Quanterix™
The Science of Precision Health

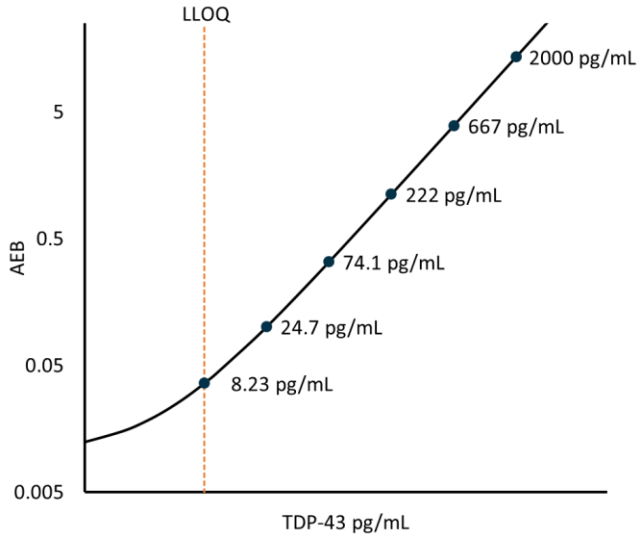
Simoa™ TDP-43 Kit
SR-X™ Data Sheet

Item 103293

Description

The TAR DNA binding protein of 43 kDa (TDP-43 or TARDBP) is a highly conserved and ubiquitously expressed nuclear protein with roles in transcription and splicing regulation. It is also the major component of ubiquitin-positive cytoplasmic inclusions found in the brains of patients with frontotemporal lobar degeneration (FTLD) and amyotrophic lateral sclerosis (ALS). In addition, TDP-43-containing aggregates are found in a significant number of patients with Alzheimer's Disease (AD) and other neuromuscular disorders. The majority of TDP-43 protein found in cytoplasmic inclusions is truncated, and it has been shown that the C-terminal domain is intrinsically prone to aggregation. Mutations in the C-terminal region of the TDP-43 gene have been associated with both ALS and FTLD, and are thought to facilitate ubiquitination and phosphorylation of the TDP-43 protein, leading to the formation of pathological inclusions and eventual neurodegeneration. Analysis of TDP-43 levels in plasma may allow the indexing of TDP-43 pathology within the brain to aid in the diagnosis of different forms of dementia and distinguish between TDP-43 proteinopathy and tauopathy. The Simoa TDP-43 assay has been developed with a full-length protein calibrator and antibodies against AA 203 – 209 and the C-terminal region; it is expected to detect both full-length and pathological, truncated forms of the protein.

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



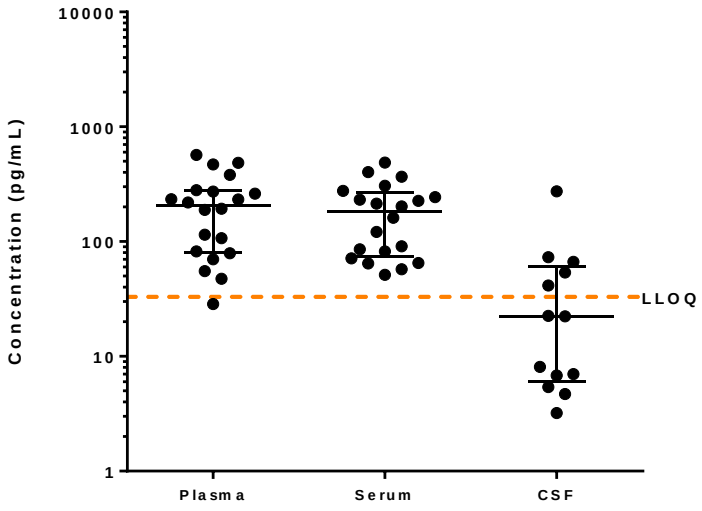
Lower Limit of Quantification (LLOQ): Triplicate measurements of serially diluted calibrator were read back on the calibration curve over 6 runs each for 1 reagent lot across 2 instruments (6 runs total).

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

Analytical LLOQ	**8.23 pg/mL** pooled CV 11% mean recovery 112%
LOD	**0.780 pg/mL** range 0.019-1.59 pg/mL
Dynamic range (serum and plasma)	0 - 8000 pg/mL
Diluted Sample volume*	100 µL per measurement
Tests per kit	96

***See Kit Instruction for details**

Endogenous Sample Reading: Healthy donor matched EDTA plasma (n=20), and serum (n=20) were measured. 13 CSF samples were measured. Bars depict median with interquartile range. Orange line represents functional LLOQ.



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Assay designed by Dandan

Sample Type	Mean TDP-43 pg/mL	Median TDP-43 pg/mL	% Above LOD
Serum	191	182	100%
Plasma	228	206	100%
CSF	102	22.3	100%

Precision: Measurements of 1 plasma-based panel, 3 serum-based panels and 2 calibrator-based controls. Triplicate measurements were made for 6 runs each for 2 reagent lots across 2 instruments (12 runs total, 36 measurements).

Sample	Mean (pg/mL)	Within run CV	Btwn run CV	Btwn inst CV	Btwn lot CV
Control 1	176	5.8%	5.5%	4.0%	1.1%
Control 2	1837	4.7%	4.9%	1.0%	4.4%
Panel 1	69.6	13.7%	9.9%	3.1%	7.5%
Panel 2	82.9	12.2%	14.2%	0.0%	9.4%
Panel 3	363	8.1%	10.9%	7.0%	0.1%
Panel 4	1941	4.9%	14.4%	10.2%	1.4%

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

Observed recovery was consistently low in serum and plasma, but results from dilutional linearity and immune-depletion experiments support specificity of the assay signal.

Dilution Linearity: 2 endogenous EDTA plasma, 2 endogenous serum and 2 spiked CSF samples were diluted 2X serially with Sample Diluent from MRD to 32x in serum/plasma and from MRD to 64x in CSF.

Spike and Recovery (Serum/Plasma)	**Mean = 52%** Range: 38-60%
Dilution Linearity (Serum/Plasma) (32x)	**Mean = 111%** Range: 91–123%
Spike and Recovery (CSF)	**Mean = 86%** Range: 74-96%
Dilution Linearity (CSF) (64x)	**Mean = 111%** Range: 100–121%

Immuno-depletion: 1 Serum and 2 plasma samples were separately incubated with TDP-43 beads and Antibody isotype control beads prior to analysis on SR-X. Mean depletion was 100%.

The Simoa TDP-43 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.

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