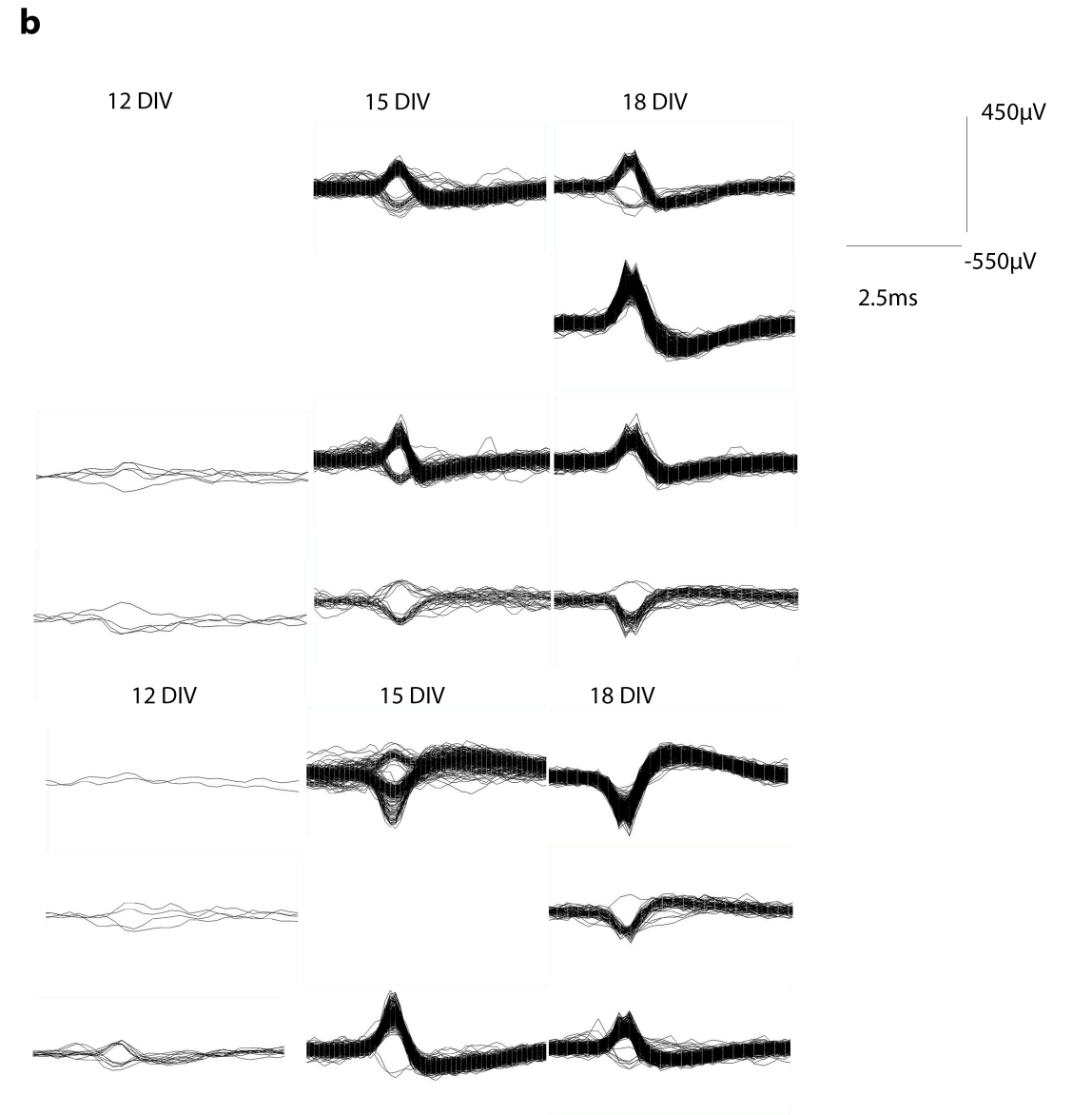
