Researchers identify new compound that protects against neurodegeneration

July 18, 2018

Researchers from the University of Liverpool have identified a new compound that protects against neurodegeneration in nematode worms. The discovery may enable novel treatments for human neurodegenerative diseases to be developed in the future.

With the predicted growth of the global aging population, cases of age-associated neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease and amyotrophic lateral sclerosis (ALS) are expected to rise. However, most current therapies do not decelerate or modify disease, and efforts to develop new treatments have been met with high attrition rates.

The antiepileptic drug ethosuximide has recently been shown to protect against neurodegeneration in various nematode worm and rodent models. It is therefore a promising repurposing candidate for the treatment of multiple neurodegenerative diseases. However, high concentrations of the drug are required for its protective effects in animal models, which may limit its translational potential and impede the identification of its molecular mechanism of action.

100 times more potent

Researchers, led by Professor Alan Morgan from the University's Institute of Translational Medicine, aimed to develop a more potent version of the drug to avoid these impediments.

In a collaborative approach involving University of Liverpool experts in Chemistry, (Professor Paul O'Neill, Dr Neil Berry), Nuclear magnetic resonance (Dr Marie Phelan) and nematode worms (Dr Shi Quan Wong, Professor Bob Burgoyne, Dr Jeff Barclay) the team identified a novel neuroprotective molecule called MPS that is chemically similar to ethosuximide, but is much more potent in reducing neurodegeneration in a worm model of ALS.

Professor Morgan, said: "Our research has revealed a novel neuroprotective activity of MPS that is over 100 times more potent than ethosuximide. This discovery may have translational potential for the treatment of ALS and potentially other neurodegenerative diseases."

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