

Alteration of the protein levels and/or posttranslational modification of CRMP 2 (Collapsin Response Mediator Protein 2) in the peripheral blood samples from young schizophrenia patients

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Schizophrenia is a disorder that is characterized by disturbances in thinking, perception, emotions and behavior. However, there are currently no validated biomarkers for schizophrenia. CRMP2 (collapsin response mediator protein 2) is an intracellular protein that plays an important role in mediating axon guidance molecules, dendritic branching and spine formation through its phosphorylation at the serine 522 residue. Accumulating evidence suggests that CRMP2 is implicated in neuropsychiatric disorders. We examined protein levels in brain specimens of Schizophrenia and control patients. Increased levels of total CRMP2 were found. In many cases this increased CRMP2 lowered the p-CRMP2:total CRMP2 ratio. To determine whether or not CRMP2 is a potential biomarker, we established an in vitro assay system, which allows us to evaluate the amount of CRMP2 and its phosphorylated CRMP2 in human peripheral blood mononuclear lymphocytes. The absolute value of CRMP2 of schizophrenic patients was higher than that of healthy control subjects under the age of 30 years. The relative amount of phosphorylated form of CRMP2 (pS522-CRMP2) to total CRMP2 (pS522-CRMP2/CRMP2) was low in the young schizophrenia group than the age-matched control young group. These results suggest some alteration of the protein levels and/or posttranslational modification of CRMP2 from schizophrenia patients, providing CRMP2 as a potential biomarker for schizophrenia.