

MULTIFUNCTIONAL CHEMICAL AGENTS FOR METAL CHELATION, POSITRON EMISSION TOMOGRAPHY (PET) IMAGING, FLUORESCENCE IMAGING, AND AMYLOID PLAQUE CLEARANCE IN ALZHEIMER'S DISEASE

[Mirica, Liviu](#), [Schultz, Jason](#), [Sharma, Anuj](#)

[Poranki, Deepika](#)

T-013190

Alzheimer's disease (AD) is characterized by the deposition of amyloid plaques containing the amyloid beta ($A\beta$) peptide. Currently, no treatment is available for AD. Metal ion interactions of the $A\beta$ peptide are believed to help formation of toxic aggregates. Developing chemical compounds that will take care of $A\beta$ aggregation and control abnormal metal interaction are therefore highly demanded. To this end, several multi-functional compounds have been developed in our laboratory and tested for the following major applications:

$A\beta$ plaques and metal binding: Our compounds have strong affinities for $A\beta$ peptides aggregates and metal ions, as demonstrated in our laboratory. To the best of our knowledge, there is no other report for such a high affinity ligand for both the plaques and metal ions. Compounds reduce the amyloid plaque formation and can be used as therapeutic agents for AD.

Fluorescence imaging of $A\beta$ plaques: The compounds are highly fluorescent and can be used in imaging applications in vitro. We have used these compounds to image synthetic $A\beta$ plaques and also in the brain slices of Tg2576 APP transgenic mice.

Positron emission tomography (PET) imaging: Some of the developed compounds bind very strongly copper ions and can thus be used in the synthesis of ^{64}Cu PET imaging agents for the detection of $A\beta$ plaques in humans. Overall, these compounds have various potential applications as therapeutic or diagnostic agents for Alzheimer's disease.