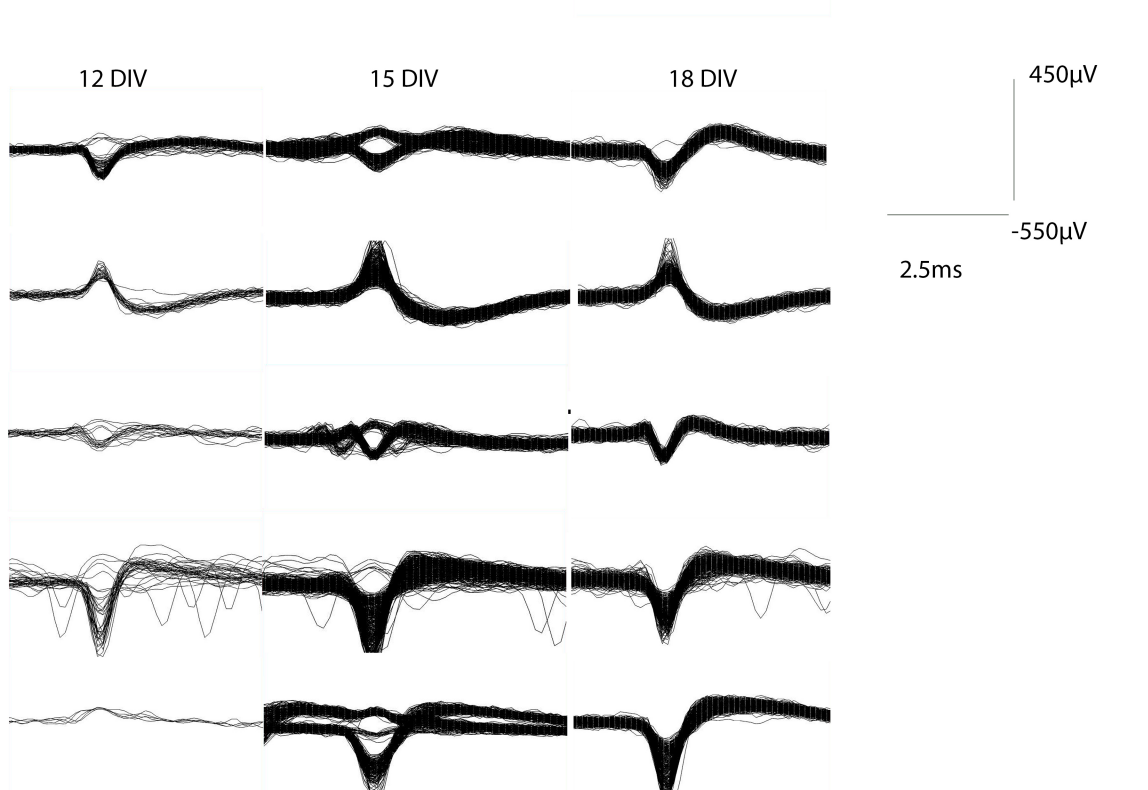


