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Single-molecule techniques reveal new dynamics of protein folding associated with Alzheimerâ??s disease progression

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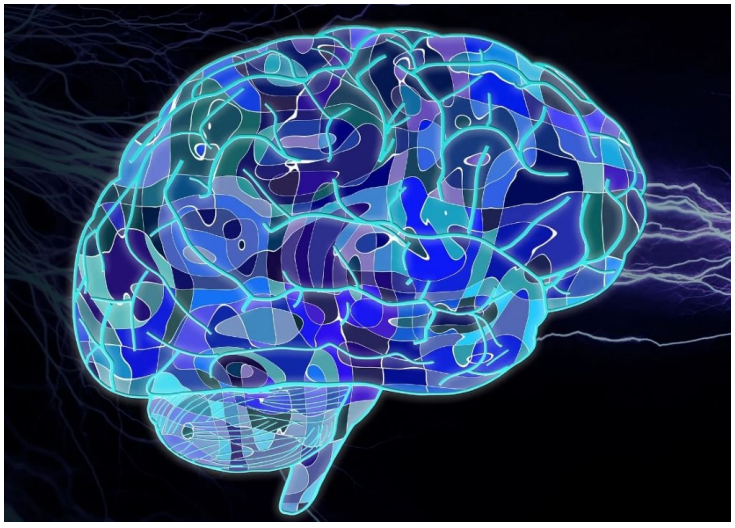
Providing insights into the intricate dynamics of chaperone-assisted protein folding



A new way to study protein folding & associated chaperons that saves proteins from non-native interaction, could help understand what exactly triggers the folding. The understanding could help track progression of diseases like cancer, Parkinsons and Alzheimer’s.

A team at the S.N. Bose National Centre for Basic Sciences, Kolkata, is using a Covalent Magnetic Tweezer (CMT) fabricated in their lab, to study physical and chemical properties of protein molecules and action of chaperones on how these molecules fold and function.

This innovative approach has provided unprecedented insights into the intricate dynamics of chaperone-assisted protein folding. Among the key players in this molecular ballet are the heat shock proteins Hsp70 and Hsp90, two of the most studied molecular chaperones.

Single-molecule force spectroscopy has revealed the intricate dynamics of Hsp70-induced protein manipulation. The intricate details are crucial for understanding how Hsp70 assists in protein folding, stabilization, and transport under various cellular conditions.

The researchers are now beginning to understand the exact mechanism of how Alzheimer's sets in due to brain stiffness. When the physical basis of degenerative diseases like Alzheimer’s and Parkinson’s Disease are understood at a molecular level, drugs can be designed to target the mechanical roles of the chaperones. That will make it easier to prevent the progression of these diseases.