Gut protein may protect brain cells in Parkinson's disease

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Functional GUCY2C protein and mRNA are expressed by DA neurons within the SNpc. a Schematic of mice used for analyses. b–d Immunofluorescence staining reveals that guanylyl cyclase C (GUCY2C) protein is expressed in 98% of tyrosine hydroxylase (TH)+ neurons, but not in astrocytes or microglia, in the mouse midbrain (n = 3). Scale bars represent 20 µM. e–l Combined immunofluorescence and RNAscope identifies high levels of Gucy2c mRNA co-expressed with TH protein and mRNA. Scale bars represent 200 µM (e–h) or 20 µM (i–l). m Gucy2c mRNA is not expressed by TH-negative cells (n = 3).
Gucy2c mRNA is expressed at nearly a third of Th mRNA levels in DA neurons \((n = 3)\) as determined through RNAscope. Treating \(Gucy2c^{+/+}\) (WT), but not \(Gucy2c^{-/-}\) (KO), SNpc with the GUCY2C agonist linaclotide (LIN), but not with inactive peptide control, upregulates intracellular cGMP production \((n = 9–11)\). Statistics were calculated using a two-tailed \(t\)-test \((m)\) or a two-way ANOVA with a false discovery rate.


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