

## MSD<sup>®</sup> 96-Well MULTI-ARRAY<sup>®</sup> sAPP $\beta$ Assay

sAPP $\beta$  is the extracellular protein that is released from the transmembrane amyloid precursor protein (APP) upon cleavage with  $\beta$ -secretase. The remaining fragment of APP, C99, is cleaved by  $\gamma$ -secretase to release A $\beta$  peptides.

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Storage

### MSD Catalog Items

<input type="checkbox"/> Read Buffer T, (with surfactant) (4X)	RT
<input type="checkbox"/> Blocker A	RT
<input type="checkbox"/> MULTI-SPOT <sup>®</sup> 96-well 4 Spot Custom plates	2-8°C
<input type="checkbox"/> Tris Wash Buffer (10X)	2-8°C
<input type="checkbox"/> SULFO-TAG <sup>™</sup> labeled detection antibody	2-8°C
<input type="checkbox"/> sAPP $\beta$ Calibrator	≤ -70 °C

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### Other Materials & Equipment (not supplied)

- Deionized water for diluting Wash Buffer and Read Buffer
- One 250 mL bottle
- Two 50 mL tubes
- Two 15 mL tubes
- Various microcentrifuge tubes for making serial dilutions of supernatants (if desired)
- Automated plate washer, Multidrop<sup>®</sup>, or other efficient multi-channel pipetting equipment for washing 96 well plates
- Appropriate liquid handling equipment for desired throughput that must accurately dispense 25  $\mu$ L and 150  $\mu$ L into a 96-well micro plate

FOR RESEARCH USE ONLY.  
NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES.



## Protocol at a Glance

The following protocol describes the most conservative approach toward achieving highly sensitive results using MSD technology to quantify sAPP $\beta$ . The protocol takes approximately 3 to 3½ hours to complete if each reagent is prepared during the preceding incubation. All reagents can be prepared ahead of time. This lengthens the overall time required for the assay but frees up time during incubation steps.

Once desired results are achieved, the protocol can be streamlined to eliminate multiple incubation and wash steps to increase throughput.

1. Add blocking solution, incubate 1 hour, wash.
2. Add Calibrators and samples, incubate 1 hour, wash.
3. Add Detection Antibody, incubate 1 hour, wash.
4. Add Read Buffer and analyze plate.

## Detailed Instructions

*Prepare a stock of 1X Tris Wash Buffer:*

- a) 1X Tris Wash Buffer will be used throughout the assay to make other reagents as well as to wash plates. Approximately 250 mL per plate is required – more if using an automatic plate washer.
- b) In a 250 mL bottle combine:
  - 25 mL 10X Tris Wash Buffer
  - 225 mL deionized water

*Prepare Blocking Solution-A:*

- a) Prepare 20 mL per plate.
- b) In a 50 mL tube combine:
  - 20 mL 1X Tris Wash Buffer
  - 600 mg Blocker A (30 mg/mL or 3%)

*Prepare Antibody Dilution Buffer:*

- a) Prepare 3 mL per plate.
- b) In a 15 mL tube combine:
  - 1 mL Blocking Solution-A
  - 2 mL 1X Tris Wash Buffer

Begin with a MULTI-SPOT Custom plate. No pre-treatment is necessary.

**STEP 1** Add 150  $\mu$ L/well of Blocking Solution-A.

Incubate at room temperature for 1 hour.

## Notes:

*Read the entire detailed instructions before beginning work.*

*A larger amount of Wash Buffer may be prepared at once and stored at room temperature for later use.*

*Save the plate packaging or copy the diagram of the capture antibody array into your notebook. Data will be labeled according to the location of each spot, not the actual name of the coating.*



**Notes:**

Prepare dilutions of sAPP $\beta$  Calibrator:

1  $\mu\text{g/mL}$ : 6  $\mu\text{L}$  of the 50  $\mu\text{g/mL}$  solution plus 294  $\mu\text{L}$  of diluent  
 300 ng/mL: 100  $\mu\text{L}$  of the 1  $\mu\text{g/mL}$  solution plus 216  $\mu\text{L}$  diluent  
 100 ng/mL: 100  $\mu\text{L}$  of the 300 ng/mL solution plus 216  $\mu\text{L}$  diluent  
 30 ng/mL: 100  $\mu\text{L}$  of the 100 ng/mL solution plus 216  $\mu\text{L}$  diluent  
 10 ng/mL: 100  $\mu\text{L}$  of the 30 ng/mL solution plus 216  $\mu\text{L}$  diluent  
 3 ng/mL: 100  $\mu\text{L}$  of the 10 ng/mL solution plus 216  $\mu\text{L}$  diluent  
 1 ng/mL: 100  $\mu\text{L}$  of the 3 ng/mL solution plus 216  $\mu\text{L}$  diluent  
 300 pg/mL: 100  $\mu\text{L}$  of the 1 ng/mL solution plus 216  $\mu\text{L}$  diluent  
 100 pg/mL: 100  $\mu\text{L}$  of the 300 pg/mL solution plus 216  $\mu\text{L}$  diluent  
 30 pg/mL: 100  $\mu\text{L}$  of the 100 pg/mL solution plus 216  $\mu\text{L}$  diluent  
 10 pg/mL: 100  $\mu\text{L}$  of the 30 pg/mL solution plus 216  $\mu\text{L}$  diluent  
 0 pg/mL: diluent alone

