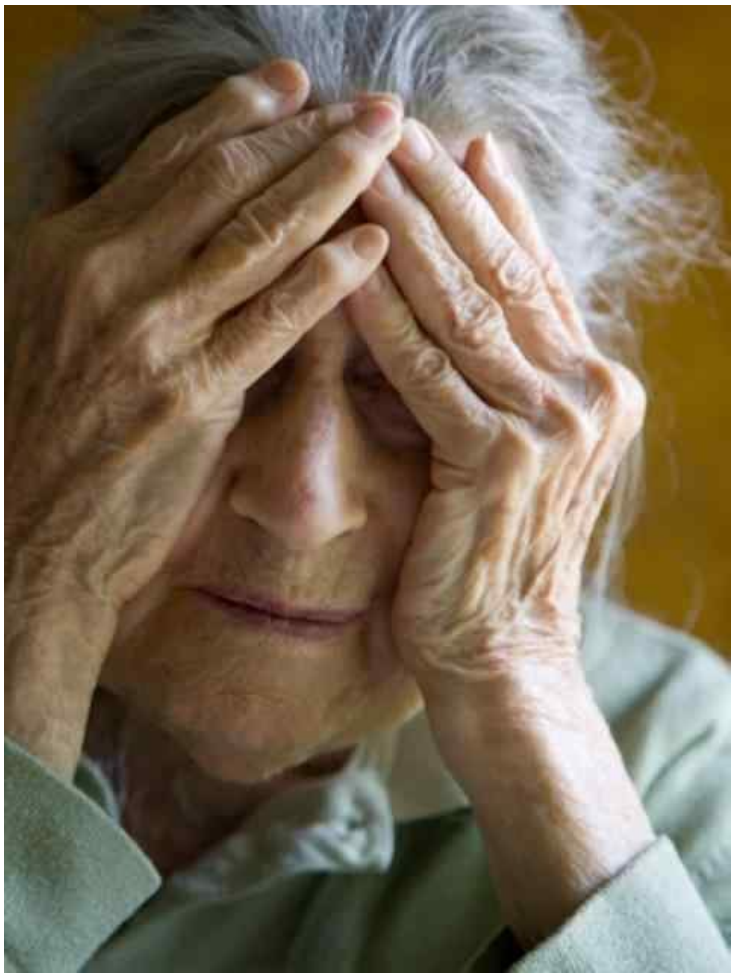
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ASIA EDITION

Cold Spring Harbor Lab uses cancer drugs to treat Alzheimer's

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Singapore: A team of American and Chinese neuroscientists at the Cold Spring Harbor Laboratory (CSHL) have carried out research to show that a class of currently used anti-cancer drugs as well as several previously untested synthetic compounds can be used to reverse memory loss in two animal models of Alzheimer's disease by targeting the epidermal growth factor receptor (EGFR).

Dr Yi Zhong, professor, CSHL, who led the research conducted in fruit flies and mice, said that the team used two independent experimental approaches "the results of which clearly converged." The research converged on what Dr Zhong's team suggests is a "preferred target" for treating memory loss associated with the amyloid-beta (AÃ?Â½Ã?Â²) plaques seen in advanced Alzheimer's patients.

Over expression of the EGFR is a characteristic feature of certain cancers, notably a subset of lung cancers. Two targeted treatments, erlotinib (Tarceva) and gefitinib (Iressa), can dramatically, albeit transiently, reverse EGFR-positive cancers, by blocking the EGFR receptor and thus preventing its activation.

Dr Zhong's team demonstrated that enhanced activation of EGFRs in brain cells exacerbated memory loss in the AÃ?Å½Ã?Â²-42 fruit fly model of Alzheimer's disease. This led them to dose three-day-old flies of the same type with the two anti-cancer EGFR inhibitors over a week's time, which was shown in behavioral tests on day 11 to prevent memory loss. The results were then confirmed in mouse models of Alzheimer's, also based on the human AÃ?Å½Ã?Â²-42 gene.

Dr Zhong feels that the result was remarkable, more so because of a parallel but independent experimental process that also suggested EGFR as a drug target for Alzheimer's. This parallel process consisted of screening, by Dr Zhong's collaborators in China, of some 2,000 synthetic compounds for activity against AÃ?Å½Ã?Â²-induced memory loss in model fruit flies. Of these, 45 compounds showed positive results in fruit flies after two months of dosing. Nine of these were selected for testing in mouse models, of which four showed positive results after two months.