Inflammatory mechanisms and oxidative stress as key factors responsible for progression of neurodegeneration: Role of brain innate immune system

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Chronic inflammation is characterized by longstanding microglial activation followed by sustained release of inflammatory mediators, which aid in enhanced nitrosative and oxidative stress. The sustained release of inflammatory mediators propels the inflammatory cycle by increased microglial activation, promoting their proliferation and thus stimulating enhanced release of inflammatory factors. Elevated levels of several cytokines and chronic neuroinflammation have been associated with many neurodegenerative disorders of central nervous system like age-related macular degeneration, Alzheimer disease, multiple sclerosis, Parkinson?s disease, Huntington? disease, and tauopathies. This review highlights the basic mechanisms of neuroinflammation, the characteristics of neurodegenerative diseases, and the main immunologic responses in CNS neurodegenerative disorders. A comprehensive outline for the crucial role of microglia in neuroinflammation and neurodegeneration and the role of Toll-like receptor signalling in coexistence of inflammatory mechanisms and oxidative stress as major factors responsible for progression of neurodegeneration have also been presented. © 2016 Bentham Science Publishers.

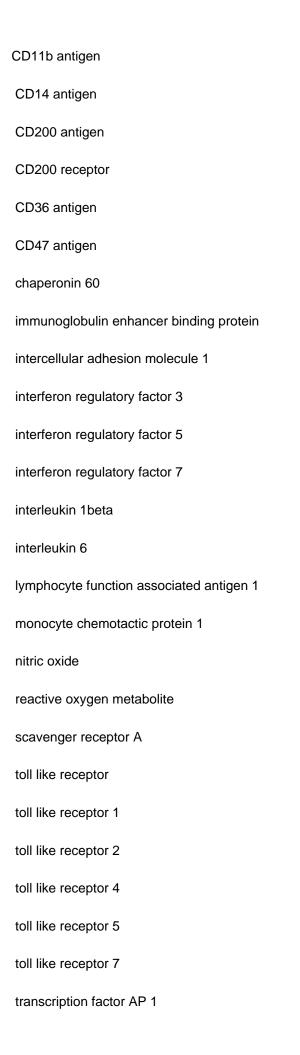
Microglia

Neurodegenerative disorders

Neuroinflammation

Oxidative stress

Toll-like receptors



tumor necrosis factor
unindexed drug
vascular cell adhesion molecule 1
very late activation antigen 6
cytokine
Alzheimer disease
Article
blood brain barrier
cell survival
central nervous system
disease course
DNA polymorphism
gene mutation
human
innate immunity
microglia
nerve degeneration
nervous system inflammation
nonhuman
oxidative stress
protein expression
signal transduction
animal
brain
degenerative disease
disease course

immunology
inflammation
innate immunity
metabolism
oxidative stress
pathology
pathophysiology
physiology
Animals
Brain
Cytokines
Disease Progression
Humans
Immunity, Innate
Inflammation
Microglia
Neurodegenerative Diseases
Oxidative Stress