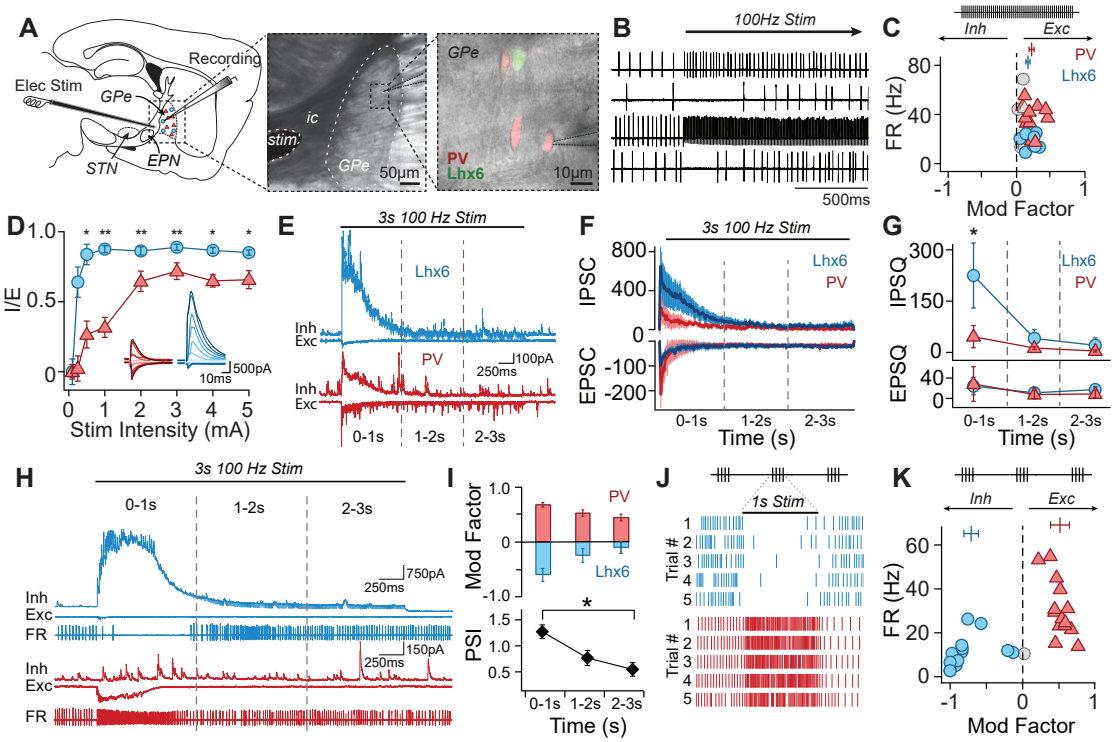
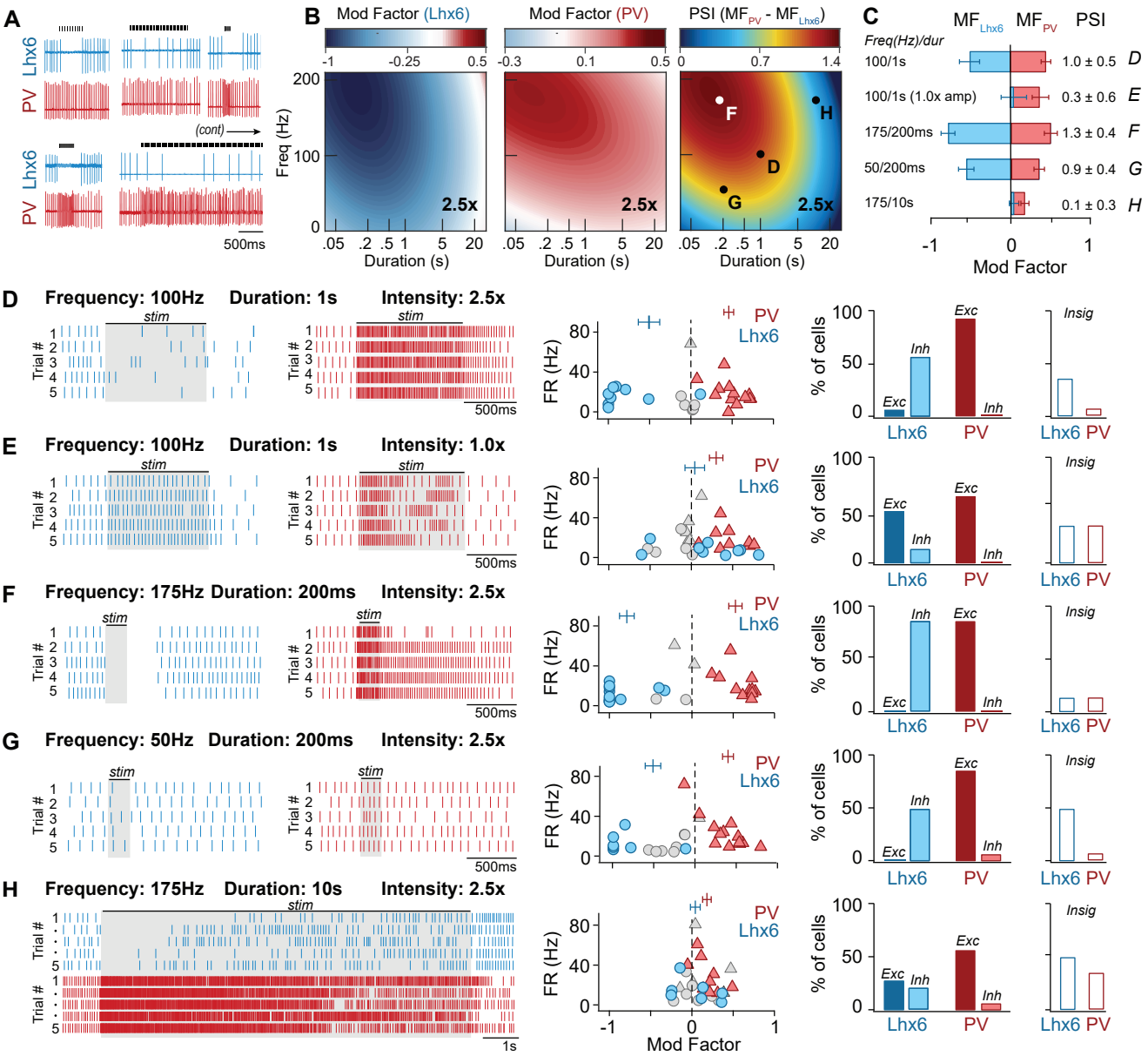
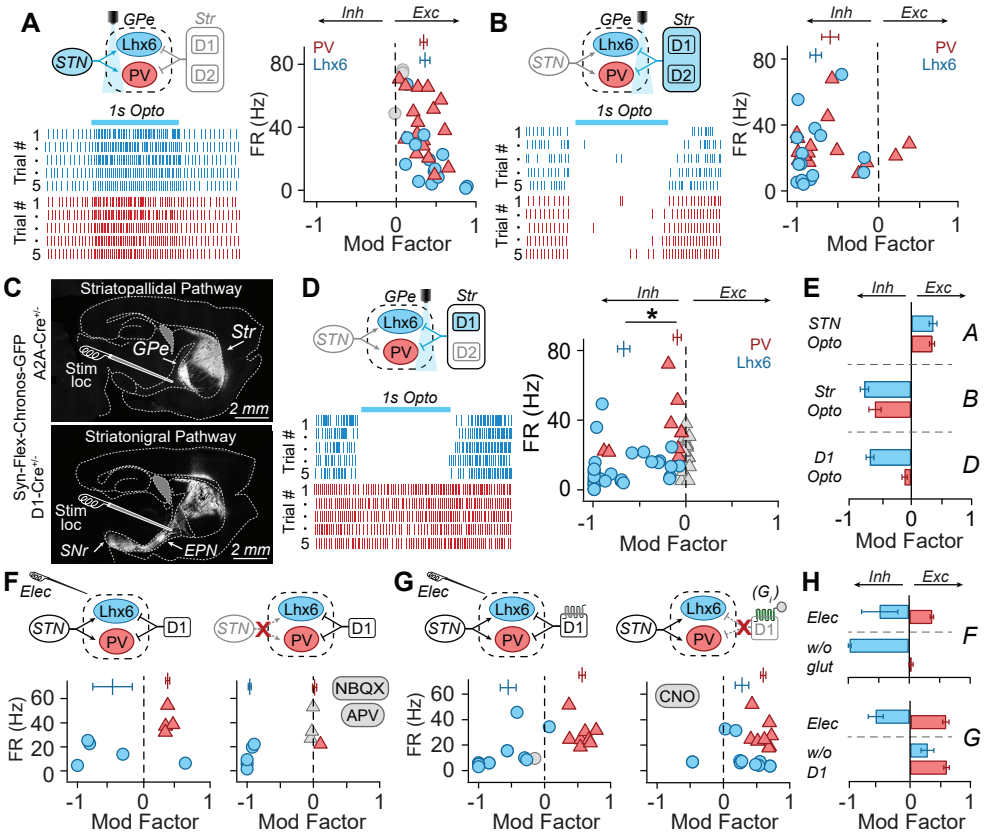
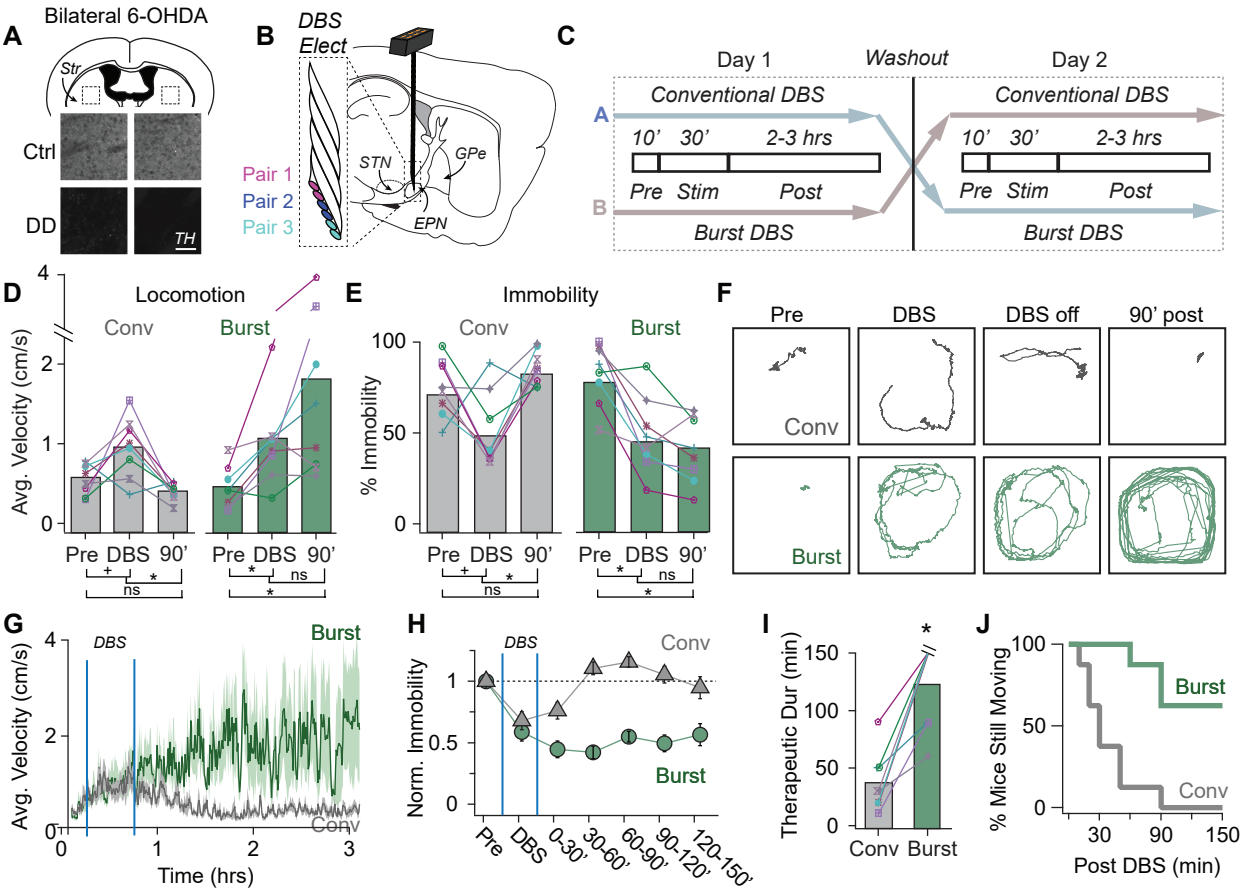

A
Recording
Elec Stim
GPe
V
STN
EPN
ic
stim
GPe
50µm
GPe
PV
Lhx6
10µm
B
100Hz Stim
500ms
C
Inh
Exc
PV
Lhx6
FR (Hz)
Mod Factor
D
I/E
Stim Intensity (mA)
500pA
10ms
E
3s 100 Hz Stim
Lhx6
PV
Inh
Exc
100pA
250ms
0-1s
1-2s
2-3s
F
3s 100 Hz Stim
IPSC
EPSC
Lhx6
PV
Time (s)
G
IPSQ
EPSQ
Lhx6
PV
Time (s)
H
