

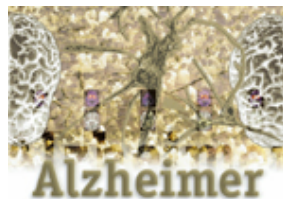
INNOTEST™ hTAU Ag

INNOTEST™ hTAU Ag is an ELISA micro plate assay for the quantitative determination of human tau antigen in human cerebrospinal fluid (CSF).

Combined use of CSF-tau and CSF-A β 42 markers results in a high sensitivity and specificity for Alzheimer's disease versus normal aging and other neurological disorders (1, 2, 3, 4, 5)

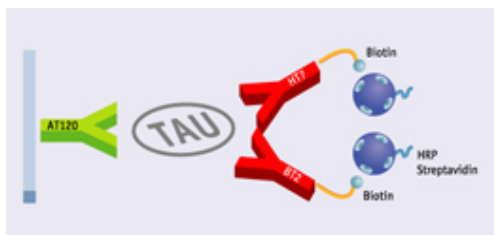
Article number: 80005

Number of tests: 1 plate of 96 tests (8-well strips)



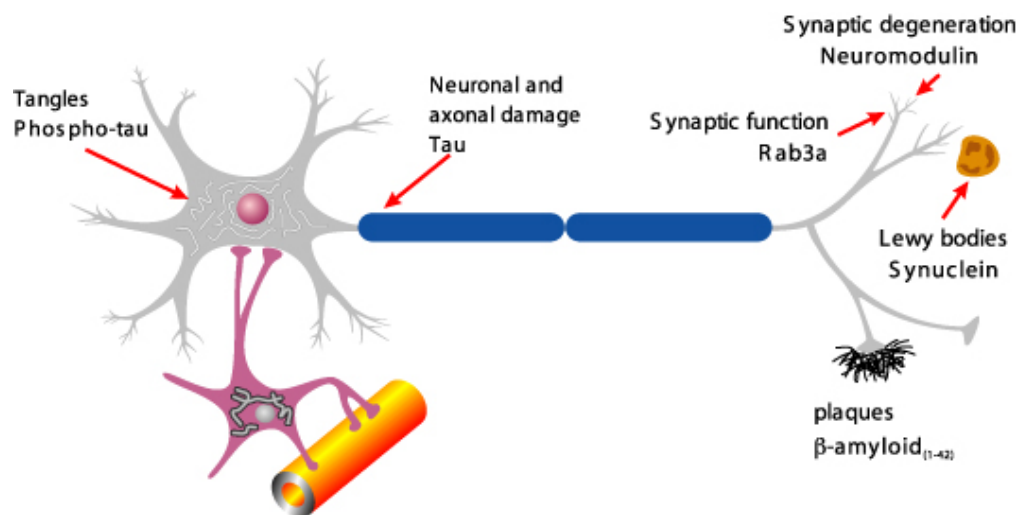
Easy, reliable and specific quantification of CSF-tau. The combined use of CSF-tau and CSF-A β 42 markers allows differentiation between AD and normal aging/other neurologic disorders.

Features & Benefits:



- **Convenient**
User-friendly enzyme immunoassay
- **Easy**
Minimum of handling steps
25 μ l of CSF, duplo testing is strongly recommended and requires 2x25 μ l of CSF
- **Reliable**
Reproducible results within the standards range
- **Broad assay range**
Lowest detection limit: 60 pg/ml
Standards range: 75 to 1200 pg/ml
- **Clinical utility:**
High sensitivity and specificity for the differentiation of Alzheimer's disease from normal aging or other neurological disorders such as depression, when used in combination with CSF-A β 42 (1, 2, 3, 4, 5).

Background:



Alzheimer's disease (AD) can be considered as being the most important of all neuronal degenerative diseases because of its frequent occurrence (accounting for 60% of all senile dementias) (6) and devastating consequences. Given the gradual aging of the population and an exponential increase in the prevalence of AD after the age of 65 (from 5% at age 75-79 to 19% at age 85-89) (6, 7), the detection of AD is one of today's major challenges for healthcare. AD diagnosis is based on the presence of characteristic clinical features, the exclusion of other causes of dementia, and post-mortem confirmation. Current diagnostic criteria for probable AD, such as the NINCDS-ADRDA (8) or DSM-IV (9), lack the necessary specificity and sensitivity to discriminate AD from other causes of dementia such as vascular dementia (VAD), dementia with Lewy bodies (DLB), or co-existing Parkinson's disease (PD). Clinico-pathological studies reveal accuracy rates between 63% and 90% at academic medical centers (10, 11). As specific therapeutic options are currently emerging, there is a definite need to seek means of improving diagnostic approaches.

