# Interactions between dopamine transporter and N-methyl-D-aspartate receptor-related amino acids in cognitive impairments in schizophrenia

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**Background**
Dysfunctions of the dopamine system and N-methyl-D-aspartate receptor (NMDAR) were the main hypotheses of the pathophysiology of schizophrenia. However, only a few studies evaluated the interactions between these two systems.

**Aims & Objectives**
This study explored the roles of striatal dopamine transporter (DAT) and plasma NMDAR related amino acids concurrently on cognitive impairments in schizophrenia.

**Methods**
We recruited 36 schizophrenia patients and 36 age- and sex-matched healthy controls (HC). All participants underwent cognitive assessments of attention, memory, and executive function. Single-photon emission computed tomography with 99mTc-TRODAT and ultra-performance liquid chromatography were used to determine DAT availability and plasma concentrations of eight amino acids, respectively.

**Results**
Compared with HC, schizophrenia patients had lower cognitive performance, higher methionine concentrations, decreased concentrations of glutamic acid, cysteine, aspartic acid, arginine, the ratio of glutamic acid to gamma-aminobutyric acid (Glu/GABA), and DAT availability in the left caudate nucleus (CN) and putamen. In all participants, the memory scores were positively related to Glu/GABA and the DAT availability in left CN and putamen and negatively associated with methionine concentrations. The DAT availability in left CN mediated the methionine-memory relationship. The backward stepwise regression analysis for the four biological makers related to memory indicated that DAT availability in left CN and Glu/GABA positively associated with memory scores in the final model.

**Discussion & Conclusion**
This study demonstrated the interactions of striatal DAT and NMDAR related amino acids in the cognitive impairments in schizophrenia. Future studies to comprehensively evaluate their complex interactions and treatment implications are warranted.