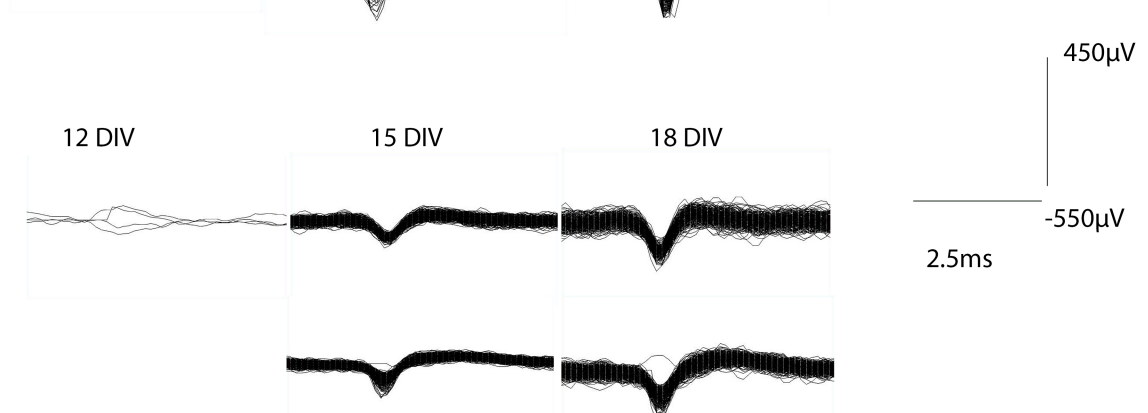
a
Experiment 1
6-15-23 CSM



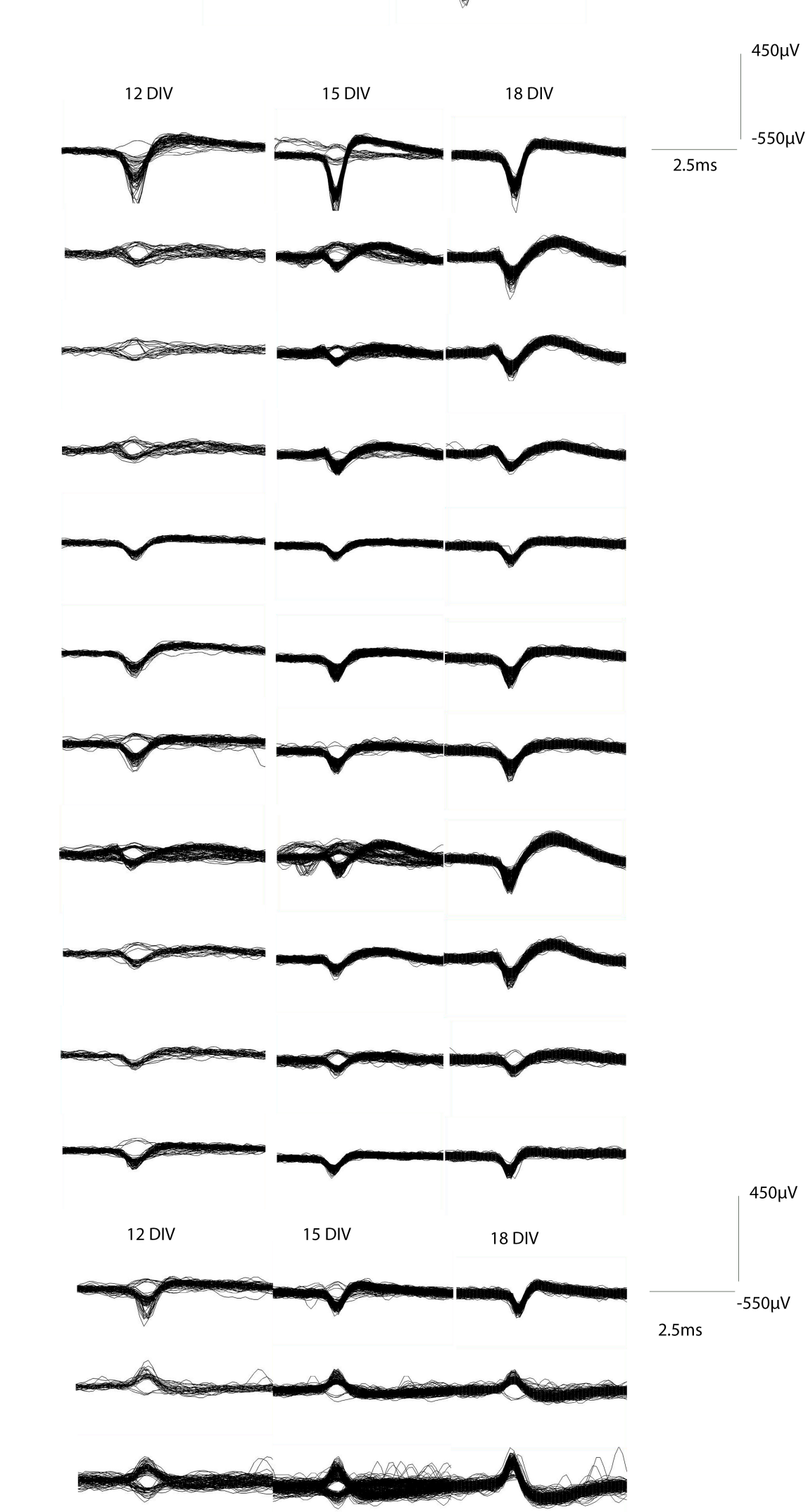
Experiment 2
7-6-23 CSM
21 24



Experiment 3
9-12-23 CSMN

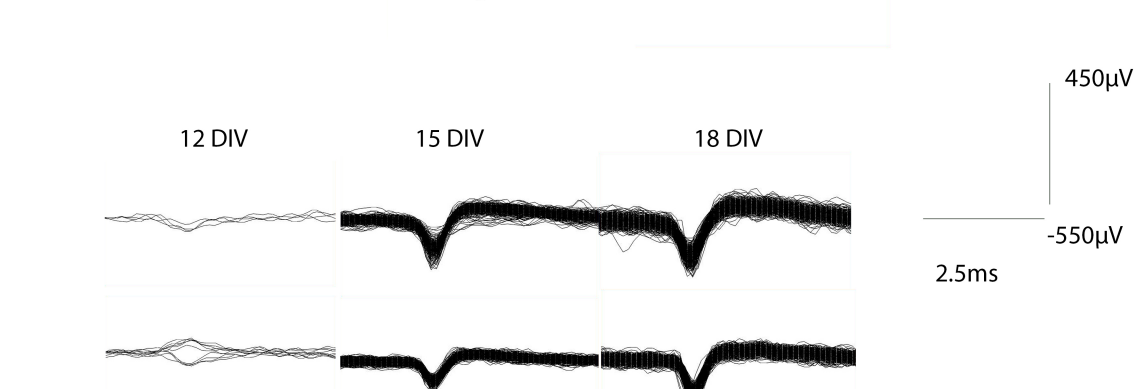


