# The Expression of Genes Correlated with ADHD and Dyslexia on the Vocal and Auditory Pathways of a Zebra Finch Model

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This study investigated expression of genes correlated with Attention Deficit Hyperactivity Disorder (ADHD) and dyslexia on the vocal and auditory pathways of a zebra finch, a model for understanding the neurobiology of human speech. The genes, COMT, SNAP25, GNB5, CDH13, DCDC2, and KIAA0319, were selected based on expressed sequence tags and correlations with ADHD or dyslexia. It was hypothesized that these genes would produce signaling in the zebra finch vocal learning nuclei. To visualize gene expression, an in situ hybridization protocol was used with a corresponding RNA probe to detect mRNA within zebra finch brain tissue sections. Results demonstrated expression of the candidate genes within zebra finch song and auditory nuclei suggesting that these genes impact the neural regulation of bird song, indicating that these genes are likely involved in the learning, plasticity, production, and maintenance of human speech. It is proposed that ADHD and dyslexia should no longer be considered stand alone diagnoses and should, at the very minimum, include speech and auditory processing testing. Future studies should re-evaluate how these disorders are classified and if more comprehensive diagnostic tools can be developed to better assess the full spectrum of these disorders.

**Awards Won:**