

## Neuroreceptor imaging in psychiatric disorders

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Molecular imaging, the study of receptors, transporters and enzymes, as well as other cellular processes, has grown in recent years to be one of the most active neuroimaging areas. The application of single photon emission tomography (SPECT) and positron emission tomography (PET) techniques to the study of psychiatric illness has lead to increased understanding of disease processes as well as validated, *in vivo*, theories of illness etiology. Within the field of psychiatry these techniques have been applied most widely to the study of schizophrenia. Studies within schizophrenia are largely limited to either the dopamine or serotonin system. This is due in large part to the availability of suitable radiotracers as well as the current theories on the etiology of the illness. Two basic study designs are used when studying schizophrenia using molecular imaging and make up the majority of studies reviewed in this manuscript. The first type, termed “clinical studies,” compares the findings from PET and SPECT studies in those with schizophrenia to normal controls in an attempt to understand the pathophysiology of the illness. The second study design, termed “occupancy studies,” uses these techniques to enhance the understanding of the mechanism of action of the medications used in treating this illness. This review will focus on the findings of molecular imaging studies in schizophrenia, focusing, for the most part, on the serotonin and dopamine systems. Emphasis will be placed on how these findings and techniques are currently being used to inform the development of novel treatments for schizophrenia.

**Key words:** PET, SPECT, schizophrenia, dopamine, serotonin