

Effects of curcumin on neurological diseases: focus on astrocytes

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Astrocytes are the most abundant glial cells in the central nervous system, and are important players in both brain injury and neurodegenerative disease. Curcumin (1,7-bis[4-hydroxy-3-methoxyphenyl]-1,6-heptadiene-3,5-dione), the major active component of turmeric, belongs to the curcuminoid family that was originally isolated from the plant *Curcuma longa*. Several studies suggest that curcumin may have a beneficial impact on the brain pathology and aging. These effects are due to curcumin's antioxidant, free-radical scavenging, and anti-inflammatory activity. In light of this, our current review aims to discuss the role of astrocytes as essential players in neurodegenerative diseases and suggest that curcumin is capable of direct inhibition of astrocyte activity with a particular focus on its effects in Alexander disease, Alzheimer's disease, ischemia stroke, spinal cord injury, Multiple sclerosis, and Parkinson's disease. © 2020, Maj Institute of Pharmacology Polish Academy of Sciences.

Brain

Curcuminoids

Neurodegenerative disease

curcumin

Alzheimer disease

antiinflammatory activity

antioxidant activity

astrocyte

brain edema

brain ischemia

cell activation

degenerative disease

depression

drug bioavailability

drug mechanism

epilepsy

glioma

human

microglia

multiple sclerosis

nervous system inflammation

neurologic disease

neuropathic pain

nonhuman

oxidative stress

Parkinson disease

Persian Gulf syndrome

Review

spinal cord injury