Extending the Investigation of GRIN2B, a Prioritized Gene for Predisposition to Bipolar Disorder, using NCIBI Tools

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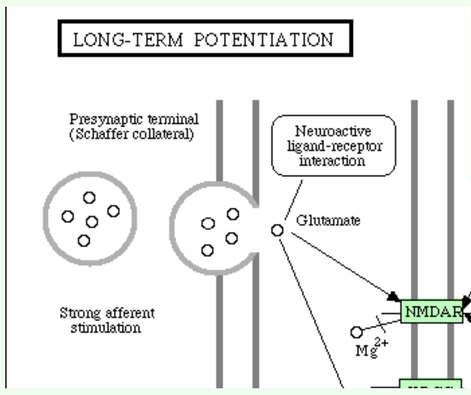
INTRODUCTION:

- We had observed from a microarray study on the changes in gene expression in HepG2 cell line exposed to low levels of mercury that the Affymetrix probe set 213764_s_at mapped to chromosome 12p13.1-p12.3 was upregulated (PMID: 16823088).
- The protein-encoding gene Glutamate Receptor, Ionotropic, N-methyl D-aspartate (NMDA) 2B (GRIN2B) is also located on human chromosomal region 12p and has been prioritized in population-based studies as a candidate gene for predisposition to bipolar disorder (PMID: 16380905, 18007143).



- The NMDA receptor activation leads to a calcium influx into the post-synaptic cells, a signal thought to be crucial for the induction of NMDA-receptor dependent Long Term Potentiation (LTP) and Long Term Depression (LTD).
- Thus over-expression of these receptors can account for “excitotocity” of manic phases of bipolar diseases typical of Type I Bipolar Disorder.

OBJECTIVES OF STUDY:

- Determine Medical Subject Heading (MeSH) qualifiers and protein interactions associated with GRIN2B.

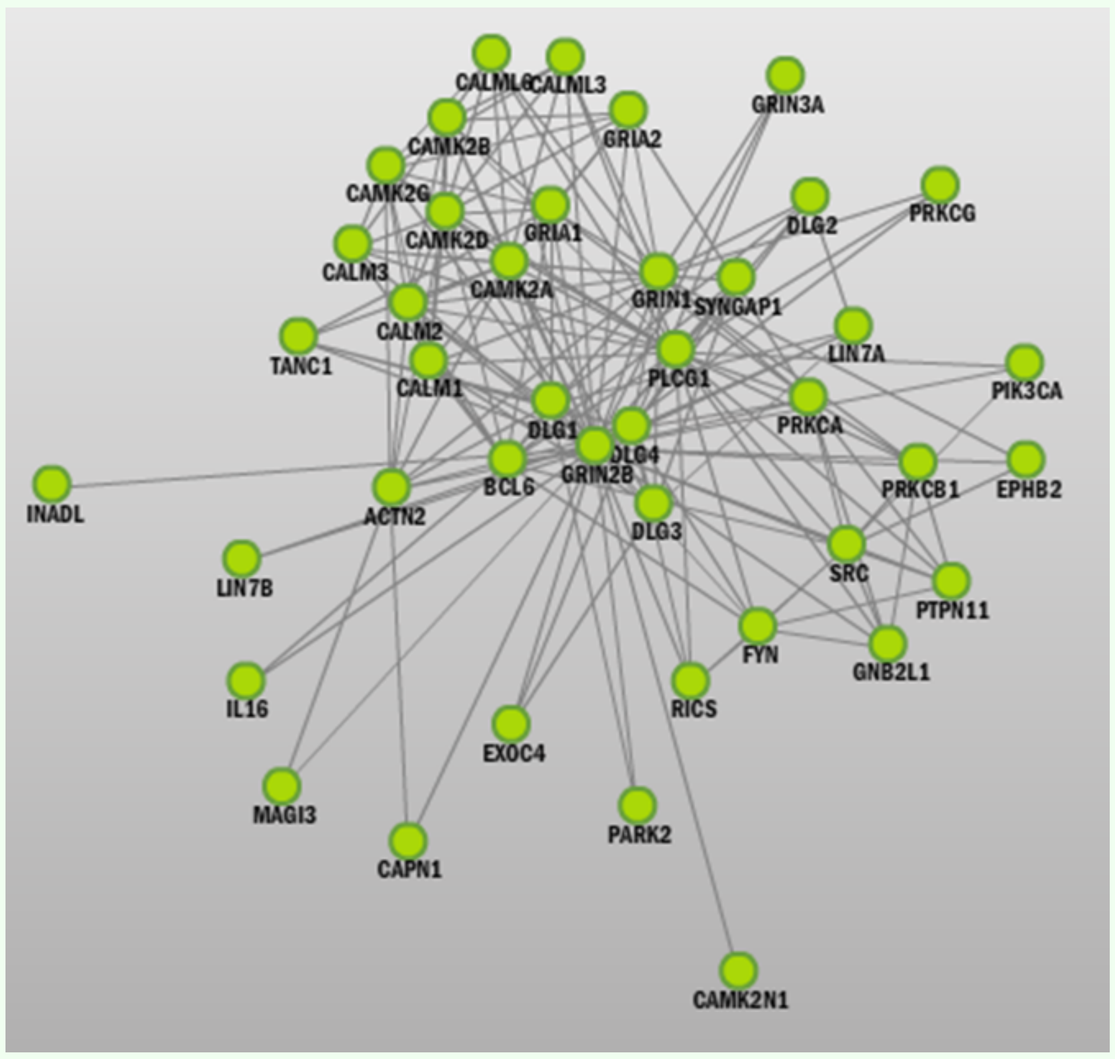
METHODS:

