

SYNGAP1

see [SynGAP](#)

Haploinsufficiency of the SYNGAP1 gene, which codes for a Ras GTPase-activating protein, impairs cognition both in humans and in mice. Decrease of Syngap1 in mice has been previously shown to cause cognitive deficits at least in part by inducing alterations in glutamatergic neurotransmission and premature maturation of excitatory connections. Whether Syngap1 plays a role in the development of cortical GABAergic connectivity and function remains unclear. Here, we show that Syngap1 haploinsufficiency significantly reduces the formation of perisomatic innervations by parvalbumin-positive basket cells, a major population of GABAergic neurons, in a cell-autonomous manner. We further show that Syngap1 haploinsufficiency in GABAergic cells derived from the medial ganglionic eminence impairs their connectivity, reduces inhibitory synaptic activity and cortical gamma oscillation power, and causes cognitive deficits. Our results indicate that Syngap1 plays a critical role in GABAergic circuit function and further suggest that Syngap1 haploinsufficiency in GABAergic circuits may contribute to cognitive deficits ¹⁾.

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Berryer MH, Chattopadhyaya B, Xing P, Riebe I, Bosoi C, Sanon N, Antoine-Bertrand J, Lévesque M, Avoli M, Hamdan FF, Carmant L, Lamarche-Vane N, Lacaille JC, Michaud JL, Di Cristo G. Decrease of SYNGAP1 in GABAergic cells impairs inhibitory synapse connectivity, synaptic inhibition and cognitive function. Nat Commun. 2016 Nov 9;7:13340. doi: 10.1038/ncomms13340. PubMed PMID: 27827368.

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