

Supporting Information

Liao et al. 10.1073/pnas.1718826115

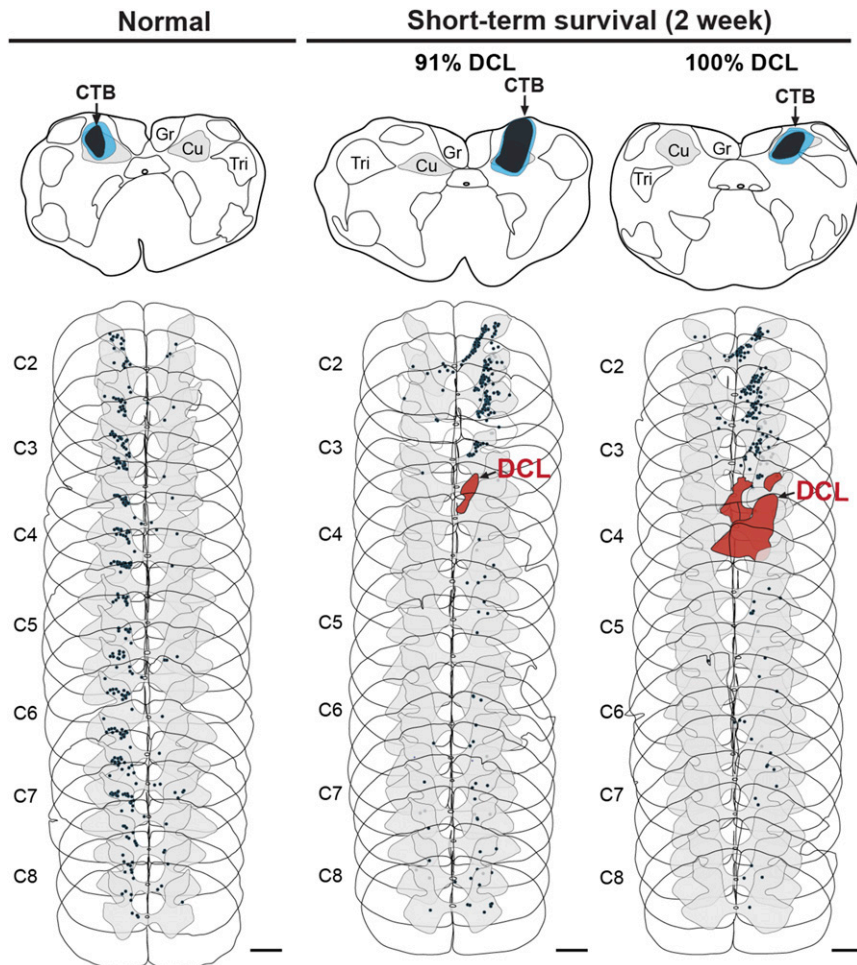


Fig. S1. The distributions of labeled neurons (blue dots) in the cervical spinal cord after CTB injection in the hand representation in the Cu in one normal monkey and in two monkeys at 2 wk after DCLs, estimated as incomplete (monkey SM-LM; 91% complete) and complete (monkey SM-RU; 100% complete). DCLs dramatically decreased the numbers of labeled neurons below the lesion in the cervical spinal cord ipsilateral to the lesion in the two monkeys. C2–C8, cervical spinal segments 2–8; Gr, gracile nucleus; Tri, trigeminal nucleus. (Scale bar: 1 mm.)

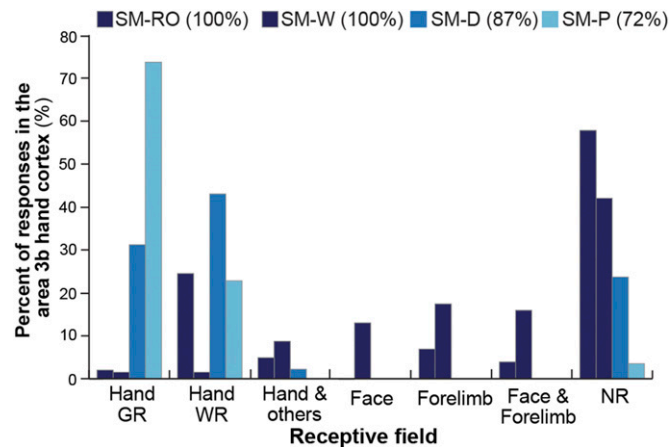


Fig. S3. Bar graph showing the percentage of cortical area in the affected hand region of area 3b responsive to touch on the hand, face, and forelimb or large receptive fields involving the hand, face, and/or forelimb ("others") in the four monkeys after prolonged recovery from DCL. GR, good response; NR, no response; WR weak response.

