A new research paper was published on the cover of *Aging*, title "Stress granules sequester Alzheimer's disease-associated gene transcripts and regulate disease-related neuronal proteostasis."
Environmental and physiological stresses can accelerate Alzheimer's disease (AD) pathogenesis. Under stress, a cytoplasmic membraneless structure termed a stress granule (SG) is formed and is associated with various neurodegenerative disorders, including AD. SGs contain translationally arrested mRNAs, suggesting that impaired RNA metabolism in neurons causes AD progression; however, the underlying mechanism remains unclear.

In this new study, researchers Kaoru Sato, Ken-ichi Takayama and Satoshi Inoue from Tokyo Metropolitan Institute for Geriatrics and Gerontology identified numerous mRNAs and long non-coding RNAs that are directly targeted by the SG core proteins G3BP1 and G3BP2.

"In this study, we conducted a genome-wide investigation of the G3BP1- and G3BP2-bound RNAs using enhanced cross-linking and immunoprecipitation-sequencing (eCLIP-seq) in the human neuroblastoma (NB) cell line SH-SY5Y," say the authors.

G3BP1 and G3BP2 redundantly target RNAs before and after stress conditions. The researchers further identified RNAs within SGs, wherein AD-associated gene transcripts accumulated, suggesting that SGs can directly regulate AD development. Furthermore, gene-network analysis revealed a possible link between the sequestration of RNAs by SGs and the impairment of protein neurohomeostasis in AD brains.

"Together, our study provides a comprehensive RNA regulatory mechanism involving SGs, which could be targeted therapeutically to slow AD progression mediated by SGs," conclude the researchers.

Provided by Impact Journals LLC


This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.