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Protein interaction study can help treatments for Alzheimer's & Parkinson's

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Focusing on the interaction between proteins and osmolytes



Small molecules called osmolytes help proteins maintain their structure and function under stressful conditions, according to a recent study, which provides important insights that could aid in the development of treatments for diseases like Alzheimer's and Parkinson's.

A research team led by Dr Shubhasis Haldar at Kolkata's S.N. Bose National Centre for Basic Sciences, an autonomous institute of Department of Science and Technology, used a technique called covalent magnetic tweezers to observe how individual protein molecules fold and unfold under different conditions and interact with osmolytes.

They focused on a protein called Protein L and tested its interaction with two osmolytes, Trimethylamine N-oxide (TMAO) and trehalose. At higher concentrations, TMAO significantly increased the strength of Protein L, making it more resistant to unfolding. At low concentrations (up to 1M), TMAO had little effect on the unfolding force of the protein.

High levels of TMAO are linked to heart diseases, so knowing how it interacts with proteins can lead to better treatments.

Osmolytes are small molecules that help cells survive stress by stabilising proteins and preventing them from misfolding. Misfolded proteins can’t perform their functions properly, leading to diseases. Osmolytes are crucial in maintaining the stability of protein structures, making them potential targets for new drugs.