfunction was assessed after the end of the therapeutic period using the pole, rotarod, open-field, grid, and cylinder tests. Malondialdehyde, reduced glutathione (GSH), Toll-like receptor 4 (TLR4), myeloid differentiation primary response-88 (MyD88), nuclear factor kappa- B (NF- $\kappa$ B), neuronal degeneration in the **striatum were evaluated**. In addition, we assessed the immunohistochemical densities of tyrosine hydroxylase (TH) in Str and in substantia nigra compacta (SNpc). Our results showed that rotenone remarkably decreased (results of tests), increased decreased TH density with a significant increase in MDA, TLR4, MyD88, NF- $\kappa$ B, and a decrease in GSH ( $p < 0.05$ ). Treatment with betanin significantly results of tests), increased TH density. Furthermore, betanin significantly downregulated malondialdehyde and improved GSH. Additionally, the expression of TLR4, MyD88, and NF- $\kappa$ B was significantly alleviated. Betanin's powerful antioxidative and anti-inflammatory properties can be related to its neuroprotective potential as well as its ability to delay or prevent neurodegeneration in PD.

### Biography

Dr. Sawsan Zaitone is a Professor of Pharmacology & Toxicology at the University of Tabuk and she is interested in research projects about in neurologic disorders and diabetes complications and creation of new treatment modalities for solving these critical problems.

[szaitone@ut.edu.sa](mailto:szaitone@ut.edu.sa)

Abstract received : February 06, 2024 | Abstract accepted : February 08, 2024 | Abstract published : 06-06-2024