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JNCASR suggests ways to develop therapeutic strategies for Alzheimer's, Parkinson's and cancer

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Defects in autophagy are associated with many neurodegenerative diseases and cancers



Researchers from Bengaluru-based Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute under the Department of Science and Technology (DST), have discovered a surprising role in the autophagy, or "autotrophic" process, which separates damaged parts, fights infections and enables long-term cells like neurons to function smoothly.

Identification of key components in the early stages of autophagosome biogenesis, which is an important stage of the autophagy process, can establish the basis for modifying this process to detect interventions to restore this process in diseases such as Alzheimer's, Parkinson's, and cancer.

Researchers have found that a group of proteins called exocyst complexes, which normally help bring important molecules to the surface of the cell, play an important role in autophagy. This complex consists of a team of 8 proteins; Interestingly, 7 of these 8 proteins assist the cell in developing a garbage bag so that it can completely wrap the waste. When this complex is absent, the cell sac-forming structure stops functioning properly and even begins to form a defective, non-functional structure.

The researchers used normal yeast cells to elucidate the formation of autophagosomes (cellular waste bags), helping to understand how this important process occurs in higher organisms.

They elucidated the process by which a protein complex exocyst, previously recognised for its role in secretion, also contributes to the autophagy pathway, which is important for maintaining cellular health. Defects in autophagy are associated with many neurodegenerative diseases and cancers.