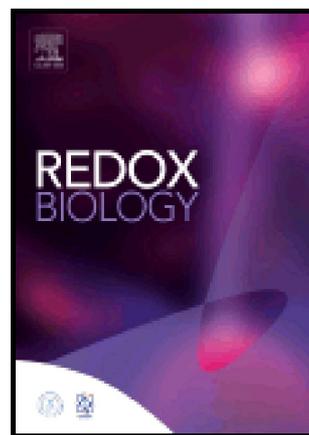


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Neuroprotection through Flavonoid: Enhancement of the Glyoxalase Pathway

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Abstract

The glyoxalase pathway functions to detoxify reactive dicarbonyl compounds, most importantly methylglyoxal. The glyoxalase pathway is an antioxidant defense mechanism that is essential for neuroprotection. Excessive concentrations of methylglyoxal have deleterious effects on cells, leading to increased levels of inflammation and oxidative stress. Neurodegenerative diseases – including Alzheimer's, Parkinson's, Aging and Autism Spectrum Disorder – are often induced or exacerbated by accumulation of methylglyoxal. Antioxidant compounds possess several distinct mechanisms that enhance the glyoxalase pathway and function as neuroprotectants. Flavonoids are well-researched secondary plant metabolites that appear to be effective in reducing levels of oxidative stress and inflammation in neural cells. Novel flavonoids could be designed, synthesized and tested to protect neurodegenerative diseases through regulating glyoxalase pathway.

Graphical Abstract

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