

Recent Trends in Life Sciences

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## Cholesterol and Parkinson's disease: An update

Anupom Borah\*, Banashree Chetia Phukan<sup>1</sup>, Rajib Paul<sup>2</sup>

### Abstract

Several endogenous molecules including cholesterol have been implicated in the pathogenesis of Parkinson's disease (PD). Epidemiological and studies in animal models have provided a strong link between elevated cholesterol (hypercholesterolemia) and incidence of similar parkinsonian pathologies starting from behavioural abnormalities to biochemical lesions in brain. Moreover, the oxidation product of cholesterol, oxysterols are reported to trigger neurochemical alterations similar to that observed in PD. Recent studies highlighted the involvement of oxidative stress, mitochondrial dysfunction, and neuroinflammation as the mechanisms underlying neurotoxicity in PD induced by hypercholesterolemia or oxysterols. The chapter described all the evident mechanisms triggered by hypercholesterolemia and oxysterol in brain with special emphasis on their contribution towards pathogenesis of PD.

**Keywords:** Hypercholesterolemia; Oxysterol; Neurodegeneration; Oxidative stress; Mitochondrial dysfunction; Neuroinflammation

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# Recent Trends in Life Sciences

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Food for Huntington's Disease

16 April 2018, Pages 39-62

## Polyphenols and Huntington's disease

( Book Chapter)

Manivasagam, T., Justin Thenmozhi, A., Dhivya Bharathi, M., Sumathi, T., Saravanababu, C., Borah, A., Essa, M.M.

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### Abstract

Huntington's disease is the most common neurodegenerative disease, characterized by notable cognitive impairment and specific movement disorder. Currently used medications offer symptomatic relief to HD, without preventing the disease progression. Various pre-clinical experiments and clinical trials have shown that the multi-target ability of the traditional herbal medicine and its phytochemicals could offer therapeutic ailment for HD. Plant derived polyphenols are the ubiquitous compound with multiple pharmacological activities including antioxidant, anti-inflammatory, mitochondrial protective and anti-apoptotic activities. They can improve cognitive functions and prevent/delay the onset of certain neurodegenerative disease including HD. © 2018 Nova Science Publishers, Inc.

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- Preface
- Polyphenols and Huntington's disease
- The role of natural flavonoids in Huntington's disease
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Neurology and Diet: Molecular Perspective

# Food for Huntington's Disease



M. Mohamed Essa • T. Manivasagam  
A. Justin Theremochi • Qazi Hamid

Editors



## Neuroprotective Natural Products: Clinical Aspects and Mode of Action

### Chapter 5

# Neuroprotective Effect of Ayurvedic Preparations and Natural Products on Parkinson's Disease

Anupom Borah, Amarendranath Choudhury, Rajib Paul, Muhammed K. Mazumder, Swapnali Chetia

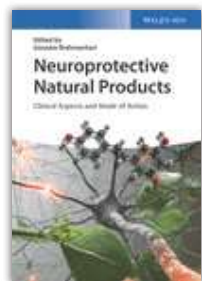
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## Summary

Parkinson's disease (PD) is an old-age neurodegenerative motor disorder characterized by resting tremor, rigidity, bradykinesia, and postural instability due to degeneration of midbrain dopaminergic neurons that results in decrease in the level of neurotransmitter dopamine (DA) in the striatum. In the eighteenth century, James Parkinson first described the disease as "shaking palsy," which was later named as PD. However, a description of equivalent parkinsonian symptoms is found in ancient Indian medical system of Ayurveda under the name *Kampavata*. As early as 300 BC, a coherent picture of parkinsonism was found in the Ayurvedic literature – *Charaka Samhita*, where head tremor (*Sirakampa*) and generalized tremor were described. Ayurvedic physicians used a cocktail of powdered seeds of *Atmagupta* (*Mucuna pruriens*) and *Paraseekayavane* (*Hyoscyamus reticulatus*) with roots of *Ashwagandha* (*Withania somnifera*) and *Bala* (*Sida cordifolia*) in cow's milk to treat *Kampavata*. Presently, use of a DA precursor, 3,4-dihydroxyphenylalanine (L-DOPA), is the choice of treatment to alleviate motor symptoms of PD. However, long-term L-DOPA treatment is associated with adverse side effects, such as motor fluctuations, dyskinesia, and drug-induced toxicity. A prospective clinical trial on the effectiveness of the Ayurvedic formulation in PD patients provided significant improvement of the symptoms, which has been attributed to the presence of L-DOPA and other neuroactive components in the formulations. Thus, the recent trend of therapeutic approaches in PD research has shifted to natural products or herbal formulations that would provide independent therapy or neuroprotective support to the existing drug, where Ayurveda will be of immense significance. In this chapter, we discuss the potentials of natural products used in Ayurvedic formulations as alternative/adjutant to the DA replenishment therapy for PD and highlighted their molecular mechanisms of action.



## Neuroprotective Natural Products: Clinical Aspects and Mode of Action

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### About this book

Focusing on the molecular mechanisms of powerful naturally occurring agents and their implication for drug discovery, this timely book presents an overview of the most recent research advances in the field of bioactive natural products and natural drug formulations to combat today's destructive diseases. To this extent, the authors discuss the most severe neurological disorders in our ... [Show all](#) ▾

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