Abstract

Since clinical symptoms of Parkinson’s disease (PD) do not appear until a significant number of dopaminergic neurons are lost, it is often diagnosed only when the disease has progressed to an advanced stage. It can be diagnosed at an early stage even before clinical symptoms appear if the status of dopamine neurotransmission could be evaluated in susceptible individuals. This evaluation is now possible using a novel molecular imaging technique we recently developed. The technique called the single-scan dynamic molecular imaging technique (SDMIT) or neurotransmitter imaging technique allows detection, mapping and measurement of dopamine released in the live human brain during cognitive, emotional or behavioral challenge. Since the technique allows detection of dysregulated dopamine neurotransmission during a challenge, it could help diagnose PD at preclinical stage. This technique can also be used to study the nature of dysregulated dopamine neurotransmission in PD during processing of motor as well as cognitive, emotional and behavioral functions that are impaired in this condition.