Alzheimer's researchers study drug efficacy in early stages of disease

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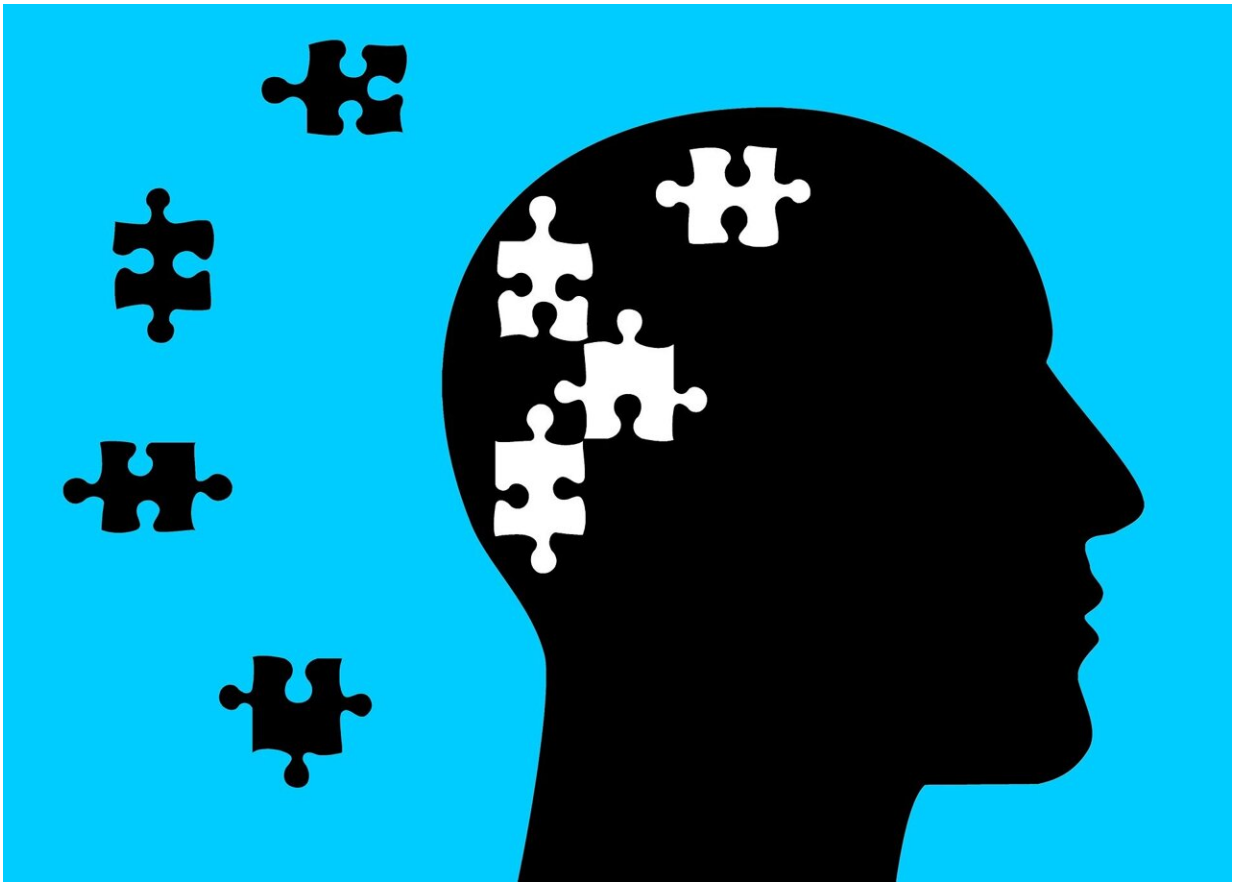

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Most drugs developed to treat Alzheimer's disease have for years been ineffective in clinical trials. Researchers from Indiana University School

of Medicine recently evaluated the efficacy of a failed clinical trial drug using their rigorous pipeline.

Researchers from Model Organism Development and Evaluation for Late-Onset Alzheimer's Disease (MODEL-AD), a consortium of experts at IU School of Medicine, The Jackson Laboratory, Sage Bionetworks, The University of Pittsburgh School of Medicine and University of California, Irvine, recently published their study in *Alzheimer's & Dementia: Translational Research & Clinical Intervention*, a journal of the Alzheimer's Association.

Adrian Oblak, Ph.D., assistant professor of radiology and imaging sciences at IU School of Medicine and first author on the publication, said the study investigated the efficacy of the drug verubecestat—a beta-secretase (BACE) inhibitor—administered in the early stages of Alzheimer's disease, using the MODEL-AD Preclinical Testing Core Drug Screening Pipeline.

"Although BACE inhibitors lowered amyloid beta plaque in patients with late-stage Alzheimer's disease during clinical trials, many of those studies stopped due to adverse events or lack of clinical efficacy," Oblak said. "The drug was also under-investigated in its effectiveness prior to the onset of Alzheimer's disease, making it an ideal compound for MODEL-AD to study."

The researchers conducted in vivo PET/MRI imaging to measure amyloid deposition and glucose uptake in the brain of the animal models, measured plasma and brain amyloid beta and assessed the clinical and behavioral characteristics.

Stacey Rizzo, Ph.D., associate professor of neurobiology and geriatric medicine at the University of Pittsburgh Aging Institute and senior author on the paper, said this study validates the importance of the

consortium in advancing Alzheimer's disease research.

"The MODEL-AD consortium brings together experts from the fields of Alzheimer's disease biology, mouse models, genetics, behavioral research, neuropharmacology and medical imaging to develop the research infrastructure that will benefit the entire Alzheimer's research community," Rizzo said. "There is currently no cure for Alzheimer's disease and so there is an absolute need to find a treatment and develop prevention strategies."

The National Institute on Aging, part of the National Institutes of Health, funded the MODEL-AD consortium to establish robust infrastructure for the greater research community to improve preclinical to clinical translational studies and accelerate the pace of bringing effective and safe treatments to patients at risk for Alzheimer's disease, Rizzo said.

"Under our rigorous unbiased screening strategy, we were able to prevent significant amyloid beta deposition, which was expected; however, the same dose range that was efficacious in preventing amyloid beta plaque formation resulted in similar side effects reported in the clinic and in the absence of cognitive improvement," Oblak said about the study. "Therefore, we would not have prioritized this compound for advancement into clinical trials had we vetted the compound using this rigorous unbiased approach."

The results from this investigation, Oblak said, like all animal models, protocols and validation data studied by MODEL-AD, are rapidly made available to all researchers for preclinical drug development, thanks to support of the NIA. Researchers can visit stopadportal.synapse.org to submit compounds for consideration through this pipeline.

More information: Adrian L. Oblak et al, Prophylactic evaluation of verubecestat on disease- and symptom-modifying effects in 5XFAD

mice, *Alzheimer's & Dementia: Translational Research & Clinical Interventions* (2022). DOI: 10.1002/trc2.12317