



## NEUROPROTECTIVE EFFECTS OF HESPERIDIN: IN-VITRO AND IN-SILICO EVALUATION OF ITS ANTIOXIDANT AND ENZYME INHIBITORY ACTIVITIES

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### Abstract

Brain disorders are persistent medical conditions characterized by a gradual deterioration in neurological functioning. There is a worldwide increase in interest in phytochemicals for their beneficial health benefits and low adverse effects. Hesperidin (Hsp), a flavanone glycoside in citrus fruit peels, has many pharmacological characteristics. Nevertheless, there is a need for more comprehensive investigations that elucidate the underlying mechanism of action. The objective of this work is to assess the neuroprotective impact of Hsp using in-vitro tests for the inhibition of acetylcholinesterase (AChE), monoamine oxidase (MAO), and 1,1-diphenyl-2-picrylhydrazyl (DPPH) (H<sub>2</sub>O<sub>2</sub>), followed by in-silico techniques such as molecular docking and molecular dynamics. The outcomes of the current investigation demonstrate significant inhibitory effects on AChE, MAO, DPPH, and H<sub>2</sub>O<sub>2</sub>, which may be attributed to the intended pharmacological actions of Hsp. In-silico studies showed strong interactions of Hsp with targeted proteins. Thus, Hsp has the potential to be formulated as a neuroprotective medication.

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