GDF10

Growth and differentiation factor 10 (GDF10) is induced in periinfarct neurons in mice, non-human primates and humans. GDF10 promotes axonal outgrowth in vitro in mouse, rat and human neurons through TGFβRI and TGFβRII signaling. Using pharmacogenetic gain- and loss-of-function studies, Li et al. found that GDF10 produced axonal sprouting and enhanced functional recovery after stroke; knocking down GDF10 blocked axonal sprouting and reduced recovery. RNA sequencing from periinfarct cortical neurons revealed that GDF10 downregulated PTEN, upregulated PI3 kinase signaling and induced specific axonal guidance molecules. Using unsupervised genome-wide association analysis of the GDF10 transcriptome, they found that it was not related to neurodevelopment, but may partially overlap with other CNS injury patterns. Thus, GDF10 is a stroke-induced signal for axonal sprouting and functional recovery [1].

1)
Li S, Nie EH, Yin Y, Benowitz LI, Tung S, Vinters HV, Bahjat FR, Stenzel-Poore MP, Kawaguchi R, Coppola G, Carmichael ST. GDF10 is a signal for axonal sprouting and functional recovery after stroke. Nat Neurosci. 2015 Oct 26. doi: 10.1038/nn.4146. [Epub ahead of print] PubMed PMID: 26502261.