Experiment 4
10-4-23 CSM



Experiment 5

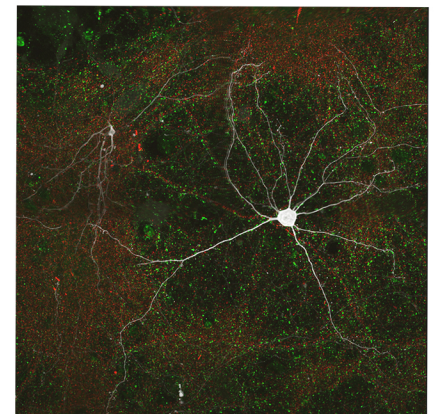
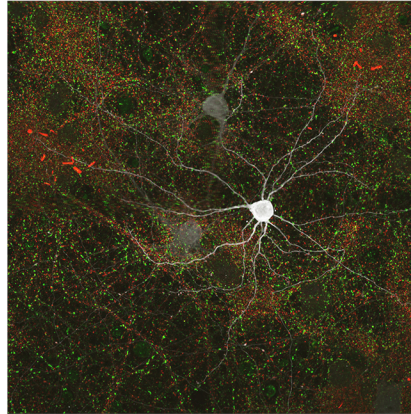
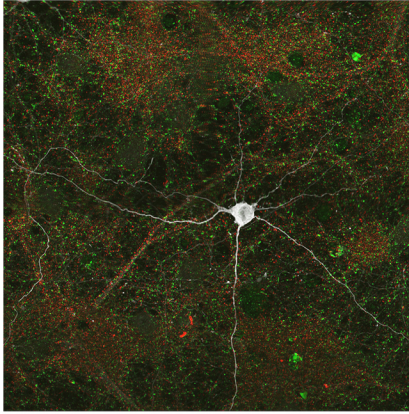
12-1-23 Calbino



