Table S1

Mouse ID	Sex	Recording age (weeks)*	Weight gram)*	Recording date (YY.MM.DD)	Brain area	Calcium indicator	Miniscope version	Frame rate (Hz)	Volume rate (Hz)	FOV(μm²)	Number of imaging planes	Number of repeated/total cells	Depth or interval (μm) <Laser power> (mW) **	Recording duration	Fig.2B.i-iii Video S1 PI	Fig.2B.iv-vi	Fig.2C.i-iiii Video S1 PII	Fig.2C.iv-vi	Fig.2D.i-iii Video S1 PIII	Fig.2D.iv-vi	Fig.2E***	Fig.S2D	Fig.S2E	Fig.3B****	Fig.3D	Fig.3E****	Fig.3F Video S2	Fig.3G Video S2	Fig.3H Fig.4 Fig.S4 Video S3	Fig.S3A.i-ii	Fig.S3A.iii-iv	Fig.S3A.v-viii	Fig.5A-H Fig.S5A-D Video S4	Fig.5K-P Fig.S5F-G	Fig.S6 Video S5	Fig.6A-E Video S6 PI	Fig.6F-M Video S6 PII
#93562	M	20	27	20.08.17	VC	Transgenic animal (CaMKII-tTA/tetO-GCaMP6s)	MINI2P-L$	15	15	420	1	NA/592	-120 <35>	20 min	■											■											
				20.08.19			MINI2P-L$	15	15	420	1	NA/301	-120<35>	20 min												■											
				20.06.29			MINI2P-F	40	40	420	1	NA/270	-120<55>	10 min												■											
				20.06.29			MINI2P-F	40	20	420	2	44/528	-80<28> -120<35>	10min										■	■											
				20.10.01			MINI2P-L$	15	3.8	420	4	61/1,164	-80 <30> -120 <35> -160 <50> -200 <60>	15 min											■											
				20.10.21			MINI2P-L$	15	7.5	420	2	13/315	-80 <28> -120 <35 >	30 min		■					■			■	■											
				20.10.27			MINI2P-L$	15	7.5	420	2	4/275	-80 <28> -120 <35 >	30 min		■									■											
				20.11.11			MINI2P-L$	15	7.5	420	2	22/333	-80 <28> -120 <35 >	30 min							■		■	■	■	■										
				20.11.17			MINI2P-L$	15	7.5	420	2	21/343	-80 <28> -120 <35 >	30 min							■		■	■	■	■				■						
				20.11.24			MINI2P-L$	15	7.5	420	2	11/268	-80 <28> -120 <35 >	30 min							■				■											
#94965	M	15	28	20.09.04			MINI2P-L$	15	15	420	1	NA/125	-130 <45 >	15 min												■											
				20.10.21			MINI2P-L$	15	7.5	420	2	9/299	-100 <35> -140 <40 >	30 min		■								■	■	■										
				20.10.27			MINI2P-L$	15	7.5	420	2	23/296	-100 <35> -140 <40 >	30 min		■								■	■	■										
#96766	M	24	27	21.03.14			MINI2P-L	15	7.5	500	2	6/406	-100 <38> -140 <50 >	40 min											■				■							
				21.03.14			MINI2P-L	15	7.5	500	2	10/521	-100 <38> -140 <50 >	30 min											■				■							
				21.03.13			MINI2P-L	15	7.5	500	2	6/525	-100 <38> -140 <50 >	30 min											■				■							
				21.03.13			MINI2P-L	15	7.5	500	2	2/378	-100 <38> -140 <50 >	30 min											■				■							
				21.03.13			MINI2P-L	15	7.5	500	2	4/275	-100 <38> -140 <50 >	30 min											■				■							
				21.03.14			MINI2P-L	15	7.5	500	2	1/271	-100 <38> -140 <50 >	30 min											■				■							
				21.03.05			MINI2P-L	15	7.5	500	2	3/150	-100 <30> -140 <38 >	40 min											■				■							
				21.03.06			MINI2P-L	15	7.5	500	2	2/147	-100 <20> -140 <38 >	40 min											■				■							
				21.03.08			MINI2P-L	15	7.5	500	2	0/116	-100 <30> -140 <38 >	30 min											■				■							
				21.03.12			MINI2P-L	15	7.5	500	2	3/176	-100 <38> -140 <50 >	30 min											■				■							
				21.03.15			MINI2P-L	15	7.5	500	2	15/557	-100 <38> -140 <50 >	30 min											■				■							
				21.03.06			MINI2P-L	15	7.5	500	2	4/487	-100 <30> -140 <38 >	30 min											■				■							
				21.03.07			MINI2P-L	15	7.5	500	2	0/344	-100 <30> -140 <38 >	30 min											■				■							
				21.03.07			MINI2P-L	15	7.5	500	2	3/480	-100 <30> -140 <38 >	30 min											■				■							
