

Description

Aβ40 is a 40 amino acid proteolytic product from the amyloid precursor protein (APP) that has gained attention as a biomarker correlating with Alzheimer disease (AD) onset, mild cognitive impairment, vascular dementia, and other cognitive disorders. Beta-secretase cleavage of APP initially results in the production of an APP fragment that is further cleaved by gamma-secretase at residues 40-42 to generate two main forms of amyloid beta, Aβ40 and Aβ42. Amyloid beta (Aβ) peptides (including a shorter Aβ38 isoform) are produced by different cell types in the body, but the expression is particularly high in the brain. Accumulation of Aβ in the form of extracellular plaques is a neuropathological hallmark of AD and believed to play a central role in the neurodegenerative process. Aβ40 is the major amyloid component in these plaques and is thought to be an initiating factor of AD plaques. In healthy and disease states Aβ40 is the most abundant form of the amyloid peptides in both cerebrospinal fluid (CSF) and plasma (10–20X higher than Aβ42). Studies suggest that a decrease in the ratio of Aβ42/Aβ40 may indicate AD progression.

Calibration Curve: Calibrator concentrations and Lower Limit of Quantification depicted.

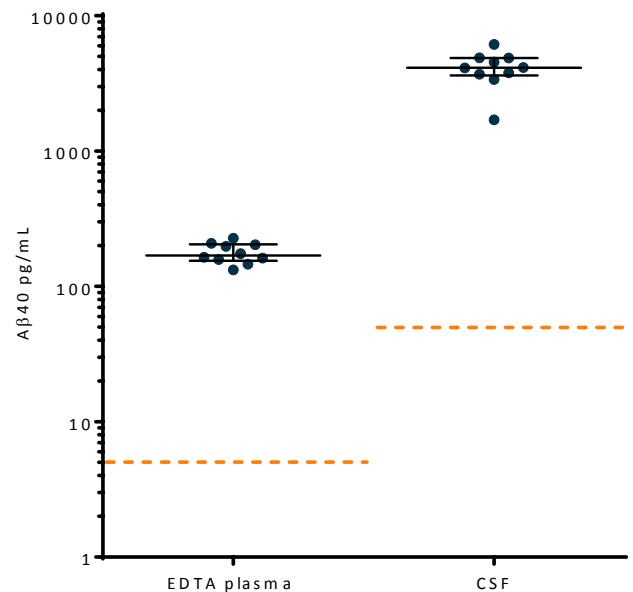
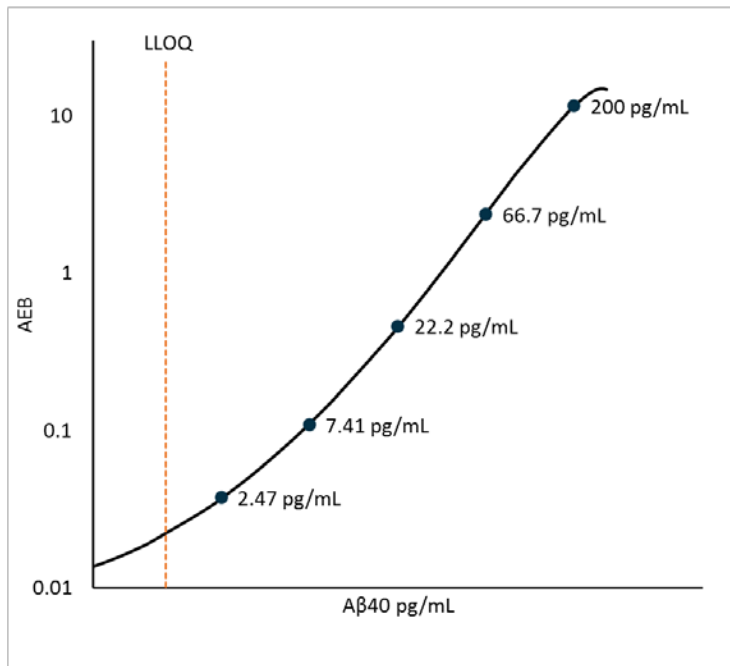
Lower Limit of Quantification (LLOQ): Triplicate measurements of serially diluted calibrator were read back on the calibration curve over 3 runs each for 1 reagent lot across 2 instruments (6 runs total).

Limit of Detection (LOD): Calculated as 2.5 standard deviations from the mean of background signal read back on each calibration curve over 3 runs each for 1 reagent lot across 2 instruments (6 runs total).

LLOQ	1.24 pg/mL pooled CV 16% mean recovery 103%
LOD	0.170 pg/mL range 0.0923-0.286 pg/mL
Dynamic range (plasma)	0–800 pg/mL
Dynamic Range (CSF)	0-8000 pg/mL
Diluted Sample volume*	100 μL per measurement
Tests per kit	96

*Plasma diluted 1:4 and CSF diluted 1:40. See Kit Instruction for details

Endogenous Sample Reading: Healthy donor EDTA plasma (n=10) and unmatched CSF (n=10) samples were measured. Bars depict median with interquartile range. Orange lines represent functional LLOQ.



Sample Type	Mean Aβ40 pg/mL	Median Aβ40 pg/mL	% Above LOD
EDTA plasma	177	169	100%
CSF	4125	4128	100%

Precision: Measurements of 2 plasma based panels and 2 calibrator-based controls. Triplicate measurements were made for 3 runs each for 1 reagent lot across 2 instruments (6 runs total, 18 measurements).

Sample	Mean (pg/mL)	Within run CV	Between run CV	Between inst CV
Control 1	25.1	3.6%	4.4%	5.2%
Control 2	345	3.9%	5.9%	2.9%
Panel 1	185	3.7%	4.4%	3.2%
Panel 2	35.8	3.7%	6.4%	1.0%

Spike and Recovery: 2 EDTA plasma samples were spiked at high and low concentrations within the range of the assay and analyzed on SR-X.

Dilution Linearity: An endogenous plasma sample was diluted 2x serially from MRD (4x) to 128x with sample diluent. An endogenous CSF sample was diluted serially from MRD (40x) to 2560x with sample diluent.

Spike and Recovery	Mean = 84% Range: 81-86%
Plasma Dilution Linearity (128x)	Mean = 104% Range: 102-107%
CSF Dilution Linearity (2560x)	Mean = 93% Range: 87–99%

The Simoa Aβ40 assay kit is formulated for use on either the SR-X or HD-1 platform. Data in this document was obtained from runs on the SR-X platform unless otherwise noted. Some differences in performance claims between the HD-1 and SR-X may be observed when comparing datasheets for the two platforms. This may be due to experiments run at different time-points with different reagent lots and different samples, or may be due to minor differences in antibody and analyte behavior in the different assay formats.