Supplemental Figure 1: Summary of channels that harbor active CSMN and calbindin+ interneurons. (a) Image of CSMN (green) and calbindin+ (red) neurons in proximity to recording channel (channel outline indicated). (b) Summary of all waveforms extracted from 3min recording from corresponding channel at 12, 15 and 18DIV. Waveforms shown across 2.5ms window. Blank regions indicate inactive channel at corresponding age. The numbers in each image identify the location of each neuron on the chip.

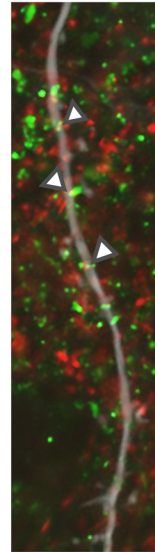
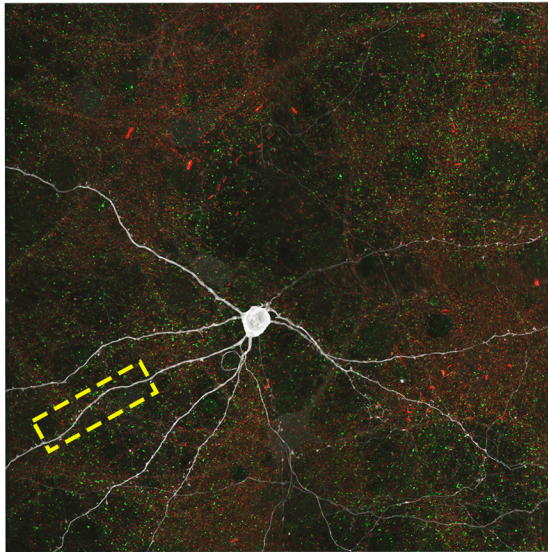
a