The sAPP $\beta$  Calibrator can be diluted in a solution of 1% Blocker A in 1X Tris Wash Buffer. If the calibration curve will be used for quantification of proteins in a complex matrix (culture supernatant, serum, CSF, etc.) a different diluent may be desired.

The pH changes that occur in culture medium are detrimental to this assay, and it is recommended that culture medium samples be supplemented with HEPES buffer, pH 7.3 at a final concentration of 50 mM. Other matrices should be examined for pH effects, or also supplemented with HEPES buffer.

Wash plates four times with Tris Wash Buffer.

**STEP 2**

Dispense 25  $\mu\text{L}$ /well of Calibrators and samples.

Incubate with shaking at room temperature for 1 hour. Prepare Detection Antibody during this time.

This dilution scheme gives a "half-log" titration, in which data points will be evenly spaced when plotted on a log scale.

*Prepare Detection Antibody:*

- Dilute SULFO-TAG labeled Detection Antibody to a final concentration of 1 nM.
- Use cold Antibody Dilution Buffer. Sufficient antibody is supplied to prepare 3 mL per plate.

MSD recommends preparing the Calibrator dilutions in triplicate.

Wash plates four times with Tris Wash Buffer.

**STEP 3**

Add 25  $\mu\text{L}$ /well of Detection Antibody.

Incubate with shaking at room temperature for 1 hour. Prepare Read Buffer during this time.

*Dilute Read Buffer:*

- Approximately 20 mL/plate is required.
- Dilute 4X Read Buffer T (with surfactant) to 1X with deionized water.

Diluted Read Buffer can be kept in a tightly sealed container at room temperature for later use.

Wash plates four times with Tris Wash Buffer.

**STEP 4**

Add 150  $\mu\text{L}$ /well of diluted Read Buffer T.

**INCUBATE PLATE AT ROOM TEMPERATURE (NO SHAKING) FOR 10 MINUTES**

Note that bubbles in the Read Buffer will interfere with reliable imaging of the plate if carried into the wells.

Analyze with SECTOR<sup>®</sup> Imager.

The incubation in Read Buffer is essential for this assay.

The necessity of the incubation in Read Buffer may vary for different matrices.



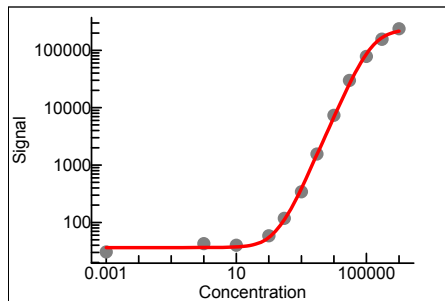
## sAPP Calibrator

### Recombinant Human sAPP $\beta$

<b>Contents:</b>	750 ng recombinant sAPP $\beta$ protein
<b>Concentration:</b>	50 $\mu$ g/mL
<b>Volume:</b>	15 $\mu$ L
<b>Preparation:</b>	Recombinant human sAPP $\beta$ protein was purified from overexpressing mammalian cells.
<b>Storage:</b>	Store at $\leq -70^{\circ}\text{C}$ .
<b>Quality Control:</b>	Recombinant protein has been analyzed by SDS-PAGE and MSD MULTI-SPOT Assays.

### MSD MULTI-SPOT Assay Results

Typical titration curve for recombinant sAPP $\beta$  using the MSD MULTI-SPOT sAPP $\beta$  assay.



conc	Ave	StdDev	%CV	P/N
0	31	15	49	
1 pg/ml	43	15	34	1
10 pg/ml	40	8	20	1
100 pg/ml	59	13	23	2
300 pg/ml	118	12	10	4
1 ng/ml	342	16	5	11
3 ng/ml	1553	72	5	51
10 ng/ml	7350	541	7	240
30 ng/ml	29802	2262	8	972
100 ng/ml	78230	4371	6	2551
300 ng/ml	155928	6771	4	5085
1 $\mu$ g/ml	237557	7991	3	7746

Detection limit (3 S.D. over background): 182 pg/ml

### SDS-PAGE

A 0.5 mg sample of each sAPP protein was run on a 4-12% Bis-Tris NuPAGE gel to demonstrate purity (>95%).

