

New Research Projects

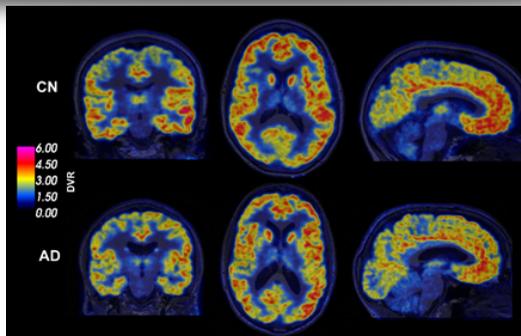


Figure caption: Novel techniques that use small molecule tracers and positron emission tomography (PET) imaging can be used to measure biochemical changes due to Alzheimer's disease. These insights can lead to early disease detection and development of new treatments. CN = cognitively normal, AD = Alzheimer's disease, DVR = distribution volume ratio.

Adam Mecca, M.D., Ph.D. is an Assistant Professor of Psychiatry and the Associate Director of the Yale Alzheimer's Disease Research Unit. To expand the basic understanding of Alzheimer's disease pathophysiology, Dr. Mecca's research aims to utilize two novel radioligands and Positron Emission Tomography imaging to characterize synaptic and receptor level changes that occur at presymptomatic¹ and symptomatic disease stages. Thus far, Dr. Mecca and his collaborators have used a novel PET imaging technique to measure decreases in synaptic density in people with Alzheimer's disease.² They have also shown age and Alzheimer's disease related declines in a specific synaptic receptor that is important for memory formation.³ A clearer understanding of synapse and receptor level changes will provide valuable insights into the Alzheimer's disease process that will hopefully lead to the development of both novel treatments and therapeutic biomarkers.

1. Mecca, A. P. *et al.* Initial Experience with PET Imaging of Synaptic Density (SV2A) in Alzheimer's Disease: A New Biomarker for Clinical Trials? *The American Journal of Geriatric Psychiatry* **26**, S145-S146, doi:10.1016/j.jagp.2018.01.176 (2018).
2. Chen, M. K. *et al.* Assessing Synaptic Density in Alzheimer Disease With Synaptic Vesicle Glycoprotein 2A Positron Emission Tomographic Imaging. *JAMA Neurol*, doi:10.1001/jamaneurol.2018.1836 (2018).
3. Mecca, A. P. *et al.* Investigating Age Related Associations of Metabotropic Glutamate Receptor 5 Density Using [¹⁸F]FPEB and PET. *The American Journal of Geriatric Psychiatry* **25**, S96-S97, doi:10.1016/j.jagp.2017.01.110 (2017).

PBR28 brain PET imaging with lipopolysaccharide challenge for the study of microglia function in Alzheimer's disease

Dr. Arash Salardini, MD Assistant Professor Behavioral Neurology

The presence of inflammation in the brains of patients with Alzheimer's disease (AD) has long been noted by neuropathologists. However, it is not clear whether this inflammation is an innocent bystander or plays a major role in the development and/or progression of Alzheimer's disease. Microglia, inflammatory cells that reside in the brain, are in an activated state in brains affected by AD. A new Positron Emission Tomography (PET) technique using a labeled microglia protein that is taken up by the brain in response to inflammatory challenges such as lipopolysaccharide (LPS) will be used to determine whether there are differences in the level of inflammation when comparing patients with Alzheimer's disease to control participants of similar ages. This may eventually lead to new diagnostic tests and suggest possible therapies.

WALK to End Alzheimer's

It is walk season again in Connecticut and around the nation as the Alzheimer's Association holds its annual **Walk to End Alzheimer's**. This event is not only the premier fund raising event for the Association, but is intended to raise awareness of Alzheimer's disease in the general population. Funds from the Walk support the mission of the Alzheimer's Association "to eliminate Alzheimer's disease through the advancement of research; to provide and enhance care and support for all affected; and to reduce the risk of dementia through the promotion of brain health." The programs and services of the Connecticut Chapter in the care and support of individuals and families include a 24/7 Helpline, care consultations, family support groups, groups for individuals with early stage dementia, Safe Return wanderer's bracelet, grants for respite care, and Trialmatch to link individuals with research opportunities. The Chapter provides community education through literature and programming, and education for professional caregivers including an Annual Dementia Education Conference in the spring. The National Alzheimer's Association is the leading non-governmental sponsor of research to find a cure for Alzheimer's and funds are passed on from the Chapter to National for this purpose. The Chapter hopes to raise \$1.7-million through its 7 walks this fall. The Walk schedule is:

September 9 Enfield Town Green, Enfield

September 15 Ocean Beach Park, New London

September 16 Calf Pasture Beach, Norwalk

September 23 White Memorial Conservation Park, Litchfield

September 30 Lighthouse Point Park, New Haven

September 30 Western CT State University Westside Campus, Danbury

October 14 Pratt & Whitney Stadium at Rentschler Field, East Hartford.

So put on your sneakers, choose a walk close to you, register, raise money, and walk. You can participate as a walker, volunteer, or raise money as a "virtual walker" if you are unable to attend the event. Yale ADRC will have tables at the Walks in Norwalk, New Haven, and East Hartford so stop by and chat with us. Click on the link below for more information or to register: <https://www.alz.org/ct>

Thank your customer, tell them how valuable they are to you, but don't go overboard.
Insincerity is easy to spot.

Sincerely,

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Alzheimers Disease Research Center

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