

Near-infrared molecular imaging for monitoring therapy in AD mouse models

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USA

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Near-infrared molecular imaging for monitoring therapy in AD mouse models

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2

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Research Abstract

? DESCRIPTION (provided by applicant): 1. The need of widely applicable imaging methods for AD drug development at the preclinical stage: PET imaging with A β specific tracers has been widely applied in clinical trials and three A β PET tracers have been approved by FDA for clinical

use. PET imaging is an emerging tool for preclinical AD research as well. However, its application for monitoring drug treatment in small animals is limited, due to the following reasons: 1) the high cost of PET probe synthesis and PET scanning, 2) radioactive material practice, and 3) the insufficiency of current A β PET tracers that are only sensitive for insoluble A β s, but not for total A β s. These factors prevent numerous labs from using PET imaging for preclinical AD therapeutic studies. Near infrared fluorescence (NIRF) molecular imaging is believed to have the capacity to meet this demand due to its cost-effectiveness, speed, wide availability, and easy-to-use operation. We believe this cost-efficient technology will enable significantly more drug candidates go through preclinical animal studies, and consequentially more candidates will enter into clinical trials. 2. The need of imaging probes for both soluble and insoluble A β species: In the course of AD progression, the predominance of the subspecies changes gradually from soluble species to insoluble fibrils and plaques, however all A β species are co-existing at most of the stages. This indicates the need for probes that are sensitive to both soluble and insoluble A β s. Currently, the development of PET probes for insoluble species has been very successful. However, the availability of imaging probes for the detection of total A β s is still elusive. Our preliminary data showed that curcumin analogues CRANAD-3 and -58 have the capability of detecting not only insoluble A β species, but also soluble A β species in vitro and in vivo. In this application, we propose to validate CRANAD-3 and -58 as reliable NIRF imaging probes to monitor the efficacy of several categories of AD drug candidates in mouse models. Our ultimate goal is to establish a reliable and affordable imaging platform that will be widely available for AD drug discovery community.

Further information available at:

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