# Supplementary Materials

# DDC-Promoter-Driven Chemogenetic Activation of SNpc
# Dopaminergic Neurons Alleviates Parkinsonian Motor Symptoms

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| Sample no. | #1 | #2 | #3 | #4 | avg. |
|---|---|---|---|---|---|
| Number of rDDC-mCh$^+$ neurons | 171 | 189 | 178 | 101 | 160 |
| Number of rDDC-mCh$^+$DDC$^+$ neurons | 133 | 141 | 123 | 75 | 118 |
| rDDC-mCh$^+$DDC$^+$/rDDC-mCh$^+$ (%) | 77.78% | 74.60% | 69.10% | 74.26% | 73.93% |

**Table S1.** Raw data table for Figure 1e.

| | sAP frequency (Hz) | |
|---|---|---|
| Rat no. | Before | + CNO |
| #1 | 1.2666 | 2.0666 |
| #2 | 11.1333 | 20.6667 |
| #3 | 7.5333 | 9.1333 |

| | | | |
|---|---|---|---|
| #4 | 12.4333 | | 17.1 |
| #5 | 6.36 | | 15.1 |

**Table S2.** Raw data table for Figure 2f.

| Stepping test | | Stepping ratio (contralateral step number / total step number) | | |
|---|---|---|---|---|
| Group | Rat no. | Before | PD | + CNO |
| Control | #1 | 0.500 | 0.449 | 0.443 |
| | #2 | 0.482 | 0.429 | 0.417 |
| | #3 | 0.500 | 0.438 | 0.400 |
| | #4 | 0.510 | 0.460 | 0.440 |
| | #5 | 0.480 | 0.430 | 0.460 |
| | #6 | 0.500 | 0.440 | 0.390 |
| hM3Dq | #1 | 0.500 | 0.418 | 0.464 |
| | #2 | 0.506 | 0.424 | 0.508 |
| | #3 | 0.490 | 0.450 | 0.500 |
| | #4 | 0.500 | 0.510 | 0.490 |
| | #5 | 0.490 | 0.450 | 0.480 |
| | #6 | 0.490 | 0.450 | 0.490 |

**Table S3.** Raw data table for Figure 3c.

| Balance beam test | | Foot slip (#) | | |
|---|---|---|---|---|
| Group | Rat no. | Before | PD | + CNO |
| Control | #1 | 2.5 | 3 | 5.5 |
| | #2 | 1 | 2 | 2.5 |
| | #3 | 2 | 5.5 | 6 |
| | #4 | 0.5 | 2.5 | 8 |
| | #5 | 2.5 | 1.5 | 8.5 |
| | #6 | 1 | 3.5 | 6 |
| hM3Dq | #1 | 5.5 | 4.5 | #1 |
| | #2 | 0.5 | 2.5 | 2 |
| | #3 | 2.5 | 6.5 | 1 |
| | #4 | 2 | 4.5 | 4.5 |
| | #5 | 1.5 | 5 | 0.5 |

| | #6 | 1 | 7.5 | 2.5 |
|---|---|---|---|---|

**Table S4.** Raw data table for Figure 4b.

| Balance beam test | | Balance beam score | | |
|---|---|---|---|---|
| Group | Rat no. | Before | PD | + CNO |
| Control | #1 | 3.5 | 3.5 | 2.5 |
| | #2 | 4.5 | 4 | 3.5 |
| | #3 | 3.5 | 2.5 | 2.5 |
| | #4 | 4.5 | 3.5 | 1.5 |
| | #5 | 4.5 | 3.5 | 2.5 |
| | #6 | 4.5 | 2 | 3 |
| hM3Dq | #1 | 4.5 | 2.5 | 3 |
| | #2 | 4.5 | 3.5 | 4 |
| | #3 | 3.5 | 2.5 | 4 |
| | #4 | 4 | 2 | 2.5 |
| | #5 | 4 | 2.5 | 4.5 |
| | #6 | 4.5 | 2 | 4 |

**Table S5.** Raw data table for Figure 4c.

| Group | Rat no. | Portion of c-fos$^+$ out of mCh$^+$ neurons (%) |
|---|---|---|
| Control + CNO | #1 | 0% |
| | #2 | 6% |
| | #3 | 14% |
| | #4 | 5% |
| | #5 | 13% |
| | #6 | 17% |
| | #7 | 35% |
| | #8 | 44% |
| hM3Dq + CNO | #1 | 80% |
| | #2 | 70% |
| | #3 | 75% |

| | | |
|---|---|---|
| | #4 | 77% |
| | #5 | 61% |
| | #6 | 46% |
| | #7 | 68% |
| | #8 | 70% |

**Table S6.** Raw data table for

| | | TH$^+$ neuron ratio (ipsi/contra) (%) | | | |
|---|---|---|---|---|---|
| Group | Rat no. | AP -5.30 ~ 5.59 mm | AP -5.30 ~ 5.79 mm | AP -5.80 ~ 6.03 mm | AP -6.04 ~ 6.30 mm |
| Control + CNO | #1 | 37.85% | 31.35% | 2.3% | 62.09% |
| | #2 | 50.76% | 30.96% | 9.5% | 48.59% |
| | #3 | 47.16% | 32.21% | 53.44% | 13.08% |
| | #4 | 41.7% | 27.27% | 81.56% | 70% |
| | #5 | 40.55% | 17.62% | 16.08% | 54.76% |
| | #6 | 64.68% | 8% | 41.33% | 73.61% |
| | #7 | 33.86% | 23.75% | 74.23% | 73.79% |
| | #8 | 54.31% | 35.88% | 50.56% | 77.61% |
| hM3Dq + CNO | #1 | 60.54% | 95.77% | 98% | 61.33% |
| | #2 | 88.67% | 44% | 90% | 63.72% |
| | #3 | 76.43% | 41.18% | 90.28% | 89.62% |
| | #4 | 82.28% | 68.29% | 96.4% | 88.09% |
| | #5 | 80.47% | 72.31% | 45.93% | 87.3% |
| | #6 | 84.73% | 75.92% | 65.42% | 26.24% |
| | #7 | 53.55% | 65.42% | 97.99% | 76.5% |
| | #8 | 61.94% | 80.53% | 91.67% | 71.63% |

**Table S7.** Raw data table for

| Group | slice | % of striatal TH staining density (ipsi/contra) |
|---|---|---|
| Control + CNO | #1 | 30% |
| | #2 | 48% |
| | #3 | 46% |
| | #4 | 49% |
| | #5 | 58% |
| | #6 | 57% |
| | #7 | 68% |
| | #8 | 54% |
| hM3Dq + CNO | #1 | 74% |
| | #2 | 72% |
| | #3 | 90% |
| | #4 | 72% |
| | #5 | 90% |
| | #6 | 81% |
| | #7 | 72% |
| | #8 | 86% |

**Table S8.** Raw data table for Figure 7b.