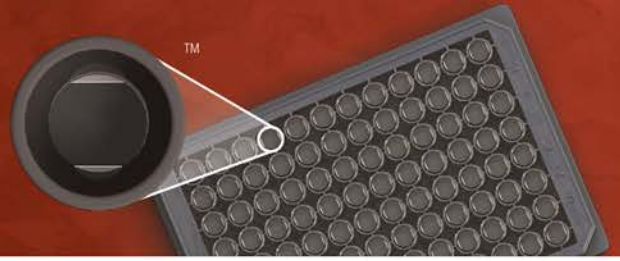
MSD® Rat BNP Assay Kit

For quantitative determination in rat serum and plasma



Alzheimer's Disease
BioProcess
Cardiac
Cell Signaling
Clinical Immunology
Cytokines
Hypoxia
Immunogenicity
Inflammation
Metabolic
Oncology
Toxicology
Vascular

Catalog Numbers

Rat BNP Assay Kit	
Kit size	
1 plate	K153KFD-1
5 plates	K153KFD-2
25 plates	K153KFD-4

Ordering information

MSD Customer Service
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Company Address

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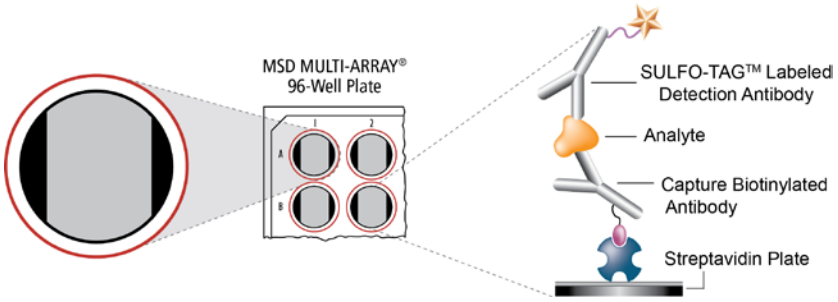

Brain natriuretic peptide (BNP), also known as B-type natriuretic peptide or GC-B, was first isolated from the porcine brain and contains either 26 (BNP-26) or 32 (BNP-32) amino acid residues.[1] In contrast, human and rat BNPs are produced mostly in the heart and the predominant circulating forms consist of 32 and 45 (BNP-45) amino acids respectively. BNP mRNA is not detected in the rat brain, whereas it can be detected in the human brain.[2-4] Thus, there is a substantial difference in the distribution and processing of BNP in different species. The MSD Rat BNP Assay has been optimized for specific and accurate measurement of BNP-45 in serum and plasma samples.

BNP is released into the blood stream when ventricle walls undergo stretch or strain due to increased pressure. Studies have indicated that the levels of BNP are elevated in the plasma of patients with congestive heart failure. Additionally, its levels correlate to the severity of the condition.[5] The measurement of BNP levels can be used in primary care for accurate and rapid diagnosis of heart failure, and for risk stratification of patients suffering from heart attack in emergency care.[6,7] It are also used to assess the effectiveness of treatment for heart failure. Thus, BNP serves as a promising serum and plasma biomarker for cardiac dysfunction and tissue repair.[8,9]

The MSD Rat BNP Assay is available on 96-well Streptavidin coated plates. This datasheet outlines the performance of the assay.

Assay Sensitivity

	BNP (pg/mL)
LLOD	1.5

The lower limit of detection (LLOD) is measured as the concentration at 2.5 standard deviations over the blank (zero calibrator).

MSD Advantage

- **Mutiplexing:** Multiple analytes can be measured in one well using typical sample volumes of 25 µL or less without compromising speed or performance
- **Large dynamic range**: Linear range of up to five logs enables the measurement of native levels of biomarkers in normal and diseased samples without multiple dilutions
- **Minimal background:** The stimulation mechanism (electricity) is decoupled from the signal (light)
- **Simple protocols:** Only labels near the electrode surface are detected, enabling assays with fewer washes
- **Flexibility:** Labels are stable, non-radioactive, and conveniently conjugated to biological molecules
- **High sensitivity and precision:** Multiple excitation cycles of each label enhance light levels and improve sensitivity

