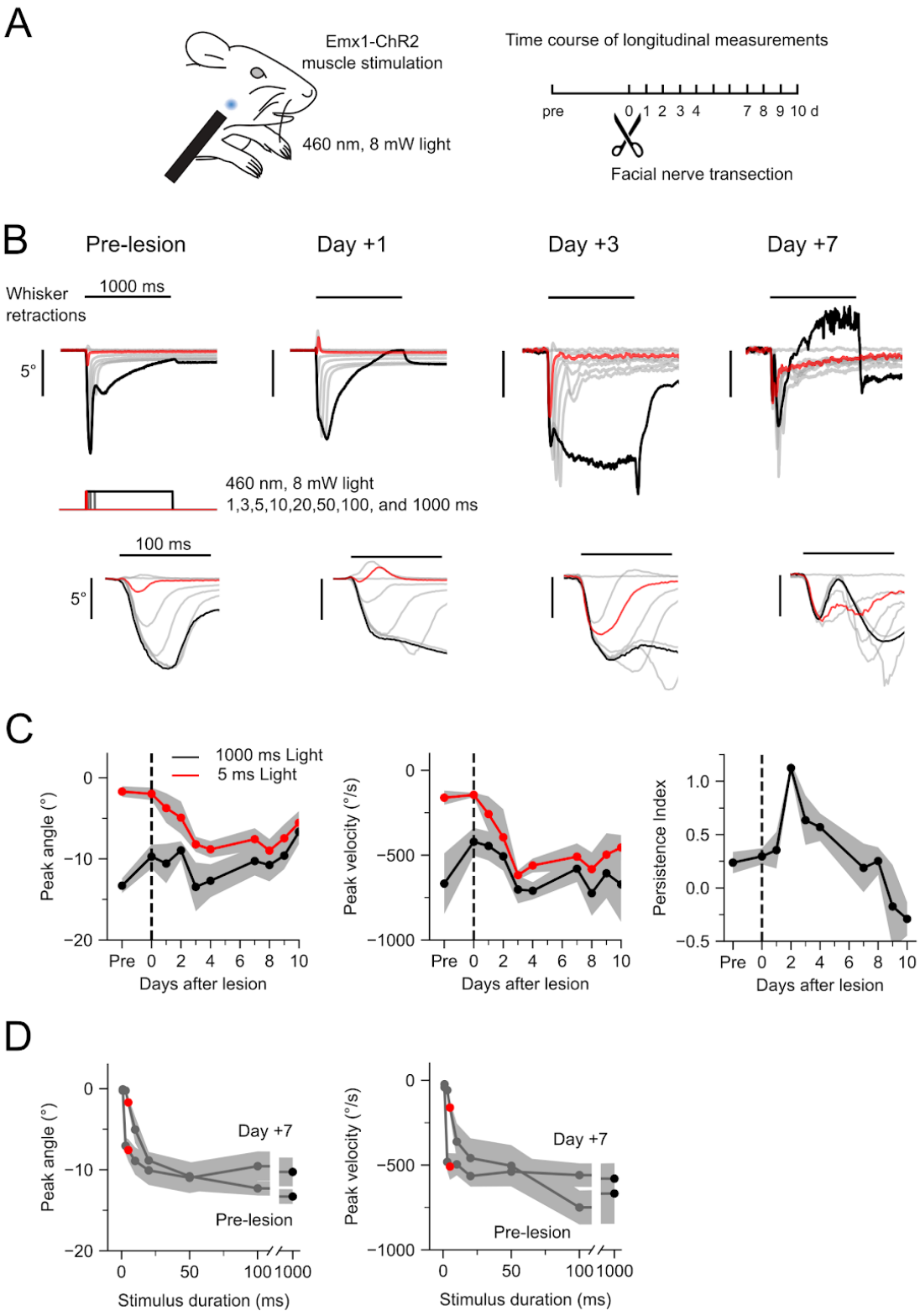
A
Emx1-ChR2
muscle stimulation
460 nm, 8 mW light
Time course of longitudinal measurements
pre
0 1 2 3 4
7 8 9 10 d
Facial nerve transection
B
Pre-lesion
Day +1
Day +3
Day +7
Whisker
retractions
1000 ms
5°
460 nm, 8 mW light
1,3,5,10,20,50,100, and 1000 ms
100 ms
5°
C
1000 ms Light
5 ms Light
Peak angle (°)
Peak velocity (°/s)
Persistence Index
Pre 0 2 4 6 8 10
Days after lesion
D
Day +7
Pre-lesion
Peak angle (°)
Peak velocity (°/s)
0 50 100 1000
Stimulus duration (ms)

Supplementary Figure 2. Effects of denervation at caudal retraction area.
(A) Optogenetic muscle paradigm. Left: Schematic of transdermal muscle illumination in Emx1-ChR2 mice. Position of optogenetic illumination indicated with blue spot. Right: Experimental timeline.
(B) Whisker retractions evoked by optogenetic nerve stimulation from an example mouse at various times relative to nerve transection. Each trace is the average of 10 responses to a different duration of illumination at 8 mW. red, 5 ms stimulus; black, 1000 ms stimulus; gray, 1, 3, 10, 20, 50, 100 ms. Insets (below) show movements on an expanded time scale.
(C) Time course of peak amplitude (left), time course of peak velocity (middle), and time course of persistence index from 1000 ms stimuli. High persistence index indicates low fatigability. Red, 5 ms; black, 1000 ms stimuli. Values are mean ± SEM; n=9 mice.
(D) Comparison of baseline and 7 d response duration families for peak amplitude (left) and peak velocity (middle). Red, 5 ms; black, 1000 ms stimuli. Values are mean ± SEM; n=9 mice.