Supplemental information

Chemico-genetic discovery of astrocyte control of inhibition in vivo

Tetsuya Takano¹⁺, John Wallace¹, Katherine T. Baldwin¹, Alicia Purkey¹, Akiyoshi Uezu¹, Jamie L. Courtland², Erik J. Soderblom¹,³, Tomomi Shimogori⁴, Patricia F. Maness⁵, Cagla Eroglu¹,²⁺, Scott H. Soderling¹,²⁺

1. The Department of Cell Biology, Duke University Medical School, Durham, NC 27710, USA
2. Department of Neurobiology, Duke University Medical School, Durham, NC, 27710, USA
3. Duke Proteomics and Metabolomics Shared Resource and Duke Center for Genomic and Computational Biology, Duke University Medical School, Durham, NC, 27710, USA
4. Molecular Mechanisms of Brain Development, Center for Brain Science (CBS), RIKEN, Saitama 351-0198, Japan
5. Departments of Biochemistry and Biophysics and, University of North Carolina School of Medicine, Chapel Hill, North Carolina 27599, USA

*Corresponding authors;
Scott H. Soderling, Ph.D.
Professor and Chair of Cell Biology
Professor of Neurobiology
Duke University Medical Center
Email: scott.soderling@duke.edu

Cagla Eroglu, Ph.D.
Associate Professor
Departments of Cell Biology and Neurobiology
Duke University Medical Center
Email: cagla.eroglu@duke.edu

Tetsuya Takano, Ph.D.
Departments of Cell Biology
Duke University Medical Center
Email: tetsuya.takano@duke.edu
Supplementary Figure 1
### Supplementary Table 4: Primers used for constructions or sequences

