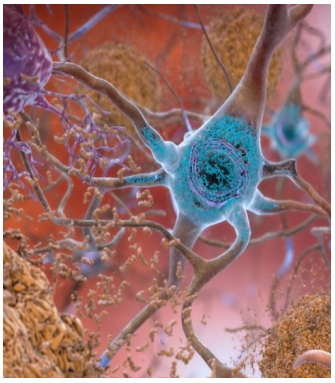
Advanced ImmunoChemical Inc.
Providing for the Advancement of Medical Science

ASSAY NOTES
Product Information

Courtesy of HyTest, Ltd

Beta-Amyloid 1–42



Alzheimer's disease (AD) is a complex progressive neurodegenerative disease that affects approximately 14 million people in the United States and Europe, including almost one half of the population aged 85 years and over (43%).

Alzheimer's disease is the most common cause of dementia and is characterized by a neuroaxonal and synaptic degeneration that is accompanied by intraneuronal neurofibrillary tangles and the accumulation of extracellular plaques in specific brain regions. These features are reflected in the AD cerebrospinal fluid (CSF) by decreased concentrations of β(beta)amyloid. βamyloid is produced by the proteolytic cleavage of amyloid precursor protein, which is a large transmembrane protein that appears to be involved in synaptic plasticity and learning. The cleavage of this protein generates varying lengths of βamyloid peptides (38–43 amino acids) that accumulate in the extracellular space to form extracellular plaques. Of these peptides, βamyloid 1–42 (Aβ42) is the major form that is associated with AD.

β-amyloid 1-42 as a biomarker in diagnostics

CSF levels of Aβ42 have been shown to have diagnostic utility for discriminating AD dementia cases from cognitively normal controls at the earliest stages of disease progression. Aβ42 drops significantly 5-10 years prior to the establishment of cognitive impairment symptoms. Aβ42 can be used for diagnostics of AD in both the prodromal and dementia stage of the disease, and is now included in the diagnostic research criteria for AD.

CLINICAL UTILITY

- **Alzheimer's disease**

Monoclonal antibodies specific to β-amyloid

We offer well characterized human beta amyloid-specific mouse monoclonal antibodies (MAbs) for the detection of Aβ42 in human CSF. These antibodies were developed against synthetic peptides that correspond to fragments of the Aβ42 sequence.

Quantitative and highly specific sandwich immunoassays for β-amyloid

Two MAb combinations are recommended for the development of a sandwich immunoassay to measure Aβ42 in human CSF samples: BAM7cc–BAM113cc and BAM7cc–BAM120cc. Both of the assay prototypes are capable of detecting native βamyloid in human CSF. Limit of detection values are provided in Table 1.

The specificity of assays BAM7cc-BAM113cc and BAM7cc-BAM120cc was confirmed using different synthetic human βamyloid peptides. Cross reactivity to Aβ40, Aβ41 and Aβ43 was very low as denoted in Table 2.

Table 1. Recommended capture-detection pairs. Data is based on the results that were obtained using a sandwich chemiluminescence immunoassay (CLIA).

Capture MAb	Detection MAb	LoD (pg/ml)
BAM7cc	BAM113cc	5.3
BAM7cc	BAM120cc	13.4

Table 2. Cross-specificity of the prototype assays to different synthetic human β-amyloid peptides.

Synthetic peptide	BAM7cc-BAM113cc	BAM7cc-BAM120cc
β-amyloid 1-40 (Aβ40)	0.01%	0.004%
β-amyloid 1-41 (Aβ41)	0.6%	0.4%
β-amyloid 1-43 (Aβ43)	0.11%	0.07%

The calibration curves for the prototype assays are provided in Figure 1.

