

# Corpus Callosum Morphology in Twin Pairs Discordant for Bipolar Disorder

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## Introduction:

Previous studies have observed callosal volume reduction in patients with bipolar disorder, but it is not yet known whether these deficits reflect genetic vulnerability to the illness. In this study we used computational methods to map corpus callosum (CC) thickness and curvature in a population-based sample of twin pairs discordant for bipolar disorder.

## Methods:

Twenty-one probands with bipolar I disorder (mean age 44.4+/-7.5 years; 48% female), 19 of their non-bipolar co-twins, and 34 demographically matched control twin individuals underwent magnetic resonance imaging (MRI). Three-dimensional callosal surface models were created to visualize its morphologic variability and to localize group differences. Neurocognitive correlates of callosal area differences were additionally investigated in the bipolar probands and their co-twins.

## Results:

Bipolar I probands, but not their co-twins, showed significant callosal thinning and area reduction, most pronounced in the genu and splenium, relative to healthy co-twins. Altered callosal curvature was additionally observed in BPI probands. In bipolar probands and their co-twins, genu and splenium midsagittal areas were significantly correlated with verbal processing speed and response inhibition.

## Conclusions:

These findings suggest that aberrant connections between cortical regions may be involved in bipolar pathophysiology.

These abnormalities may reflect decreased myelination of white matter tracts- However, findings of callosal thinning appear to be disease-related, rather than reflecting familial, probably genetic, vulnerability to bipolar illness.

## **Disorders of the Nervous System**

Mood and Anxiety Disorders

### **Abstract Information**

### **References**

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Luders E, Narr KL, Bilder RM, Thompson PM, Szeszko PR, Hamilton L, Toga AW. (2007). Positive correlations between corpus callosum thickness and intelligence. *Neuroimage* 37: 1457-1464.