| Primes                                                                 | Primers                                                                 |
|-----------------------------------------------------------------------|------------------------------------------------------------------------|
| pZac-GfaABC1D-TurboID-HA                                              | **Forward** 5'GAGAATTCACCATGAAAGACAATACTGTGCCTCTGAAGCT-3' |
|                                                                       | **Reverse** 5'TTACCCCTACGTGACGAGTTACCTAGGTTA-3'                      |
| pZac-GfaABC1D-TurboID-HA                                             | **Sequence primer 1** 5'AATTACAGCTCTTAAGGGCTAGTACTTTAA-3'            |
|                                                                       | **Sequence primer 2** 5'TAACCTTTACGTGACGAGTTACCTAGGTTA-3'            |
| pZac-GfaABC1D-TurboID-HA-surface                                      | **Forward** 5'GCGTTAAACAGCAATACTGTGCTGTGCCTCTGA-3'                  |
|                                                                       | **Reverse** 5'TCTAGACTACAGAAATGAGTGTTAGGCGTTGAGGA-3'                 |
| pZac-GfaABC1D-TurboID-HA-surface                                      | **Sequence primer 1** 5'AATTACAGCTCTTAAGGGCTAGTACTTTAA-3'           |
|                                                                       | **Sequence primer 2** 5'TTAATCCCTGCTCAGTGATG-3'                     |
| pZac-GfaABC1D-TurboID-HA-surface                                      | **Sequence primer 3** 5'CCACTAGTTGGTACATCGTTA-3'                    |
|                                                                       | **Sequence primer 4** 5'TTAATCTTATGAGCTTATATATGTA-3'                 |
| AAV-hSyn-V5-Split 1 N-TurboID                                        | **Forward** 5'GCGTTAAACAGGACTCCCACCAACCTCCCAACCC-3'                 |
|                                                                       | **Reverse** 5'CCACTAGTTTCTGTCGAGATGCAGTCCAGGC-3'                     |
| pZac-GfaABC1D-Split 1 C-TurboID-HA                                    | **Forward** 5'GCGTTAAACAGGCTGCTCATAATCTGCCAC-3'                    |
|                                                                       | **Reverse** 5'CCACTAGTTGGTACATCGTTA-3'                              |
| AAV-hSynl-V5-Split 2 N-TurboID                                        | **Forward** 5'CGTTAAACAGGACTCCCACCAACCTCCCAACCC-3'                  |
|                                                                       | **Reverse** 5'CCACTAGTTGGTACATCGTTA-3'                              |
| pZac-GfaABC1D-Split 2 C-TurboID-HA | Forward 5’-GCCTTTAACCGGGGACCAGCAGCAATCGG-3’ | Reverse 5’-CCTTTTTTTCTAGAAGATCAATCTCCGATCTCGAG-3’ |
|-----------------------------------|-----------------------------------------------|--------------------------------------------------|
| AAV-hSynl-V5-Split 1 N-TurboID AAV-hSynl-V5-Split 2 N-TurboID Sequence primer | 5’-TCAGCAGCTGAAGCTAGCTACTTAA-3’ | 5’-ATTACAGCTTTAAGGGACTAGTACTTAA-3’ |
| pZac-GfaABC1D-Split 1 C-TurboID-HA pZac-GfaABC1D-Split 2 C-TurboID-HA Sequence primer | 5’-AATTACAGCTTTAAGGGCTAGTACTTAA-3’ | 5’-ATTACAGCTTTAAGGGCTAGTACTTAA-3’ |
| AAV-U6sgRNA-GfaABC1D-Cre | Forward 5’-TTTTTTTTTCTAGAAGATCTACATCTCTGTGTA-3’ | Reverse 5’-TTTTTTTTTCTAGAAGATCTACATCTCTGTGTA-3’ |
| AAV-U6sgRNA-GfaABC1D-Cre Sequence primer | 5’-ATGAGATTTTTTTCCTGACCTCATCGCT-3’ | 5’-ATGAGATTTTTTTCCTGACCTCATCGCT-3’ |
| AAV-Ef1a-hNrCAM-HA | Forward 5’-TACCGGATCCTCTCTAGAACCATGCAGCTTTAAATAATGCGAAAAA-3’ | Reverse 5’-TACCGGATCCTCTCTAGAACCATGCAGCTTTAAATAATGCGAAAAA-3’ |
| AAV-Ef1a-hNrCAM-ΔIG-HA | Forward 5’-TACCGGATCCTCTCTAGAACCATGCAGCTTTAAATAATGCGAAAAA-3’ | Reverse 5’-TACCGGATCCTCTCTAGAACCATGCAGCTTTAAATAATGCGAAAAA-3’ |
| AAV-Ef1a-hNrCAM-ΔECD-HA | Forward 5’-TACCGGATCCTCTCTAGAACCATGCAGCTTTAAATAATGCGAAAAA-3’ | Reverse 5’-TACCGGATCCTCTCTAGAACCATGCAGCTTTAAATAATGCGAAAAA-3’ |
| Construct                     | Forward Sequence                           | Reverse Sequence                           |
|-------------------------------|--------------------------------------------|--------------------------------------------|
| AAV-Ef1a-hNrCAM- Signal peptide | 5′-AGGTGTCGAGGTACCCATGCAGCTTTAAATATAAT-3’ | 5′-TGGAGTCATGCTCTAGACACAGGAGAAAT-3’        |
| AAV-Ef1a-hNrCAM-HA Sequence primer 1 | 5′-ATTAGTTTCTCGAGCTTTTGGAGTA-3’ |                                                        |
| AAV-Ef1a-hNrCAM-HA Sequence primer 2 | 5′-TAGATTTAATCATACTCAAACCATAACAGCAGAA-3’ |                                                        |
| AAV-Ef1a-hNrCAM-HA Sequence primer 3 | 5′-TTAAAGGAGCTAAAGGAAGTGCTCTTCTCAT-3’ |                                                        |
| AAV-Ef1a-hNrCAM-HA Sequence primer 4 | 5′-AAATGTATCCAAATATATTGTCTCAGGCA-3’ |                                                        |
| AAV-GfaABC1D-hNrCAM-HA       | 5′-ATAGGCTAGCCTCGAGACCATGCAGCTTTAAATATAATGCGAAAA-3’ | 5′-TCTGCTCGAAGCGGCCGCTTATGCGTAATCCCGTGACATCGTAAGGGTAAAGAACAAGG AATTCATGCGTTGACA-3’ |
| AAV-GfaABC1D-hNrCAM-ΔIG-HA   | 5′-ATAGGCTAGCCTCGAGACCATGCAGCTTTACGAT-3’ | 5′-TCTGCTCGAAGCGGCCGCTTATGCGTAATCCCGTGACATCGTAAGGGTAAAGAACAAGG AATTCATGCGTTGACA-3’ |
| AAV-GfaABC1D-hNrCAM-ΔECD-HA  | 5′-ATAGGCTAGCCTCGAGACCATGGATGAGCTGGATTCTCTCCA-3’ | 5′-TCTGCTCGAAGCGGCCGCTTATGCGTAATCCCGTGACATCGTAAGGGTAAAGAACAAGG AATTCATGCGTTGACA-3’ |
| AAV-GfaABC1D-hNrCAM-Signal peptide | 5′-AGGGTACCATGCAGGCTTTAAATAAT-3’ | 5′-TTGAGTCATGCTCTCAGGACAGGAGAAAT-3’         |
| AAV-GfaABC1D-hNrCAM-HA | Sequence primer 1  |
|------------------------|-------------------|
|                        | 5'-TATCAAGGTTACAAGACAGGTGTTAAGGAGACCAATA-3' |
| AAV-GfaABC1D-hNrCAM-HA | Sequence primer 2  |
|                        | 5'-TAGATTTAATCATACATCTCAAACCATAACAGCAGAA-3' |
| AAV-GfaABC1D-hNrCAM-HA | Sequence primer 3  |
|                        | 5'-TTTAAAGGAGCTAAAGGAAGTGCTCTTCAT-3' |
| AAV-GfaABC1D-hNrCAM-HA | Sequence primer 4  |
|                        | 5'-AAATGTATTCCAAATATATTGTCAGGCA-3' |