

Supplementary Table 3. Summary of virus information used in this study

Experimental Purpose	Virus Description (provided by User)	BrainVTA Corresponding Information
Detect GABAergic neuronal activity in the STRd	AAV2/9-GAD67-CRE-mCherry-WRPE-hGH2, AAV2/9-EF1a-DIO-jGCaMP7s-WPRE-hGH	1. Cat.#: PT-1187 Vector Name: rAAV-GAD67-CRE-mCherry-WPRE-hGH polyAPromoter: GAD67 Tag: mCherry 2. Cat.#: PT-4552 Vector Name: rAAV-EF1a-DIO-jGCaMP7s-WPRE-hGH polyA Promoter: EF1 α Tag: None
Identify downstream projection targets of the STRd	AAV2/9-hSyn-CRE-WPRE-Hgh-pA2, AAV2/9-EF1a-DIO-Ypet-2A-mGFP-WPRE-pA	1. Cat.#: PT-0136 Vector Name: rAAV-hSyn-CRE-WPRE-hGH polyAPromoter: hSyn Tag: None 2. Cat.#: PT-0593 Vector Name: rAAV-EF1 α -DIO-YPet-2A-mGFP-WPRE-pA Promoter: EF1 α Tag: Ypet, mGFP
Chemogenetic control of projections from the STRd to the Gpe region	AAV2/1-hSyn-Cre-EGFP-WPRE-hGH pA 2, AAV2/9-EF1a-DIO-hM3Dq-mCherry-WPREs	1. Cat.#: PT-0156 Vector Name: rAAV-hSyn-EGFP-P2A-CRE-WPRE-hGH polyA Promoter: hSyn Tag: EGFP 2. Cat.#: PT-0042 Vector Name: rAAV-EF1 α -DIO-hM3D(Gq)-mCherry-WPREs Promoter: EF1 α Tag: mCherry
Chemogenetic control of projections from the STRd to the Gpi regions	AAV2/1-hSyn-Cre-EGFP-WPRE-hGH pA2, AAV2/9-EF1a-DIO-hM4Di-mCherry-WPREs	1. Cat.#: PT-0156 (same as above) 2. Cat.#: PT-0043 Vector Name: rAAV-EF1 α -DIO-hM4D(Gi)-mCherry-WPREs Promoter: EF1 α Tag: mCherry
Chemogenetic modulation of projections from the STRd to the SNr	AAV2/1-hSyn-Cre-EGFP-WPRE-hGH pA2, AAV2/9-EF1a-DIO-hM4Di-mCherry-WPREs, AAV2/1-VGAT1-CRE-WPRE-hGH polyA, AAV2/9-hSyn-DIO-hM3D(Gq)-EGFP-WPREs	1. Cat.#: PT-0156 (same as above) 2. Cat.#: PT-0043 (same as above) 3.Cat.#: PT-0346 Vector Name: rAAV-VGAT1-CRE-WPRE-hGH polyA Promoter: VGAT1 Tag: None 4.Cat.#: PT-0891 Vector Name: AAV2/9-hSyn-DIO-hM3D(Gq)-EGFP-WPREs Promoter: hSyn Tag: EGFP
Activate GABAergic neurons in the SNr	AAV2/1-hSyn-Cre-EGFP-WPRE-hGH pA2, AAV2/9-EF1a-DIO-hM3Dq-mCherry-WPREs	1. Cat.#: PT-0156 (same as above) 2. Cat.#: PT-0042 (same as above)
Activate cholinergic neurons in the STRd region	AAV2/R-ChAT-CRE-P2A-EGFP-WPRE-hGH2. AAV2/9-EF1a-DIO-hM3Dq-mCherry-WPREs	1. Cat.#: PT-0652 Vector Name: rAAV-ChAT-CRE-P2A-EGFP-WPRE-hGH polyA Promoter: ChAT Tag: EGFP 2. Cat.#: PT-0042 (same as above)
Chemogenetic manipulation of D1-MSNs	AAV2/9-hSyn-DIO-hM3D(Gq)-P2A-EGFP-WPRE-polyA,AAV2/9-D1-CRE-mCherry-WPRE-hGH-polyA	1. Cat.#: PT-10816 Vector Name: rAAV-hSyn-DIO-hM3D(Gq)-P2A-EGFP-WPRE-polyA Promoter: hSyn Tag: EGFP 2. Cat.#: PT-0960 Vector Name: rAAV-D1-CRE-mCherry-WPRE-hGH-polyA Promoter: D1 Tag:mCherry