A Mutually-Interacting Gene Network Controlling The Timing of Synaptic Development

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Research Abstract

Disruption of developmental events and gene expression during critical time windows of neuronal maturation have been implicated in numerous neurodevelopmental disorders (NDs). Almost nothing is currently known about the nature of temporal mechanisms that ensure coordinated gene expression required for synapse formation and circuitry function in the mature CNS. We have identified a gene program involved in synapse formation and function in cerebellar granule neurons that is temporally controlled by NFIA occupancy of target promoters. Recent findings show that this program undergoes auto-regulation, whereby critical program genes are regulated by and also promote NFIA temporal occupancy and program gene expression. Such self-regulating gene networks have important and interesting implications for both neuronal development and neurodevelopmental disorders.

References

