

## Publication

### Association of polymorphisms in P2RX7 and CaMKKb with anxiety disorders

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**Background:** There is considerable evidence that genetic factors play an important role in the pathophysiology of affective disorders including bipolar disorder, major depressive disorder and anxiety disorders. Long-term follow up studies as well as drug treatment studies suggest that these clinical conditions share a number of pathophysiological commonalities including genetic variables. One possible candidate region is located on chromosome 12q24.31, originated from previous linkage and association studies with bipolar disorder and unipolar depression. This region contains two candidate genes for purinergic ligand-gated ion channels, P2RX7 and P2RX4, and one gene coding for calmodulin-dependent protein kinase kinase b (CaMKKb).

**Methods:** In the present study, we investigated the genetic associations between 15 SNPs in the candidate genes P2RX7, P2RX4 and CaMKKb on chromosome 12q24.31 in 179 patients with anxiety disorders and syndromal panic attacks versus 462 healthy controls.

**Results:** One nominal case-control association could be detected for a SNP in the 5'UTR region of P2RX4, which did not remain significant after correction for multiple testing. We found, however, a prominent association between severity of panic- and agoraphobia symptoms and an exonic SNP (rs3817190) in the CaMKKb gene and a trend for association with an exonic SNP in P2RX7 (rs1718119) with severity scores in the panic- and agoraphobia scale.

**Conclusion:** The locus 12q24.31 seems to be an important genetic region for anxiety, bipolar and unipolar disorders, suggesting a genetic overlap in the group of affective disorders. The specific contribution of the herein reported gene polymorphisms to the clinical condition is still unclear and warrants further analysis. (c) 2006 Elsevier B.V. All rights reserved.

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