

NEUROLOGY - LABORATORY
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HEALTH

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Editors

Natural Solutions for Neurodegenerative Disorders

Exploring Botanical
Remedies

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Chapter 5

Neuroprotective Effects of Green Tea Extracts

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Abstract

Deficits in cognition and movement are caused by neurodegeneration, which is a gradual deterioration in the composition and capabilities of nerve cells. Oxidative damage, inflammation, misfolded proteins, and heredity are among the contributing factors. Examples of diseases like these are Parkinson's and Alzheimer's. Potential neuroprotection against these processes is provided by green tea extracts. The *Camellia sinensis* plant yields green tea, which has drawn a lot of interest due to its abundance of bioactive substances, especially catechins. The chapter explores the expanding corpus of scientific literature, elucidating the several methods by which green tea extracts elicit their neuroprotective properties. The capacity of green tea extracts to counteract inflammation

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and oxidative stress—two important variables in neurodegenerative illnesses like Alzheimer’s and Parkinson’s—explains their neuroprotective qualities. These extracts show an amazing ability to scavenge free radicals, minimizing damage to neurons and improving mental performance. Furthermore, they moderate the expression of genes linked to neuroinflammation, reducing inflammatory reactions in the brain. This chapter also explores the function of green tea catechins in maintaining neuronal plasticity and stimulating the development of new neurons. These substances have promise in mitigating the consequences of age-related cognitive decline and neurological diseases by improving synaptic connection and promoting neurogenesis. A comprehensive review of several *in vitro* and *in vivo* investigations, clinical trials, and animal models highlights the strong evidence that green tea extracts have neuroprotective properties. With optimism for the management and prevention of neurodegenerative diseases, readers will obtain important insights into green tea’s potential as a readily available, natural neuroprotective agent.

Keywords: green tea extracts, neuroprotection, catechins, oxidative stress, inflammation, neurodegenerative diseases

Abbreviations

BDNF	Brain-derived neurotrophic factor
CNS	Central Nervous System
EC	Epicatechin
ECG	Epicatechin Gallate
EGC	Epigallocatechin
EGCG	Epigallocatechin gallate
ROS	Reactive Oxygen Species

Introduction

Green tea is made from *Camellia sinensis* leaves and has been used in Asian medicine for millennia. It is highly regarded for its many health benefits. Green tea is known for its polyphenols, or catechins, among which epigallocatechin gallate (EGCG) is the most powerful and well-studied for its anti-inflammatory and antioxidant properties (Khan & Mukhtar, 2013; Chacko et al., 2010). According to research, green tea extracts may improve