

Two Gene Co-expression Modules Differentiate Psychotics and Controls

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Abstract:

Schizophrenia and bipolar disorder are highly heritable psychiatric disorders. Associated genetic and gene expression changes have been identified, but many have not been replicated and have unknown functions. We identified groups of genes whose expressions varied together, i.e. co-expression modules, then tested them for association with schizophrenia. Using Weighted Gene Co-expression Network Analysis, we show that two modules were differentially expressed in patients versus controls. One, up-regulated in cerebral cortex, was enriched with neuron differentiation and neuron development genes, as well as disease GWAS genetic signals; the second, altered in cerebral cortex and cerebellum, was enriched with genes involved in neuron protection functions. The findings were preserved in five expression data sets, including sets from three brain regions, from a different microarray platform, and from bipolar disorder patients. From those observations, we propose neuron differentiation and development pathways may be involved in etiologies of both schizophrenia and bipolar disorder, and neuron protection function participates in pathological process of the diseases.

Keywords:

Gene Expression, Schizophrenia, WGCNA, Neuron differentiation, Neuron protection