3s 100 Hz Stim
0-1s
1-2s
2-3s
Inh
Exc
FR
750pA
250ms
150pA
250ms
I
Mod Factor
PV
Lhx6
PSI
Time (s)
J
1s Stim
Trial #
K
Inh
Exc
FR (Hz)
Mod Factor


A
Lhx6
PV
(cont)
500ms
B
Mod Factor (Lhx6)
Mod Factor (PV)
PSI (MF_PV - MF_Lhx6)
Freq (Hz)
Duration (s)
2.5x
C
MF_Lhx6 MF_PV PSI
Freq(Hz)/dur
100/1s 1.0 ± 0.5 D
100/1s (1.0x amp) 0.3 ± 0.6 E
175/200ms 1.3 ± 0.4 F
50/200ms 0.9 ± 0.4 G
175/10s 0.1 ± 0.3 H
Mod Factor
D Frequency: 100Hz Duration: 1s Intensity: 2.5x
E Frequency: 100Hz Duration: 1s Intensity: 1.0x
F Frequency: 175Hz Duration: 200ms Intensity: 2.5x
G Frequency: 50Hz Duration: 200ms Intensity: 2.5x
H Frequency: 175Hz Duration: 10s Intensity: 2.5x
stim
Trial #
FR (Hz)
% of cells
Exc
Inh
Insig
Lhx6
PV
1s


A
GPe
Str
STN
Lhx6
PV
D1
D2
1s Opto
Trial #
Inh
Exc
PV
Lhx6
FR (Hz)
Mod Factor
B
C
Striatopallidal Pathway
Striatonigral Pathway
Syn-Flex-Chronos-GFP
A2A-Cre+/-
D1-Cre+/-
Stim loc
SNr
EPN
2 mm
D
E
STN Opto
Str Opto
D1 Opto
F
Elec
NBQX
APV
G
CNO
H
w/o glut
w/o D1


A
Bilateral 6-OHDA
Str
Ctrl
DD
TH
B
DBS Elect
Pair 1
Pair 2
Pair 3
STN
GPe
EPN
C
Day 1
Washout
Day 2
Conventional DBS
10' 30' 2-3 hrs
Pre Stim Post
Burst DBS
D
Locomotion
Conv
Burst
Avg. Velocity (cm/s)
Pre DBS 90'
E
Immobility
% Immobility
F
Pre
DBS
DBS off
90' post
G
DBS
Time (hrs)
H
Norm. Immobility
Pre DBS 0-30' 30-60' 60-90' 90-120' 120-150'
I
Therapeutic Dur (min)
Conv Burst
J
% Mice Still Moving
Post DBS (min)