

IISc explores translation of fluorogenic probe into diagnostic kit for Alzheimer's

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Fluorogenic probes are not fluorescent by themselves, but upon reaction with a target enzyme, they become fluorescent

Alzheimer's disease, a neurodegenerative disorder, results in memory loss and compromises cognitive abilities in many people beyond the age of 60. Currently used techniques to detect manifestations of the disease (MRI, PET, and CT scans) are complex, expensive, and often produce inconclusive results.

In a study published by researchers at the Indian Institute of Science (IISc), Bengaluru, a small molecular fluorogenic probe can sense a specific enzyme linked to the progression of Alzheimer's disease. Such a probe can easily be fabricated into a strip-based kit that may enable on-site diagnosis.

Studies have shown that in the early stages of Alzheimer's disease, Acetylcholinesterase (AChE) levels become imbalanced, thus making it a potential biomarker for the disease.

The team showed that the fluorogenic probe could also enter brain cells cultured in the lab and fluoresce upon contact with AChE.

Currently, the probe is UV-active, which can be harmful to tissues in high doses. Certain modifications would lead to the development of near-infrared active probes, which would be safer for living cells and allow deep-tissue imaging.

Apart from Alzheimer's disease, such a probe can also be used for other applications like detecting pesticide-related poisoning, as AChE can be inhibited by compounds used in some pesticides.