

Deanna Greene, Ph.D., Washington University School of Medicine



DETECTING FUNCTIONAL BRAIN CONNECTIVITY DIFFERENCES IN TOURETTE SYNDROME

Tourette syndrome (TS) is a developmental neuropsychiatric disorder characterized by motor and vocal tics. Previous research has demonstrated atypical white matter structure in the corpus callosum and atypical functional connectivity in cortical networks in TS. Here, we applied a multivariate analysis method – support vector machine (SVM) classification – to investigate whole-brain functional network connectivity in children with TS. Resting state functional connectivity (RSFC) MRI data from 42 children with TS (8-15yrs) and 42 unaffected controls (age, IQ, in-scanner movement matched) were included. While univariate tests identified no significant group differences, SVM classified group membership with ~70% accuracy using 264 regions of interest covering the whole brain. Additional targeted SVM analyses revealed strong contributions from somatomotor and control networks in distinguishing TS from controls. Further, when only inter-hemispheric connections were included in the analysis, classification accuracy increased to ~80%. These results suggest atypical functional connectivity patterns, particularly with inter-hemispheric connections, in TS.