



**American College of Neuropsychopharmacology**

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## **STUDY FINDS BRAIN DIFFERENCES IN ADOLESCENTS WITH MENTAL ILLNESS**

*Findings show gender-related brain differences in early onset  
schizophrenia, bipolar disorder*

**Boca Raton, FL, December 8, 2007** – Puberty may have an impact on areas of the brain that contribute to bipolar disorder or schizophrenia in youth, according to a study presented today at the annual meeting of the American College of Neuropsychopharmacology (ACNP).

Researchers studying the brains of youth with bipolar disorder (also known as manic depressive illness) and schizophrenia found that these children have size differences in some brain areas between these disorders and between genders. These changes exist in key areas of the brain that are involved in reward, motivation, sensory input, emotion and memory, and researchers say examining these areas can help researchers understand developmental processes that occur around the time mental disorders develop.

The brains of children with bipolar disorder are different from the brains of children with schizophrenia, and there are brain differences between boys and girls, and investigators say such findings can help them better understand gender's role in brain processes, and how it affects the development of mental illness. Additionally, they could help lay the foundation for identifying different possible treatment approaches to these illnesses in boys and girls.

“To our knowledge, our study is the first to determine if specific areas of the brain differ according to sex and adolescent development, compared to children without these disorders,” says Jean A. Frazier, M.D., Director of the Child and Adolescent Neuropsychiatric Research Program at Cambridge Health Alliance, Harvard Medical School, in Massachusetts and an ACNP member.

Frazier and fellow researchers examined 103 brain scans of children and adolescents with bipolar disorder or schizophrenia and found that the nucleus accumbens (a brain structure that is involved in motivation and pleasure) was larger in bipolar disorder. They

also found that the thalamus (the part of the brain through which sensory information passes to the cerebral cortex) was smaller in children with schizophrenia.

Frazier's work suggests that as the brain develops, some brain structures may be more vulnerable to mental illness than others in children with these illnesses, particularly during pubertal development. These developmental brain changes may be biomarkers – specific traits – that make the brain more vulnerable to these mental illnesses.

Finally, when Frazier looked at the entire bipolar group compared to healthy children, the hippocampus (the part of the brain which plays a central role in memory) was smaller in youth with bipolar disorder after puberty, particularly in girls. Younger (pre-pubescent) children did not show this difference. These findings suggest that sex hormones may influence how the brains of these vulnerable children develop and that the onset of puberty may be associated with the abnormal brain development seen in these children.

“Future studies need to look at sex differences over time in order to understand more about these mental disorders and the information gleaned from these studies may help researchers determine how to best help children who suffer from these conditions,” Frazier says. “This may allow us to find improved treatment, perhaps in a sex-specific way.

The findings add to the evidence that adolescence is a critical period of vulnerability for the development of schizophrenia and bipolar disorder. The onset initiates a set of sex-specific brain developmental processes that may have an important role in the emergence of these disorders.

*ACNP, founded in 1961, is a professional organization of more than 700 leading scientists, including four Nobel Laureates. The mission of ACNP is to further research and education in neuropsychopharmacology and related fields in the following ways: promoting the interaction of a broad range of scientific disciplines of brain and behavior in order to advance the understanding of prevention and treatment of disease of the nervous system including psychiatric, neurological, behavioral and addictive disorders; encouraging scientists to enter research careers in fields related to these disorders and their treatment; and ensuring the dissemination of relevant scientific advances.*

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