CSMN/Homer/Bassoon



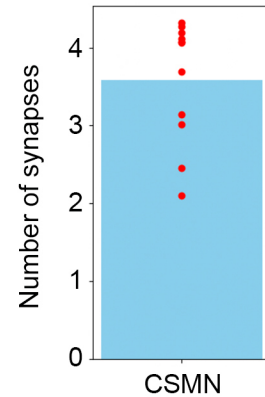
b

CSMN/Homer/Bassoon



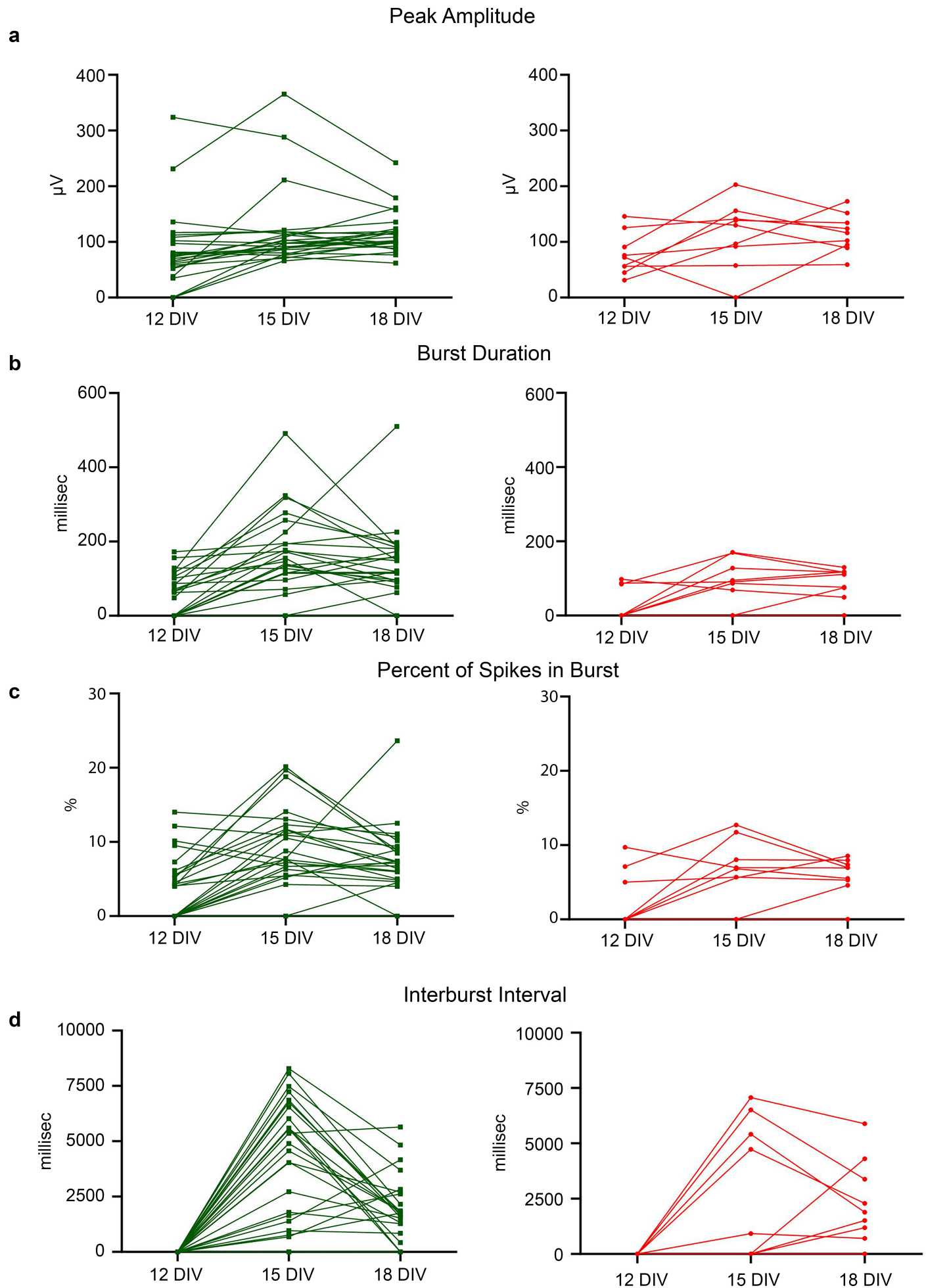
c

Number of synapses per 10 μ m of CSMN dendrite at 18 DIV



Supplemental Figure 2: Imaging of synapse formation in CSMN by 18 DIV.

(a-b) Representative images of individual CSMN (white). (b) Magnified view of neuronal process outlined in yellow. Presynaptic Bassoon (green) and postsynaptic Homer (red) puncta colocalization indicated by arrowhead. (c) Number of synapses per 10 μ m CSMN dendritic process at 18 DIV.



Supplemental Figure 3: Spike and burst properties for individual neurons from 12 DIV to 18 DIV. (a) Peak amplitude, (b) burst duration, (c) Percent of spikes in burst, (d) Inter-burst Interval for individual CSMN (green) and Calbindin (red) neurons. Values for individual channels indicated across 12, 15 and 18 DIV. Lines connect same channel recordings over different time points.

Supplemental Table 1: Total number of CSMN, Calbindin+ and GFAP+ per HD-MEA

Exp #	Total Dapi (18DIV)	Total CSMN (18DIV)	Total Calbindin (18DIV)	Total GFAP (18DIV)
1	2571	36	71	N/A
2	5455	94	N/A	NA
3	2373	58	15	35
4	4504	208	66	9
5	2218	52	8	46

Supplemental Table 2: Total number of channels analyzed per experiment

Exp #	Active Channels (18DIV)	CSMN (18DIV)	Calbindin (18DIV)
1	595	5	3
2	1960	5	0
3	505	3	1
4	1455	12	3
5	305	0	2