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### The DNA methylation landscape of developmental language disorder

Developmental language disorder (DLD), a common language disorder, is a neurodevelopmental condition. DNA methylation has a pivotal role during neurodevelopment, regulating transcriptional plasticity in the developing brain. Alterations in DNA methylation could provide cues to the pathogenesis of neurodevelopmental disorders. In this study, we examined any differential DNA methylation of genes in individuals with DLD compared with healthy controls. Twelve individuals with DLD and 12 age- and gender-matched healthy controls were recruited for the study. Infinium Methylation EPIC BeadChip was used to examine genome-wide methylation. The differentially methylated genes were found to be enriched in biological processes such as, WNT signaling (APCDD1, AMOTL1, LRP5, TMEM64, BANK1, VEPH1, WNT2B, TRABD2B, MARK2), G protein coupled receptor (GPCR) signaling (GNB5, GNG5, GNG7, NGEF, VAV2, VAV3) and Notch signaling (FCER2, JAG1, MIB1, NOTCH4, POFUT1, DTX1). WNT signaling is fundamental for several neurodevelopmental and post-neurodevelopmental processes, such as central nervous system regionalization, neural progenitor differentiation, axon guidance, [synaptogenesis](#), and neural plasticity. The GPCRs are involved in several physiological functions including vision, taste, olfaction, and sympathetic and parasympathetic nervous functions. They are abundantly expressed in the brain, and known to regulate cognition, mood, appetite and pain. The Notch signaling pathway is involved in a wide range of developmental processes including hematopoiesis and neurogenesis, and has been implicated in early neurodevelopment, learning, and memory. Alterations in these signaling pathways have been reported in other neurodevelopmental disorders (e.g., autism). This is the first study that indicates the impairment of these signaling pathways in DLD.

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#### Biography

Dr. [Anitha Ayyappan Pillai](#) did her Ph.D. at Rajiv Gandhi Centre for Biotechnology, Trivandrum in the field of [Population Genetics](#). She then worked as a Postdoctoral fellow and then as Assistant Professor at [Hamamatsu University School of Medicine](#), Japan. At present, she works as an Associate Professor at Institute for Communicative and Cognitive Neurosciences (ICCONS), Shoranur. Her main research area is [Neurogenetics](#). Dr. Anitha has received research grants from national and international funding agencies in India and Japan. She has authored >40 scientific papers in leading international journals and has co-authored book chapters.

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