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In vivo diagnosis and therapy of Alzheimer's disease

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Alzheimer's disease (AD) is a progessive neurodegenerative disorder. The 'amyloid cascade hypothesis' assigns the amyloid-beta-peptide (Abeta) a central role in the pathogenesis of Alzheimer's disease. We searched for peptides consisting of the D-enantiomers of amino acids (D-peptides) that bind to Abeta (1–42). D-peptides are thought to be protease resistant and less immunogenic than the respective L-enantiomers and can be identified by mirror image phage display. We carried out a screening of a randomized 12 mer peptide library and identified a dominating D-peptide (D-pep). *In vitro* experiments verified binding of D-pep to naturally occuring Abeta and showed positive influence of D-pep on Abeta cytotoxicity. *In vivo* experiments in transgenic mice suggest D-pep to cross the blood-brain-barrier and to reduce Abeta loads in the living brain.