Non-Invasive And Non-Radioactive Method For Dopaminergic Mapping Of Normal And Disordered Brain Tissues With Standard MRI

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Technology description

Summary
UCLA researchers at the Semel Institute for Neuroscience & Human Behavior have developed novel method that allows visualization of the brain dopamine receptor density on standard MRI using magnetonanoparticles conjugated to hydroxyl fallypride.

Background
The interaction between neurotransmitter dopamine and the dopamine receptor is essential in many neurological processes, including cognition, memory, learning, fine motor control, and modulation of neuroendocrine signaling. Abnormal dopamine receptor signaling and dopaminergic nerve function is implicated in several neuropsychiatric disorders. Thus, dopamine receptors are the primary targets in the medical treatment of schizophrenia, Parkinson’s disease, and Huntington’s disease.

Innovation
Researchers at UCLA have developed magnetonanoparticle conjugated hydroxyl fallypride to be used in dopaminergic mapping of the brain using MRI. The modified fallypride is a high affinity dopamine D2/D3 receptor antagonist, and allows non-invasive determination of brain dopaminergic function for accurate and quantitative determination of brain changes due to a variety of conditions and disorders, substance abuse and addiction, as well as quantitatively identification of the at-risk population. Additionally, this method may be used to elucidate the effect of deep brain stimulation implants in diseases such as Parkinson’s, Alzheimer’s, and other affective disorders such as depression.

Application area

- Brain dopaminergic mapping using standard MRI

Advantages

- Non-invasive
- Accurate and quantitative determination of dopamine receptor density change in the brain

Institution

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