

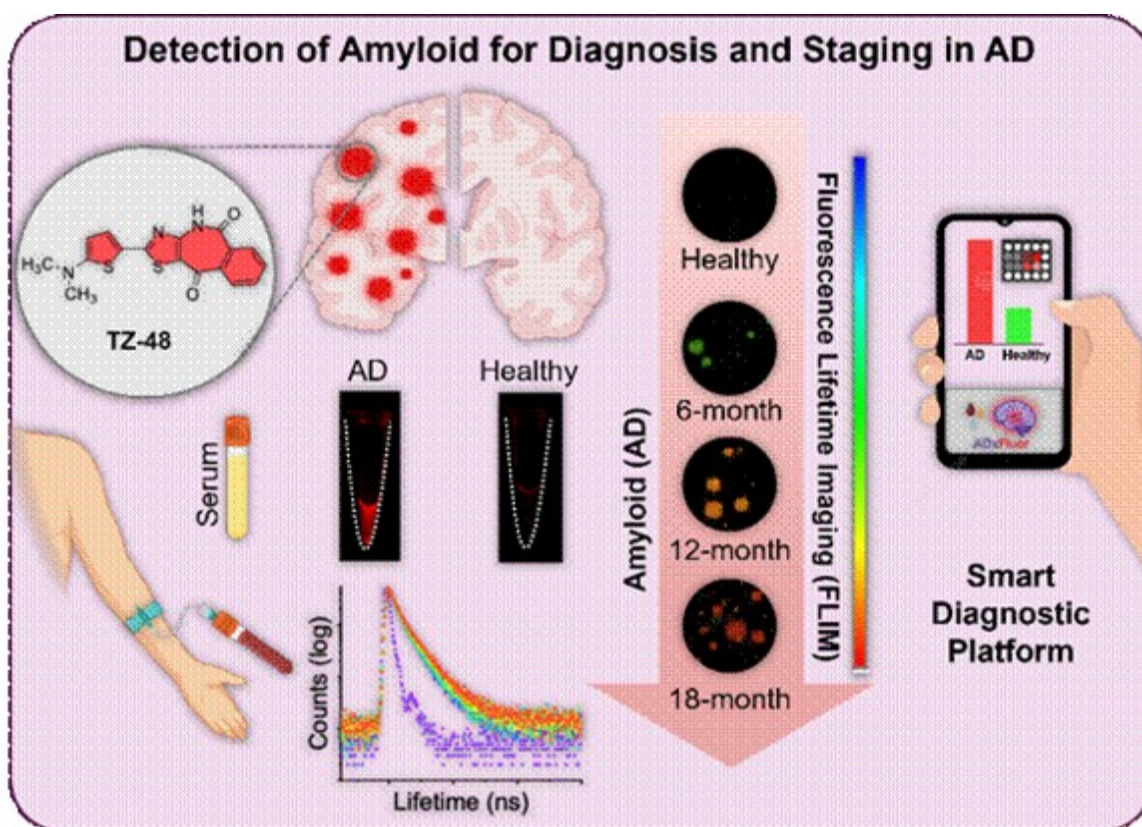
Smartphone-Enabled Alzheimer's Diagnostic Platform

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Why in News?

Scientists at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) have developed a molecular probe for early-stage detection of Alzheimer's Disease (AD).

- **Molecule Probe (TZ-48)** - A smart, tiny fluorescence lifetime-responsive probe that selectively binds to misfolded **Amyloid- β (A β) fibrils**.
- It produces a "turn-on" fluorescence response and distinct lifetime signatures.
- **ADxFluor** - Uses a dedicated smartphone application to capture and quantify changes in fluorescence intensity, enabling rapid, objective, and point-of-care biofluid testing.
- **Features** -
 - Exhibited high Blood-Brain Barrier (BBB) permeability and robust labeling of A β plaques in animal models, demonstrating utility in both brain tissue imaging and biofluid detection (blood serum and cerebrospinal fluid).
 - Provides a low-cost alternative to conventional, high-cost diagnostic tools such as
 - Positron Emission Tomography (PET),
 - Magnetic Resonance Imaging (MRI), and
 - Complex laboratory-bound immunoassays.



Alzheimer's Disease & Biomarker Amyloid- β (A β)

- **Alzheimer's Disease** - It is a progressive neurodegenerative disorder marked by memory loss, cognitive decline, and behavioral changes.
- **Role of Amyloid- β (A β)**- Caused by the misfolding and aggregation of A β peptides into extracellular amyloid plaques, which trigger neurotoxic cascades, synaptic dysfunction, and neuronal cell death.
- **Diagnostic Significance**- A β pathology is recognized as an early and highly specific hallmark biomarker, essential for timely intervention before irreversible cognitive damage occurs.

Reference

[PIB | New smart technology can make diagnosis of AD more accessible](#)

