

# Development of a Novel Highly Sensitive mBDNF ELISA

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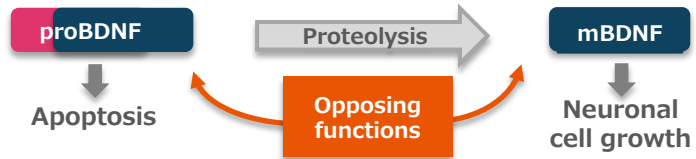


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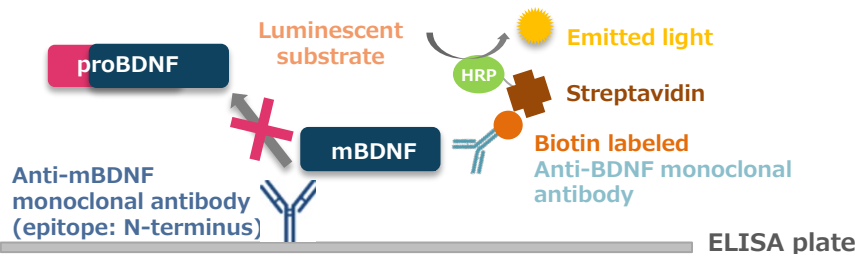
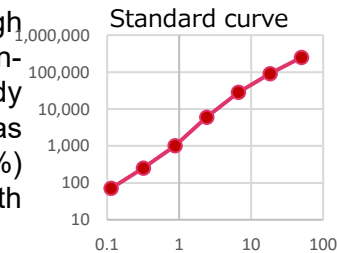
## I. INTRODUCTION

Brain-derived neurotrophic factor (BDNF) is a member of the NGF family of neurotrophic factors. BDNF is involved in neurogenesis and synaptogenesis and is expected to serve as a biomarker for diseases of the nervous system, such as depression, autism, and schizophrenia. BDNF has a precursor termed proBDNF, which is converted to mature BDNF (mBDNF) through protease's proteolytic removal of the N-terminal fragment. It's important to distinguish between mBDNF and proBDNF because proBDNF has different physiological functions (apoptosis and inhibition of neurite growth) from mBDNF.



## II. ASSAY PRINCIPLE

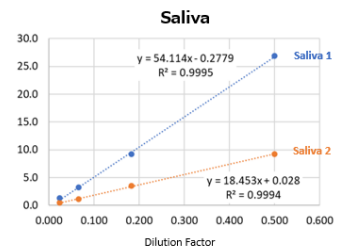
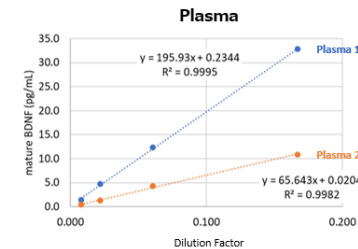
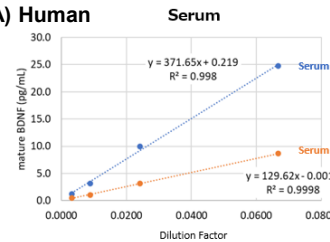
We constructed a sandwich ELISA with high sensitivity (**0.116 pg/mL**) using streptavidin-conjugated HRP, a biotin-labeled antibody and luminescent substrate. The ELISA has low cross-reactivity with proBDNF (1.30%) because a monoclonal antibody reacts with the N-terminal end of mBDNF.



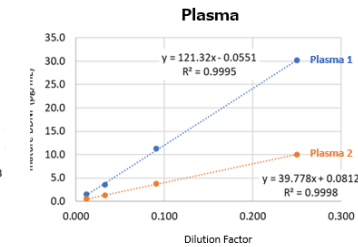
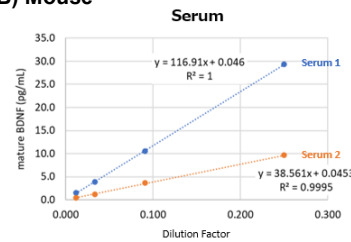
## III. RESULTS

### 1. Dilution linearity

#### A) Human



#### B) Mouse



The ELISA showed good dilution linearity using human serum, plasma, and saliva, and mouse serum and plasma with the mBDNF. The representative data are shown.

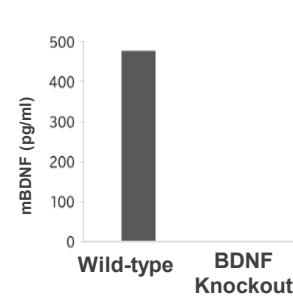
### 2. Specificity

Species	Proteins	Reactivity (%)
Human	proBDNF	1.30
	NGFβ	< 0.232
	NT-3	< 0.232
	NT-4	< 0.232
Mouse	proBDNF	0.328
	NGFβ	< 0.232
	NT-3	< 0.232
	NT-4	< 0.232

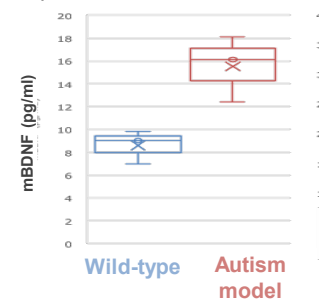
50 pg/mL of the proteins were measured by the ELISA. The ELISA showed low cross-reactivity with proBDNF and other NGF family proteins (NGF-β, NT-3, NT-4).

### 3. Quantitation of mBDNF in mouse models

#### A) WT vs BDNF KO



#### B) WT vs Autism model Mouse



A) Mouse plasma mBDNF levels were measured by the ELISA. B) Mouse plasma mBDNF levels were measured by High-sensitive ELISA, ver1. All samples showed measurable levels of mBDNF because of the high sensitivity. In addition, the mBDNF level in autism model mice tended to be higher than in wild-type mice. n=3

## IV. CONCLUSION AND DISCUSSION

- We have developed High-sensitive mature BDNF ELISA that can measure mature BDNF specifically.
- Our method is expected to be a valuable tool for various mature BDNF studies using various models from humans, mice, and rats.

Mature BDNF ELISA Kit



#290-85801 96 tests

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	Fujifilm	Comp A	Comp B	Comp C
<b>Sensitivity</b>	<b>0.116 pg/mL</b>	62.5 pg/mL	15.6 pg/mL	15.0 pg/mL
<b>Cross-reactivity with human proBDNF</b>	<b>1.30 %</b>	≈ 10 %	≈ 15 %	≈ 50 %