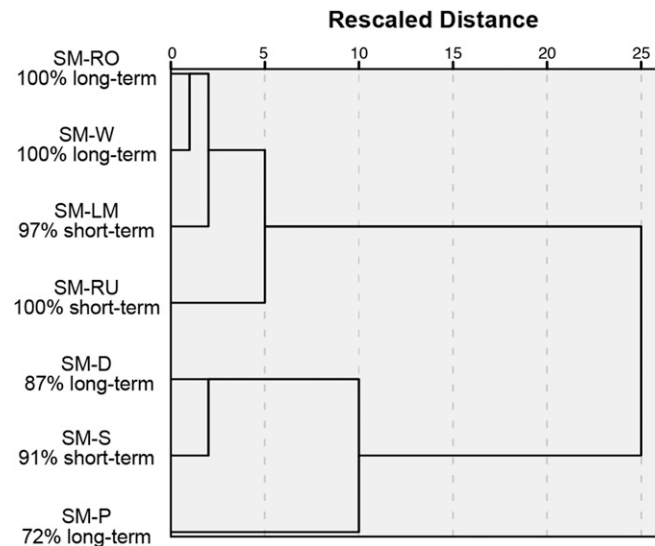


Fig. S4. Dendrogram using complete linkage hierarchical clustering of scaled factors (z-scores) showing the merging of the subjects into groups based on the distance or similarity between selected measures. The data used for the clustering analysis were (i) the proportions of labeled cells ipsilateral to and below the lesion, (ii) the extent of DCL, and (iii) the proportions of unresponsive electrode penetrations. The x-axis reflects the squared Euclidean distance between clusters. The y-axis shows the case identity, starting as separate clusters at distance 0. Supporting our categorization into <95% and >95% DCLs, monkey SM-LM (estimated 97% complete, short-term) clustered with cases with estimated 100% complete DCLs, while monkey SM-S (estimated 91% complete, short-term) clustered with cases that had less extensive DCLs. This grouping into categories was used for visualization and summary purposes (e.g., Fig. 3).

Table S1. Number of labeled neurons in the ipsilateral cervical spinal cord (C2–C8) from tracer injection in the Cu in monkeys after long-term DCLs

Location	Monkey (total <i>n</i>)			
	SM-RO (1,617)	SM-W (2,092)	SM-D (3,689)	SM-P (3,344)
Above lesion	1,554	1,969	2,599	1,887
Below lesion	63	123	1,090	1,457

Cases are listed by greatest to least extent of DCLs, from left to right (100%, 100%, 87%, and 72%).

Table S2. Numbers of labeled neurons in the entire spinal cord from tracer injection in monkeys after long-term DCLs

Location	Monkey (total <i>n</i>)							
	SM-RO (1856)		SM-W (2848)		SM-D (5079)		SM-P (4129)	
	Ipsilateral	Contralateral	Ipsilateral	Contralateral	Ipsilateral	Contralateral	Ipsilateral	Contralateral
Cervical	1,617	147	2,092	241	3,689	735	3,344	256
Thoracic	43	19	275	55	285	139	420	70
Lumbar sacral	7	9	68	81	104	113	19	20
	8	6	16	20	7	7	0	0
Total	1,675	181	2,451	397	4,085	994	3,783	346

Cases are listed by greatest to least lesion extent from left to right (100%, 100%, 87%, and 72%).

Table S3. Number of labeled neurons in the ipsilateral cervical spinal cord from tracer injection in monkeys after short-term DCLs and in normal monkeys

Level	Monkey (total <i>n</i>)				
	Short-term DCLs			Normal	
	SM-RU (301)	SM-LM (365)	SM-S (651)	SM-M (900)	SM-Y (533)
Above lesion/C2–C4	250	304	585	384	215
Below lesion/C5–C8	51	61	66	516	318

Cases are listed by greatest to least lesion extent from left to right (100%, 97%, and 91%) in the short-term DCL group.

From Liao et al. (2015) (1).

- Liao CC, DiCarlo GE, Gharbawie OA, Qi HX, Kaas JH (2015) Spinal cord neuron inputs to the cuneate nucleus that partially survive dorsal column lesions: A pathway that could contribute to recovery after spinal cord injury. *J Comp Neurol* 523:2138–2160.

Table S4. Correlations of the amount of second-order spinal cord projection (ratio of the normal projection) and percentage of neural receptive fields in the deafferented area 3b hand cortex

Receptive field	Spearman's rho	Lower limit*	Upper limit*	<i>P</i> value
HandGR	0.418	−0.489	0.891	0.3505
HandWR	0	−0.753	0.753	1
Hand and others	−0.577	−0.927	0.311	0.1754
Face	−0.412	−0.889	0.494	0.3585
Forelimb	−0.764	−0.963	−0.026	0.0455
Others	−0.764	−0.963	−0.026	0.0455
Unresponsive	−0.342	−0.871	0.554	0.4523

HandGR, hand good response; HandWR, hand weak response.

*Lower and upper limits of 95% confidence intervals.