Docket #: S05-195

Genes and Pathways Differentially Expressed in Bipolar Disorder and/or Major Depressive Disorder

This invention is from the Pritzker Neuropsychiatric Disorders Research Consortium, a collaborative research enterprise comprised of several leading academic institutions and based on a long-term relationship between the Pritzker family and scientists at the various institutions. Groups at UC Davis, UC Irvine, Stanford University, University of Michigan and Cornell conduct studies on human post-mortem tissue, isolated populations and various animal models to identify altered profiles of gene expression in brain circuits associated with neuropsychiatric disorders.

Clinical depression, including both bipolar disorders and major depression disorders, is a major public health problem, affecting an estimated 9.5% of the adult population of the United States each year. While it has been hypothesized that mental illness, including mood disorders such as major depression ("MDD") and bipolar disorder ("BP") as well as psychotic disorders such as schizophrenia, may have genetic roots, little progress has been made in identifying gene sequences and gene products that play a role in causing these disorders, as is true for many diseases with a complex genetic origin.

The current lack of biomarkers and the ineffectiveness and reliability of the diagnosis and rates are important issues for the treatment of mental disorders. For example, around 15% of the population suffers from MDD while approximately 1% suffers from BP disorders. Diagnosing bipolar disorder is difficult when, as sometimes occurs, the patient presents only symptoms of depression to the clinician. At least 10-15% of BP patients are reported to be misdiagnosed as MDD. The consequences of such misdiagnosis include a delay in being introduced to efficacious treatment with mood stabilizers and a delay in seeking or obtaining

counseling specific to bipolar disorder. Also, treatment with antidepressants alone induces rapid cycling, switching to manic or mixed state, and consequently increases suicide risk.

The inventors of the present application have used DNA microarrays to study expression profiles of human post-mortem brains from patients diagnosed with BP or MDD. One aspect of the technology demonstrates differential expression of the FGF pathway in the frontal cortex of MDD subjects. Particular, through a separate analysis of specific serotonin reuptake inhibitor (SSRI)-treated and non-SSRI-treated MDD subjects that the observed changes in expression of FGF transcripts are not secondary to drug treatment. Rather, changes in specific FGF transcripts are attenuated by SSRIs and may thus be partially responsible for the mechanism of action of these drugs.The FGF-related genes could be used as a component of a diagnostic for BP or MDD.

Applications

- Diagnose and guide treatment of major depression and bipolar disorder.
- Identify compounds which are effective in treating major depression and/or bipolar disorder.

Advantages

- Use of gene expression in different brain regions to diagnose, and direct treatment of mental illness.
- Can be detected with PCR, microarrays, or in situ hybridization.
- Can track disease progression.

Publications

- U.S. patent application published as 2006-0051786 on March 9, 2006.

Patents

- Published Application: 20060051786

- Published Application: 20170211144

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