

# FOCUS ON RESEARCH

## WHITE MATTER INTEGRITY IN BIPOLAR DISORDER AND SCHIZOPHRENIA.

### Researchers

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### Aim

To evaluate 1) whether the connections between specific brain regions are disrupted in people with major mental illness, 2) whether they differ in patients with bipolar disorder as opposed to schizophrenia, 3) whether they are related to 'genes for mental illnesses'

### Project Outline/Methodology

Patients with schizophrenia have abnormalities of the parts of their brain that carries electrical connections between different regions. We used an advanced technique, called Diffusion Tensor Imaging, to examine these connections in 42 people with a diagnosis of bipolar disorder, 28 with schizophrenia and compared them to 38 people with no previous mental health difficulties. Any deficits were then examined to see if they were related to a specific risk gene for psychosis called Neuregulin 1.

### Key Results

People with a history of serious mental health problems showed significant abnormalities in their brain connections compared to people with no mental health problems. These abnormalities were widespread, but tended to focus on areas that connected the very front of the brain to the rest of the brain. The deficits appeared to be partly related to a gene, called neuregulin 1, which has previously been found to be associated with liability to major mental illnesses.

### Conclusions

Common abnormalities of white matter can be found in both bipolar disorder and in schizophrenia. These abnormalities are not clearly related to any specific symptom or to medication. Neuregulin, a gene associated with increased risk for psychosis, was associated with white matter density in this sample.

### What does this study add to the field?

This is the first study comparing white matter integrity in both schizophrenia and bipolar disorder.

It is the first study to examine the structural associations of neuregulin 1.

### Implications for Practice or Policy

This study suggests that white matter abnormalities are linked to the cause of serious mental illness. These problems may help us understand how some people are susceptible to mental illness from a very early age and develop new ways of reducing that vulnerability.

### Where to next?

It is not known if the white matter abnormalities found in people with major mental illness are present in their unaffected relatives, or if their presence could be used to predict illness years later. This possibility could be investigated by studying people at increased risk of bipolar disorder using similar techniques over a number of years.

### Further details from:

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