Neuroprotective effects of the catalytic subunit of telomerase: A potential therapeutic target in the central nervous system

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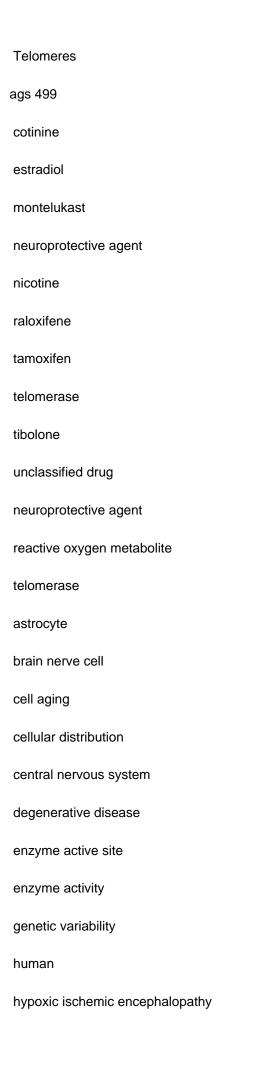
Senescence plays an important role in neurodegenerative diseases and involves key molecular changes induced by several mechanisms such as oxidative stress, telomere shortening and DNA damage. Potential therapeutic strategies directed to counteract these molecular changes are of great interest for the prevention of the neurodegenerative process. Telomerase is a ribonucleoprotein composed of a catalytic subunit (TERT) and a RNA subunit (TERC). It is known that the telomerase is involved in the maintenance of telomere length and is a highly expressed protein in embryonic stages and decreases in adult cells. In the last decade, a growing number of studies have shown that TERT has neuroprotective effects in cellular and animal models after a brain injury. Significantly, differences in TERT expression between controls and patients with major depressive disorder have been observed. More recently, TERT has been associated with the decrease in reactive oxygen species and DNA protection in mitochondria of neurons. In this review, we highlight the role of TERT in some neurodegenerative disorders and discuss some studies focusing on this protein as a potential target for neuroprotective therapies. © 2016 Elsevier B.V.

Neuroprotection

Oxidative stress

Senescence

Telomerase



microglia
mitochondrial targeting signal
neuroprotection
nonhuman
oxidative stress
pleiotropy
protein expression
protein localization
protein phosphorylation
protein targeting
Review
senescence
telomere
telomere homeostasis
telomere shortening
aging
animal
central nervous system
DNA damage
drug effects
genetics
metabolism
Neurodegenerative Diseases
physiology
Aging
Animals

Central Nervous System	
DNA Damage	
Humans	
Neurodegenerative Diseases	
Neuroprotective Agents	
Oxidative Stress	
Reactive Oxygen Species	
Telomerase	
Telomere	
Telomere Shortening	