- The NCIBI Gene2Mesh Tool (http://gene2mesh.ncibi.org) to determine MeSH terms significantly associated in PubMed abstracts.

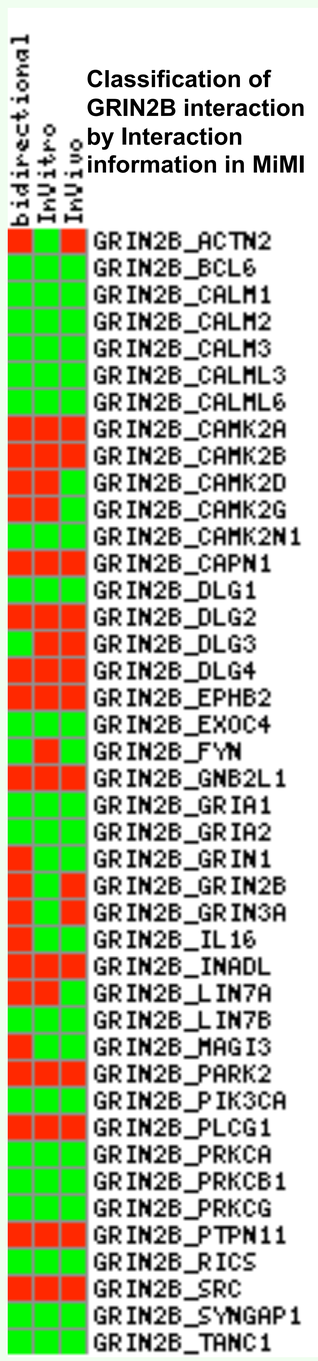
- The NCIBI NetBrowser Tool was used to visualize the interactions of proteins with GRIN2B available from the Michigan Molecular Interactions (MiMI).

RESULTS:

- A total of 49 significant MeSH headings were found matching the human gene symbol "GRIN2B". The associated MeSH Qualifiers were etiology, cytology, genetics, metabolism, pharmacology and physiology. Furthermore, the Gene2Mesh analysis revealed Alcoholism and Ethanol as significant MeSH Headings.
- Forty-two protein interactions were stored in MiMI for GRIN2B and we classified them based on the type of interaction information (bidirectional, in vitro and in vivo).



Netbrowser visualization of interactions of GRIN2B with other proteins



- Twelve interactions with GRIN2B had annotation for the three interaction descriptors.

CONCLUSION:

- We have used NCIBI tools to extend our investigation on GRIN2B for understanding genetic predisposition to comorbid bipolar disorder and substance abuse.

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