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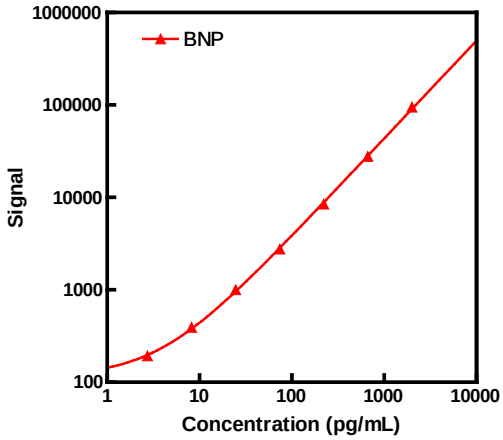
Typical Standard Curve

The following standard curve is an example of the dynamic range of the Rat BNP Assay.



	BNP	
Conc. (pg/mL)	Average Signal	%CV
0	84	3.1
2.7	193	2.1
8.2	393	2.5
25	1002	3.2
74	2760	3.3
222	8461	2.3
667	27821	2.1
2000	94549	0.3

Spike Recovery

Normal EDTA plasma and heparin plasma were spiked with the calibrator at multiple levels throughout the range of the assay. Spikes were made into neat samples, and then diluted 2-fold.

% Recovery = measured / expected x 100

	BNP			
Sample	Spike Conc. (pg/mL)	Measured Conc. (pg/mL)	Measured Conc. %CV	% Recovery
EDTA Plasma	0	26	9.0	
	100	131	1.4	104
	200	231	8.0	102
	400	428	11.3	100
	800	881	1.9	107
Heparin Plasma	0	<LLOD	37.4	
	100	105	10.3	104
	200	194	9.1	97
	400	387	3.3	97
	800	846	0.6	106

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Linearity

To assess linearity, EDTA plasma and heparin plasma samples were spiked with the calibrator and further diluted 2-fold, 4-fold, 8-fold, 16-fold, 32-fold and 64-fold prior to testing. The concentrations shown below have been corrected for dilution (concentration = measured x dilution factor). Percent recovery is calculated as the measured concentration divided by the concentration measured from the previous dilution (expected).
% Recovery = measured x dilution factor / expected x 100

		BNP		
Sample	Fold Dilution	Conc. (pg/mL)	Conc. %CV	% Recovery
EDTA Plasma	1	701	10.4	
	2	650	9.1	93
	4	589	5.9	91
	8	575	3.1	98
	16	581	1.3	101
	32	589	2.3	101
	64	572	17.2	97
Heparin Plasma	1	561	6.3	
	2	558	10.6	99
	4	553	8.3	99
	8	542	3.0	98
	16	537	1.6	99
	32	569	5.8	106
	64	552	3.6	97

Precision

Control samples of high, mid, and low levels were made by spiking calibrator into rat heparin plasma and were measured on each plate. The controls were run in triplicate on multiple days (n>3).
Average intra-plate %CV is the average %CV of the control replicates within an individual plate.
Inter-plate %CV is the variability of controls across 7 plates over 6 days.
Inter-lot %CV is the variability of controls across 2 kit lots.

	Control	Plates	Average Conc. (pg/mL)	Average Intra-plate %CV	Inter-plate %CV	Inter-lot %CV
BNP	High	14	426	3.6	7.6	7.8
	Mid	14	75	2.7	7.0	7.4
	Low	14	24	4.0	9.0	8.7

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Samples

Serum, EDTA plasma and heparin plasma samples collected from normal Sprague-Dawley rats were tested at 2-fold dilution on the Rat BNP Assay. Shown below are the median and range of concentrations for each sample set. Concentrations have been corrected for sample dilution.

Sample	Statistic	BNP
Serum	Median (pg/mL)	2.3
	Range (pg/mL)	2.0-2.5
	N	4
EDTA Plasma	Median (pg/mL)	8.7
	Range (pg/mL)	<LLOD-26
	N	12
Heparin Plasma	Median (pg/mL)	3.7
	Range (pg/mL)	<LLOD-10
	N	3

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