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Beta-Amyloid Plaque Imaging Agents

Tech ID: 25221 / UC Case 2012-664-2

BRIEF DESCRIPTION

Current imaging agents for labelling β-amyloid plaques and neurofibrillary tangles (NFT), which are indicators for Alzheimer's disease, suffer from drawbacks such as (but not limited to) non-specific binding, low target to non-target ratio, instability, and inefficient labelling.

Researchers at UC Irvine have developed an imaging agent and its derivatives for labelling β-amyloid plaques and NFTs that overcome these problems and also provide therapeutic properties in vivo for the neural tissues. The labelling agent also binds to norepinephrine transporters (NET) and are taken up into the cells via the NET, therefore serving as suitable agents for diagnostic and/or therapeutic purposes involving disorders or conditions associated with NET.

FULL DESCRIPTION

Alzheimer's disease is a neurogenerative condition that is characterized by the accumulation of β-amyloid plaques and neurofibrillary tangles (NFTs) in the brain. In efforts to find treatments and a cure for Alzheimer's disease, it is of interest to correlate amyloid plaque and NFT presence with features/symptoms. Therefore, labelling agents are used to track the amyloid plaques and NFTs. However, problems with existing labelling compounds (include non-specific binding, inability to cross the blood brain barrier, instability under physiological conditions, and inefficient labelling) motivate the development of new and more effective labelling compounds.

Researchers at UC Irvine have developed a novel compound for labelling amyloid plaque and NFT imaging for improved labelling for diagnostic and in vivo therapeutic applications. This compound has a base structure of a substituted amine-(hetero)aryl-linker-(hetero)aryl-substituted amine as shown in Figure 1.
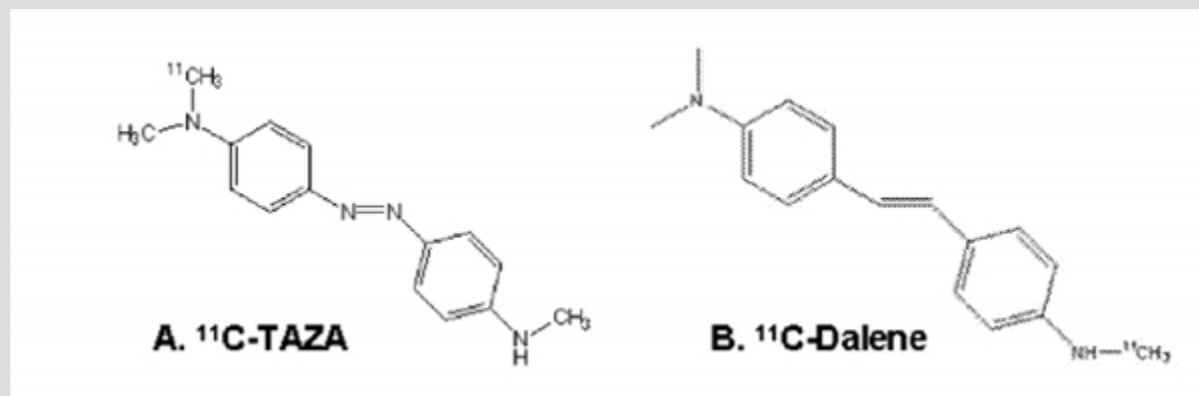

Figure 1. Compounds

The compounds can be easily modified for different labels, for example, the compound can be modified to contain PET-detectable label (11C or 18F) for PET diagnostic imaging.

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OTHER INFORMATION

CATEGORIZED AS

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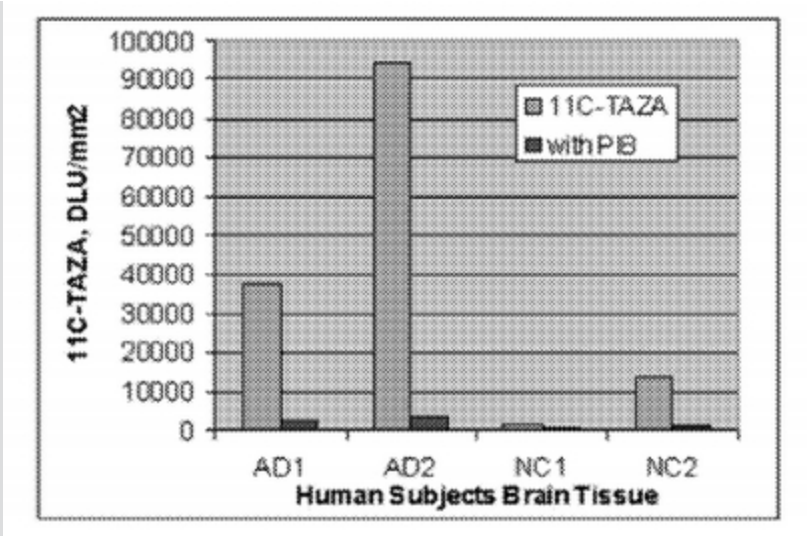
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Figure 2. A graph comparing the test results of 11C-TAZA (invented compound) and 11C-PIB (control) in normal (NC1 and NC2) and Alzheimer's disease (AD1 and AD2) neural tissue. More binding is observed using the invented compound.

Researchers at UC Irvine have also demonstrated that the compounds bind specifically to norepinephrine transporters (NET) and can be taken up into the cells via the NET. This specificity can be leveraged for diagnostic/therapeutic applications involving NET disorders or medical conditions.

SUGGESTED USES

The compounds and compositions are useful for imaging and/or diagnostic use of conditions associated with presence of β-amyloid plaques and NFTs.

The compounds and its compositions are also useful for diagnostic/therapeutic applications for disorders or medical conditions associated with NET due to the agents' specificity for and/or uptake by NET.Suitable uses for the compound include treatment of various attention deficit disorders, and/or treatment of depression, schizophrenia, and other mood disorders.

ADVANTAGES

The imaging agents developed here have improved solubility and improved specificity for (1) amyloid plaques and NFTs, and (2) norepinephrine transporters. The compounds can be modified for various types of readout methods.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,180,212	11/10/2015	2012-664