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The Neural Circuitry of Restricted Repetitive Behavior: Magnetic Resonance Imaging in Neurodevelopmental Disorders and Animal Models

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Highlights

- Mapping the neural circuitry of RRB is in its early stages
- MRI provides needed translational studies of the network connectivity mediating RRB
- MRI findings implicate cortico-basal ganglia and cerebellar circuits in RRB
- MRI studies of animal models of RRB are lacking and sorely needed
- Advanced MRI with *in vitro* neuroscience methods are needed to confirm RRB circuitry

Abstract

Restricted, repetitive behaviors (RRBs) are patterns of behavior that exhibit little variation in form and have no obvious function. RRBs although transdiagonstic are a particularly prominent feature of certain neurodevelopmental disorders, yet relatively little is known about the neural circuitry of RRBs. Past work in this area has focused on isolated brain regions and neurotransmitter systems, but implementing a neural circuit approach has the potential to greatly improve understanding of RRBs. Magnetic resonance imaging (MRI) is well-suited to studying the structural and functional connectivity of the nervous system, and is a highly translational research tool. In this review, we synthesize MRI research from both neurodevelopmental disorders and relevant animal models that informs the neural circuitry of RRB. Together, these studies implicate distributed neural circuits between the cortex, basal ganglia, and cerebellum. Despite progress in