



## Novel biomarkers in neurological and psychiatric disorders: autoantibodies to neuronal nicotinic acetylcholine receptors (NicAb)

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Nicotinic acetylcholine receptors (nAChRs) are pentameric subunit complexes of two major subtypes, muscle and neuronal, which mediate neurotransmission for muscle contraction or regulate neuronal excitability and neurotransmitter release in the CNS, respectively. Neuronal nAChRs are drug targets for neuropsychiatric diseases. Neuronal nAChR reduced expression and/or impairment may be involved in neuropsychiatric diseases including Alzheimer's, Parkinson's, autism, schizophrenia, affective disorders and drug addiction. Antibodies (Abs) against nAChRs could cause nAChR loss and dysfunction, likely resulting in serious diseases. Abs to muscle nAChRs cause myasthenia gravis while Abs to neuronal nAChRs have been reported in patients with schizophrenia, bipolar disorder and autoimmune dysautonomia. However, systematic state-of-the-art studies with cell based assays are still lacking. We aim to develop immunoassays (Athens) to detect new Abs to neuronal nAChRs in patients with neurological (Milan) and psychiatric (Magdeburg) diseases of suspected autoimmune etiology. Two large biobanks of sera/CSF from patients with well-characterized neuroimmunological disorders (autoimmune encephalitis and related disorders, myasthenia gravis), and schizophrenia, major depression and bipolar disorder, will be tested. Study of Ab binding and function and their correlation with particular symptoms will lead to new biomarker tests for disease diagnosis, monitoring and therapy selection.