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# Are D-neurons and trace amine-associated receptor, Type 1 involved in mesolimbic dopamine hyperactivity of schizophrenia?

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## Abstract

Although dopamine (DA) dysfunction is a well-known hypothesis for etiology of schizophrenia, molecular basis of mesolimbic DA hyperactivity has not yet been clarified. To explain this, modulating function of trace amines on DA neurotransmission and the decreased number of striatal D-neurons, trace amine-producing neurons, were considered. Notably, Trace Amine-Associated Receptor, Type 1 (TAAR1), a subtype of trace amine receptors, has a large number of ligands, including tyramine, β-phenylethylamine and methamphetamine that influence on human mental state, and is now regarded as a target receptor for novel neuroleptics. Reduced stimulation of TAAR1 on DA neurons in the midbrain ventral tegmental area (VTA) has been revealed to increase firing frequency of VTA DA neurons. The author and her colleagues reported the decrease of D-neurons in the striatum and nucleus accumbens of postmortem brains of patients with schizophrenia. This may imply the decrease of trace amine synthesis and consequent reduction of the stimulation of TAAR1 on terminals of midbrain VTA DA neurons, and may lead to mesolimbic DA hyperactivity in schizophrenia. The decrease of striatal D-neurons of postmortem brains of schizophrenia might be due to neural stem cell dysfunction in the subventricular zone of lateral ventricle. The new “D-cell hypothesis”, in which D-neurons and TAAR1 are involved, may explain mesolimbic DA hyperactivity of schizophrenia.

## Biography

Keiko Ikemoto MD, PhD graduated Shiga University of Medical Science in 1985, and specialized Psychiatry and Neuroscience in the graduate school. She studied monoamine neuronal system and sleep as a Boursiere du Gouvernement Francais in the Department of Experimental Medicine, Claude Bernard University (Prof. Michel Jouvet), in France. She is Chief Director of the Department of Psychiatry, Iwaki Kyoritsu General Hospital, in Japan, senior researcher in Fukushima Medical University School of Medicine in Japan. She has published more than 60 papers in the field for neuropsychiatry and neuroscience.