Co-Administration Therapy to Prevent Neurodegeneration and Enhance Neuroprotection

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OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Disease: Central Nervous System
  - New Chemical Entities, Drug Leads
  - Therapeutics

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BRIEF DESCRIPTION

Neurodegenerative diseases are a broad category of illnesses expected to affect 1 in 4 Americans. As they have a variety of underlying mechanisms and pathologies, there are currently no effective methods to prevent or modify disease progression. UCI researchers have developed a potential treatment utilizing a novel combination of two compounds for the abatement of brain inflammation and degeneration.

SUGGESTED USES

·Intended for use in the treatment of neurodegenerative diseases, including Parkinson's Disease (PD), Alzheimer's Disease (AD), Huntington's Disease (HD) and Amyotrophic lateral sclerosis (ALS).

·Treatment of non-neurodegenerative disease associated inflammation

FEATURES/BENEFITS

·Broad Applicability: can be used to treat multiple neurodegenerative diseases

·BBB Permeability: these compounds can cross the blood-brain barrier necessary for neurodegenerative disease

·Repurposed: one of the compounds is already FDA-approved for a non-CNS condition; extensive safety record

·Multi-faceted: addresses several pathological components of neurodegenerative disease Synergistic: at the correct relative ratios, these compounds enhance therapeutic effects

FULL DESCRIPTION

Neurodegenerative diseases, while affecting different regions of the central nervous system (CNS) and inducing accumulation of disparate pathologies, have common characteristics with deleterious effects on neural cells. Inflammation, altered metabolism and energy production, and the loss of CNS health-promoting growth factors are all features of AD, PD, HD, and ALS. Currently, no disease-modifying treatments are available to target brain pathologies and help long-suffering patients with these progressive disorders. Researchers at the University of California Irvine have developed a novel approach to address shared features of neurodegeneration, consisting of two compounds with the ability to reduce inflammation and mitochondrial stress in neural cells, thereby promoting cell health and resilience to cellular damage. Importantly, these compounds are BBB-permeable and elevate levels of protein PGC-1α; low levels of PGC-1α are associated with neurodegenerative disease. Due to the compounds' influence on multiple cellular signaling pathways that are disrupted in several CNS disorders, this approach is a promising potential treatment for the millions of people suffering with neurodegenerative disease.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20220401404	12/22/2022	2018-504

STATE OF DEVELOPMENT

·In vitro: The proposed treatment promotes cell viability in neuronal cells (MN9D), prevents microglial (CNS-resident immune cells) activation (BV2 cells), and prevents inflammation in primary mouse-derived astrocytes & microglia. Therapeutically synergistic compound ratios have been determined in pooled human liver microsomes (HLM).

·In vivo: The compounds have been tested in a mouse model of Parkinson's Disease (MPTP) and halt neuronal cell loss , decrease microglial activation, and promote the release of brain-beneficial factors. Co-administration has been shown to increase PGC-1α levels above single administration in mouse brains.

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