The two most widely recognized pathological features of AD, although not 100% specific, are senile plaques and neurofibrillary tangles in the brain (12, 13). These features also seem to correlate with the degree of dementia. Since biochemical changes in the brain are known to alter the composition of cerebrospinal fluid (CSF), tests based on the quantitative detection of these features in CSF may be helpful in the diagnosis of Alzheimer's disease.

Senile plaques consist largely of an insoluble peptide called β -amyloid ($A\beta$).

The main type of β -amyloid is $A\beta$ 42, a sticky protein fragment abnormally cleaved from a larger precursor protein called amyloid precursor protein or APP. Amyloid deposits are sparsely found in different regions of the normal aging brain, between the brain's nerve cells, but become increasingly more abundant in the initial and subsequent stages of AD. As a result, β -amyloid(1-42) concentrations in the CSF of AD patients are significantly lower compared to age-matched controls (14).

Tangles are mainly composed of abnormal aggregations of tau protein. Normally, this protein is abundantly present in neurons where it serves to stabilize the microtubular network in the axons (15). In Alzheimer's disease, and particularly in those brain regions affected, the tau protein becomes abnormally phosphorylated, and this hyperphosphorylated form twists itself into paired helical filaments. These filaments aggregate to form the neurofibrillary tangles. When this happens, tau can no longer fulfil its stabilizing function, resulting in a collapse of the cell's internal transport, communication malfunction between nerve cells, and neuronal loss.

Since tau is normally an intracellular protein, the amount found in cerebrospinal fluid (CSF) is low. However, in Alzheimer's disease, the slow neurodegenerative process leads to increased neuronal loss which may give rise to increased tau levels in CSF.

The development of high affinity monoclonal antibodies highly specific for tau, tau phosphorylated at threonine 181, and specifically recognizing well-defined epitopes of $A\beta$ has led to simple tests for the quantification of tau (INNOTEST™ hTAU Ag) (16), phosphorylated tau (INNOTEST™ PHOSPHO-TAU(181P)) (17) and $A\beta$ 42 (INNOTEST™ β -AMYLOID(1-42)) (18) in CSF.

Reference values for both CSF-tau and CSF- $A\beta$ 42 have been established (19). Multi-center studies and meta-analysis in the United States (2, 5) and Japan (3), as well as an international multi-center study (1), consistently found that the combined use of CSF-tau and CSF- $A\beta$ 42 marker quantification

results in a high sensitivity and specificity (> 80%) to distinguish AD patients from healthy controls and other neurological disorders like depression. These results confirm the added value of biomarkers, especially in the light of the Consensus guidelines, established by the Working Group on Molecular and Biochemical Markers for AD (20) stating that a useful biomarker should have a sensitivity of more than 80% for detecting AD and a specificity of more than 80% for distinguishing other dementias. The value of CSF-tau, CSF-A β 42, and CSF-phospho-tau in differential and early diagnosis has been described in several studies (21, 22, 23, 24, 25).

These tests may also prove to be of value in monitoring long-term effects of disease-modifying therapies.

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Publications

- [Basic and Clinical Studies on the Measurement of Tau Protein in Cerebrospinal Fluid as a Biological Marker for Alzheimer's Disease and Related Disorders: Multi center Study in Japan.](#)
- [Cerebrospinal fluid tau and A \$\beta\$ 42 as predictors of development of Alzheimer's disease in patients with mild cognitive impairment.](#)
- [Improved discrimination of AD patients using \$\beta\$ -amyloid\(1-42\) and tau levels in CSF.](#)
- [Levels of TAU protein in cerebrospinal fluid are correlated with neuronal loss in Alzheimer's disease.](#)
- [Are elevated CSF tau levels in Alzheimer patients related to clinical parameters?](#)
- [CSF tau is related to apolipoprotein E genotype in early Alzheimer's disease.](#)
- [Phosphorylated tau in cerebrospinal fluid as marker for Creutzfeldt-Jacob disease](#)

- CSF-phospho-tau (181P) as a promising marker for discriminating Alzheimer's disease from dementia with Lewy bodies.
- Highly increased CSF tau protein and decreased β -amyloid (1-42) in sporadic CJD: a discrimination from Alzheimer's disease?
- CSF markers for the diagnosis of Alzheimer's disease.
- Effects of cholinesterase inhibitors on Alzheimer's disease biomarkers.

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- Complaint resolution

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