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Relating Social Interaction to Neuropathology in a Mouse Model of Autism

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Autism spectrum disorders (ASD) vary in their presentation and severity of symptoms; however, they are all characterized by abnormal social interaction. Currently there is no defining neuropathology for these disorders, but studies have implicated the corpus callosum and cerebellum. Our laboratory studies the BTBR T+ tf/J (BTBR) mouse as a model of ASD. We measure the interactive behavior of mice through a social approach assay that confines the initiation of social interaction to one mouse of a pair, thereby determining the level of sociability in a single mouse. We generated mice that exhibited a range of social behavior by crossing the minimally social BTBR strain with the highly social FVB/NJ strain, and analyzed the F2 generation. Behavioral tests revealed that sociability levels of the F2 mice were grouped around the average score of the two parental strains. These results deviated from a Mendelian pattern, which suggests that the behavior is controlled by more than one gene. Additionally, midline area of the corpus callosum correlated with social interaction levels. Currently we are analyzing cerebellar and other brain abnormalities and their relationship to social interaction in BTBR mice.