



# BDNF Levels Significantly Lower in Mothers of Autistic Individuals

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## Abstract

Brain Derived Neurotrophic Factor (BDNF) is a growth factor linked depression, schizophrenia and Alzheimer's disease. We used immune arrays to quantitate levels of BDNF in the plasma of mothers of autistic children and neurotypical controls. We found that BDNF levels significantly lower in mothers of autistic individuals compared to controls. This data suggests that mothers of individuals with autism have decreased BDNF levels which may be associated with the etiology of autism in their children.

**Keywords:** ASD, BDNF, Plasma, Psychiatric disorders

## Introduction

Autism Spectrum Disorders (ASD) are characterized by symptoms of dysfunctional social interactivity, communication, and many stereotyped behaviors<sup>1</sup> and diagnosis is based solely on behavioral criteria. Brain Derived Neurotrophic Factor (BDNF) is a member of the neurotrophin family of growth factors, which are related to the canonical nerve growth factor. Neurotrophic factors are found in the brain and the periphery. Various studies have shown possible links between BDNF and conditions, such as depression<sup>2</sup> schizophrenia<sup>3</sup> Alzheimer's disease<sup>4</sup> Huntington's disease<sup>5,6</sup> Rett syndrome<sup>7</sup> and dementia.<sup>8</sup> Abnormal expression of BDNF is associated with neurologic and psychiatric disorders, including Fragile X syndrome, epilepsy, Parkinson's disease, Alzheimer's disease, schizophrenia and depression.<sup>9-11</sup> We used immune-arrays to quantitate levels of BDNF in the plasma of mothers of autistic children and neurotypical controls.

## Methods

### Subjects

Plasma BDNF was measured in 15 mothers of autistic children and 12 age and gender similar neurotypical controls. Subject plasmas were obtained from the Autism Genetic Resource Exchange (AGRE)\*\*. This study was approved by the IRB of the Health Research Institute.

### Plasma

All plasma was received frozen and immediately placed at -70C before Immunoassay analysis.

### Immuno-array assays

Immuno-array assays, as previously described,<sup>12</sup> were performed by Ray Biotech, Inc, Peachtree Corners, GA. 30092.

Quick Response Code:



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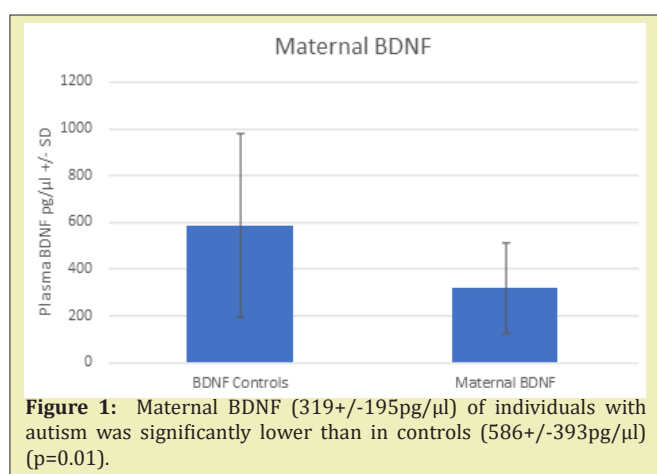
## Statistics

Statistical analysis was done using T-tests with 95% confidence levels.

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## Results

We found that BDNF levels significantly lower in mothers of autistic individuals compared to controls Figure 1.



## Discussion

A meta-analysis of blood BDNF in 887 patients with ASD and 901 control subjects demonstrated significantly higher BDNF levels in ASD compared to controls,<sup>12</sup> and another meta-analysis included 19 studies with 2896 unique participants. Random-effects meta-analysis of all 19 studies showed that children with ASD had significantly increased peripheral blood levels of BDNF compared with healthy controls.<sup>13</sup> These observed relationships are most likely the result of impact of pathogenesis rather than inheritance because elevated BDNF was not associated with BDNF genepolymorphism.<sup>14</sup> Our results indicate that mothers of autistic individuals have decreased BDNF and suggests a metabolic over-compensation effect leading to her autistic child's higher BDNF production.

## Conclusion

This data suggests that mothers of individuals with autism have decreased BDNF levels. This may be associated with the etiology of autism in their children.

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None.

## Conflicts of Interest

Author declares that there is no conflict of interest.

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