Quanterix™
The Science of Precision Health

Description

Brain Derived Neurotrophic Factor (BDNF) is a member of the neurotrophin family, which includes NGF, NT-3, and NT-4/5. This family is likely derived from a common ancestral gene and shares similar sequences and structures. BDNF has a molecular weight of ~27 kDa and exists as a homodimer. It shares a common cysteine knot structure with the other members of the neurotrophin family. BDNF has a precursor peptide known as proBDNF, and during processing the cleaved pro-domain is packaged and co-secreted with the mature BDNF form. The effects of proBDNF are less defined than those of the mature BDNF form. BDNF's effects are mostly mediated through the TrkB receptor, though it can also bind to a pan-neurotrophin receptor known as p75. BDNF is associated with almost all aspects of the nervous system, promoting neuronal survival and differentiation, modulating synaptic plasticity, synapse formation, neuronal excitability, LTP, etc. It has important roles within the development of the nervous system into adulthood. Several studies have demonstrated possible links to various disease states and conditions including: Alzheimer's disease, OCD, depression, Huntington's disease, schizophrenia and dementia.

Calibration Curve: Calibrator concentrations and Lower Limit of Quantification depicted.
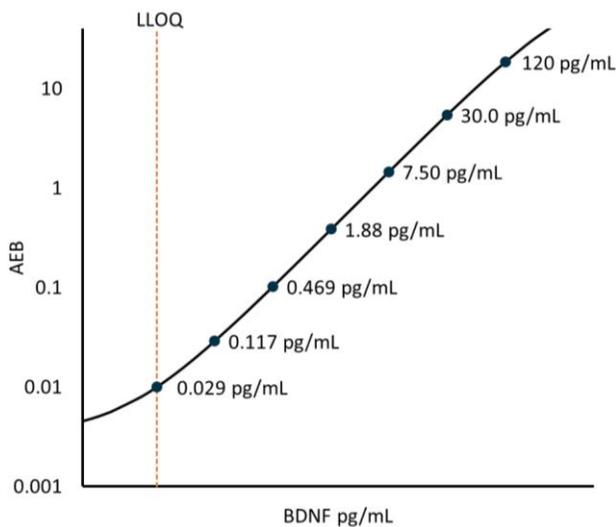
Lower Limit of Quantification (LLOQ): Triplicate measurements of serially diluted calibrator were read back on the calibration curve over 5 runs each for 1 reagent lot across 3 instruments (5 runs total).

Limit of Detection (LOD): Calculated as 2.5 standard deviations from the mean of background signal read back on each calibration curve over 5 runs each for 1 reagent lot across 3 instruments (5 runs total).

LLOQ	**0.0293 pg/mL** pooled CV 19.6% mean recovery 110%
LOD	**0.0042 pg/mL** range 0.0026-0.0060 pg/mL
Dynamic range	Serum and Plasma: 0-60,000 pg/mL CSF: 0-240 pg/mL
Diluted Sample volume*	100 µL per measurement
Tests per kit	192

***See Kit Instruction for details**

Endogenous Sample Reading: Healthy donor matched EDTA plasma (n=10) and serum (n=10) were measured, as well as CSF (n=10). Bars depict median with interquartile range. Orange line represents functional LLOQ.
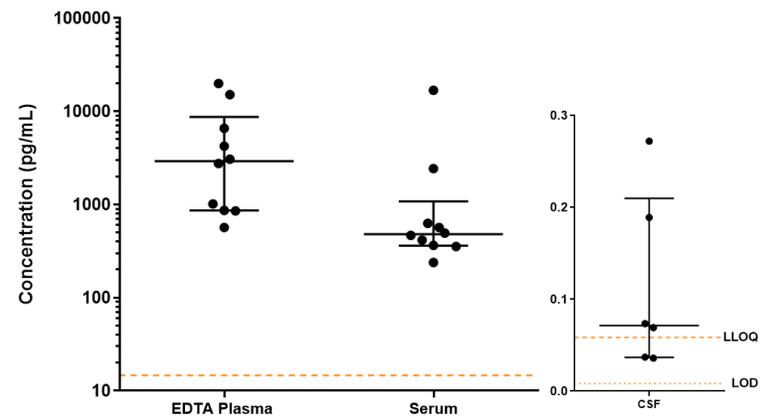
Sample Type	Mean BDNF pg/mL	Median BDNF pg/mL	% Above LOD	% Above LLOQ
Plasma	5511	2920	100%	100%
Serum	2286	481	100%	100%
CSF	*0.151	0.071	100%	67%

*Values below LLOQ not included in mean calculation

Precision: Measurements of 3 serum-based panels and 2 calibrator-based controls. Triplicate measurements were made for 5 runs each for 1 reagent lot across 3 instruments (5 runs total, 15 measurements).

Sample	Mean (pg/mL)	Within run CV	Between run CV	Between inst CV
Control 1	27.6	9.2%	10%	4.3%
Control 2	0.811	1.9%	10%	9.2%
Panel 1	2167	3.3%	20%	24%
Panel 2	653	4.2%	10%	10%
Panel 3	457	5.6%	14%	9.1%

Dilution Linearity: 1 endogenous EDTA plasma and 1 endogenous serum sample were diluted 2x serially from MRD (500x) to 32,000x with Sample Diluent.

Dilution Linearity (32,000x)	Mean = 102.3% Range: 88.1–110%

The Simoa BDNF assay kit is formulated for use on the SR-X®, HD-1, or HD-X® platform. Data in this document was obtained from runs on the HD-1 platform unless otherwise noted. Some differences in performance claims between SR-X and HD-1/HD-X may be observed when comparing datasheets for these 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.