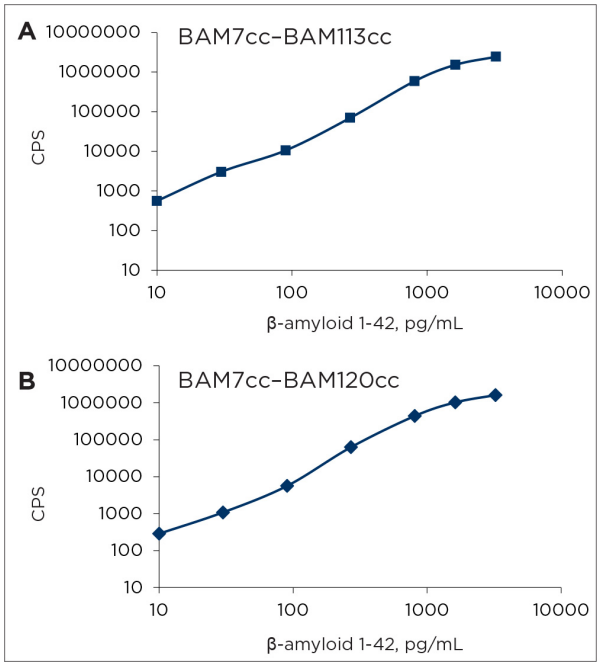


Figure 1. Calibration curves for the MAb pairs BAM7cc– BAM113cc (A) and BAM7cc-BAM120cc (B). *The capture antibody BAM7cc was coated onto a Costar EIA/RIA black plate in PBS and incubated at RT for 40 minutes. Synthetic human βamyloid 142 (AnaSpec Cat.# AS 24224) and the biotinylated detection MAb BAM120cc (or BAM 113cc) were diluted in a PBST bu er containing 7.5% BSA and 0.1% Tween20, and incubated for 1 hour at RT. After washing, the plates were incubated with Streptavidin polyHRP for 5 minutes and washed again. SuperSignal ELISA Femto Maximum Sensitivity Substrate was added, and the luminescence was measured using a Victor Multi Label Counter.*

Measuring patient CSF samples

Correlation studies between assay prototypes and the commercially available INNOTEST® βAMYLOID(142) assay were obtained with CSF samples from 30 patients of different ages (ranging from 45 to 90 years).

Figure 2 shows correlation studies between the prototype immunoassays and INNOTEST βAMYLOID(142).

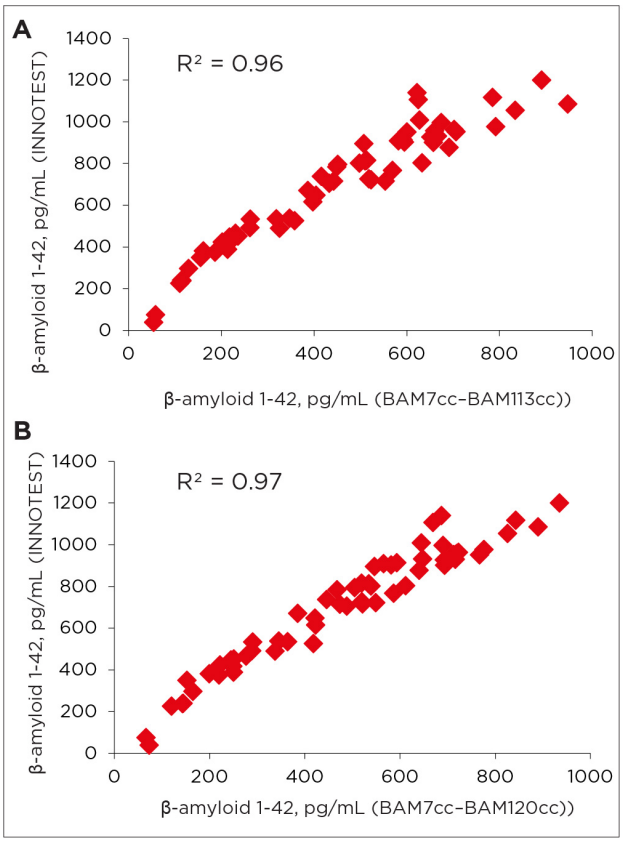


Figure 2. Correlation studies between the immunoassays BAM7cc–BAM113cc (A) and BAM7cc– BAM120cc (B) and INNOTEST β-AMYLOID(1-42) assay. *The correlation coefficients (Pearson) between the assays and the INNOTEST assay are provided in the picture.*

Ordering Information:

MONOCLONAL ANTIBODIES

Product	Cat #	MAbs	Subclass	Remarks
Beta-amyloid, human	2-BA	BAM7cc	IgG1	*In vitro*, EIA
		BAM113cc	IgG1	*In vitro*, EIA
		BAM113cc	IgG1	*In vitro*, EIA

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