Simoa® sTREM-2 Advantage PLUS Kit

HD-X Data Sheet

Item # 104542

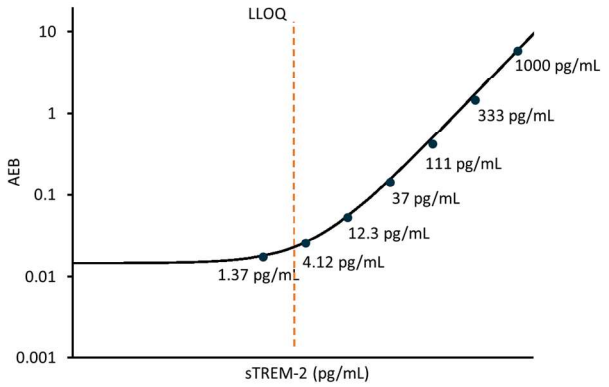
Quanterix
Discovery Fueled by Ultra-Sensitivity

Description

The datasheet summarizes analytical validation performed at Quanterix to characterize performance of the sTREM-2 Advantage PLUS kit on the HD-X platform.

Triggering Receptor Expressed on Myeloid Cells 2 (TREM-2) is a transmembrane immunomodulatory receptor with a central role in myeloid cell activation and survival. TREM-2 is essential for phagocytosis of apoptotic neurons and amyloid plaques formation. TREM-2 is expressed on macrophages across different tissues and contributes to several physiological and pathological processes *(1-2)*.
sTREM-2 is the soluble product of the regulated proteolytic cleavage of the membrane associated TREM-2. Levels of sTREM-2 in plasma and CSF have been reported to be elevated in early stages of Alzheimer's Disease (AD). sTREM-2 has also been implicated in cancer, Atherosclerosis, Obesity, Parkinson's disease, Multiple sclerosis, Hepatic disorders *(3-6)*. The Simoa sTREM-2 Advantage PLUS assay is a digital immunoassay for the quantitative determination of sTREM-2 in EDTA-plasma and CSF.

Calibration Curve: Representative calibrator concentrations and Lower Limit of Quantification (LLOQ) depicted. For sTREM-2 Advantage PLUS, the reconstitution volume for calibrator concentrates may vary between kit lots, while keeping the target calibrator concentrations each level as consistent as possible. The minimum allowable concentration for Cal H is 1000 pg/mL and the maximum allowable concentration for Cal B is 1.37 pg/mL.



Minimum Required Dilution (MRD)

Diluted Sample Volume	100 µL per measurement
Human EDTA-Plasma and CSF Dilution	1:16
Tests per kit	96

See Kit Instruction for details.

Lower Limit of Quantification (LLOQ): Triplicate measurements of serially diluted calibrator were read back on the calibration curve over 12 runs each for 2 reagent lots across 2 instruments (3 runs per lot, per instrument). The analytical LLOQ was set at the lowest concentration that read back within 80 – 120% of the expected value with a CV < 20%. The functional LLOQ (fLLOQ) values below are for plasma and CSF and represent the analytical LLOQ multiplied by the dilution factor used for the respective matrix (Table).

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

Assay Range: The upper end of the dynamic range, or functional Upper Limit of Quantification (ULOQ) is equal to the minimum top calibrator concentration multiplied by MRD.

Analytical LLOQ	**4.12 pg/mL** pooled CV 19% mean recovery 109%
Functional LLOQ (EDTA-plasma and CSF)	**65.92 pg/mL**
Functional ULOQ (EDTA-plasma and CSF)	**16,000 pg/mL**
LOD	**0.905 pg/mL** Range 0.023 - 1.878 pg/mL

Endogenous Sample Reading: Concentrations (pg/mL) were determined for normal human EDTA Plasma (n=20) and unmatched normal human CSF (n=20) using the sTREM-2 Advantage PLUS kit on HD-X. Bars depict median with interquartile range. The red lines represent functional LLOQ.

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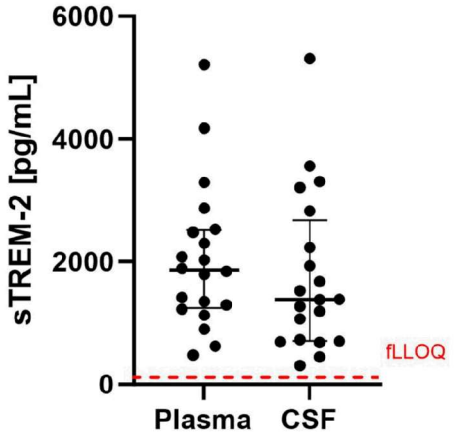

Sample Type	Mean sTREM-2 pg/mL	Median sTREM-2 pg/mL	% Above LOD	% Above LLOQ
Human EDTA Plasma	2045	1896	100%	100%
Human CSF	1771	1384	100%	100%

Precision: Measurements of 2 human EDTA plasma-based panels, and 2 calibrator-based controls were measured for precision. Triplicate measurements were made for 6 runs each for 2 reagent lot across 2 instruments (12 runs total, 36 measurements). All samples were diluted at the appropriate MRD for the sample matrix.

Sample	Mean (pg/mL)	Within run CV	Between run CV	Between inst CV	Between Lot CV
Control 1	350	4.6%	7.1%	0.8%	3.9%
Control 2	3913	5%	9.3%	3.6%	2.8%
Panel 1	359	6.9%	10.6%	2.2%	9.3%
Panel 2	4698	5.4%	6.3%	1.4%	3.5%

Spike and Recovery: Two normal human samples for each matrix (EDTA plasma and CSF) were spiked at high (8000 pg/mL) and low (3200 pg/mL) concentrations within the range of the assay and analyzed on HD-X. Percent recovery is defined as the difference between the measured concentration of sTREM-2 in the spiked sample and the measured concentration in unspiked sample relative to the concentration of sTREM-2 in spiked calibrator diluent.

Dilution Linearity: Four human samples for each matrix (EDTA- plasma and CSF) were serially diluted with sample diluent through 5 levels of 2X dilutions. Each dilution series was run on the HD-X with two different lots of sTREM-2 Advantage PLUS assay kits with the MRD (16X) dilution applied. The total dilution of each human EDTA-plasma or CSF sample ranged from 16X to 256X.

Spike and Recovery (Human EDTA-Plasma)	**Mean 85%** Range 77 – 98%
Spike and Recovery (Human CSF)	**Mean 105%** Range 99 – 108%
Dilution Linearity (Human EDTA Plasma, 16x - 256x)	**Mean 96%** Range 72 – 119%
Dilution Linearity (Human CSF, 16x - 256x)	**Mean 101%** Range 83 – 121%

The Simoa sTREM-2 Advantage PLUS assay kit is developed and optimized on HD-X platform. Verification and validation results summarized above were generated using fully automated HD-X instrument.

References:

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3. Jiahuan X, Ying Z, Hongyu J, et al. 2022. Serum sTREM2: A Potential Biomarker for Mild Cognitive Impairment in Patients With Obstructive Sleep Apnea. *Front Aging Neurosci* 14:843828

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