				21.03.12			MINI2P-L	15	7.5	500	2	0/173	-100 <38 > -140 <50 >	30 min											■				■							
				21.03.15			MINI2P-L	15	7.5	500	2	6/776	-100 <38 > -140 <50 >	30 min										■	■	■			■							
				21.03.09			MINI2P-L	15	7.5	500	2	6/650	-100 <44 > -140 <50 >	30 min		■								■	■	■			■							
				21.03.10			MINI2P-L	15	7.5	500	2	9/550	-100 <38 > -140 <44 >	30 min		■									■				■							
				21.03.10			MINI2P-L	15	7.5	500	2	2/529	-100 <30 > -140 <38 >	30 min											■				■							
				21.03.12			MINI2P-L	15	7.5	500	2	5/430	-100 <33 > -140 <44 >	30 min											■				■							
				21.03.15			MINI2P-L	15	7.5	500	2	3/350	-100 <38 > -140 <50 >	30 min											■				■							
				21.03.10			MINI2P-L	15	7.5	500	2	9/605	-100 <33 > -140 <44 >	30 min										■	■	■			■							
				21.03.11			MINI2P-L	15	7.5	500	2	7/551	-100 <38 > -140 <50 >	30 min											■				■							
				21.03.11			MINI2P-L	15	7.5	500	2	5/506	-100 <20 > -140 <38 >	30 min											■				■							
				21.03.11			MINI2P-L	15	7.5	500	2	4/456	-100 <20 > -140 <38 >	30 min											■				■							
#98351	M	21	24	21.08.20			MINI2P-F	40	10	420	4	32/1,033	-80 <30> -120 <35> -160 <50> -200 <60>	30 min												■	■										
				21.08.29			MINI2P-F	40	10	420	4	31/865	-80 <40> -120 <45> -160 <53> -200 <60>	30 min												■											
				21.08.29			MINI2P-F	40	2	420	20	NA	-80 to -200 <30-60>	30 min														■									
#99725	M	23	25	21.12.13			MINI2P-L	15	15	500	1	208	-140<49>	30 min																							■
#94158	F	22	24	20.08.22	MEC		MINI2P-L$	15	15	420	1	NA/65	-150 <40 >	15min												■											
#94553	F	20	23	20.08.20			MINI2P-L$	15	15	420	1	NA/83	-150 <40 >	15 min												■											
#94557	M	21	28	20.10.08			MINI2P-L$	15	15	420	1	NA/404	-120 <35 >	30 min			■									■											
				20.10.08			MINI2P-L$	15	7.5	420	2	41/579	-100 <36 > -140 <45 >	30 min				■						■	■	■					■						
				20.10.16			MINI2P-L$	15	7.5	420	2	43/315	-100 <36 > -140 <45 >	30 min				■						■	■	■											
#94556	F	20	21	20.08.24			MINI2P-L$	15	7.5	420	2	2/105	-100 <36 > -140 <45 >	15 min										■	■	■											
#97045	M	16	28	21.03.05			MINI2P-L	15	7.5	500	2	8/239	-100 <38 > -140 <50 >	60 min											■								■				
				21.03.06			MINI2P-L	15	7.5	500	2	0/96	-100 <33 > -140 <50 >	60 min											■								■				
				21.03.07			MINI2P-L	15	7.5	500	2	13/364	-100 <38 > -140 <50 >	60 min				■						■	■	■							■				
				21.03.08			MINI2P-L	15	7.5	500	2	9/306	-100 <36 > -140 <50 >	60 min									■	■	■	■							■				
				21.03.14			MINI2P-L	15	7.5	500	2	0/141	-100 <36 > -140 <45 >	60 min											■								■				
				21.03.17			MINI2P-L	15	7.5	500	2	14/502	-100 <36 > -140 <45 >	60 min				■					■	■	■	■							■				
#97046	M	16	27	21.03.07			MINI2P-L	15	7.5	500	2	2/84	-100 <38 > -140 <50 >	60 min				■							■												
				21.03.08			MINI2P-L	15	7.5	500	2	47/637	-100 <36 > -140 <50 >	60 min				■				■		■	■	■											
				21.03.09			MINI2P-L	15	7.5	500	2	21/248	-100 <36 > -140 <45 >	60 min									■		■												
				21.03.12			MINI2P-L	15	7.5	500	2	58/644	-100 <36 > -140 <45 >	70min										■	■	■											
				21.03.13			MINI2P-L	15	7.5	500	2	8/204	-100 <36 > -140 <45 >	70min											■												
				21.03.16			MINI2P-L	15	7.5	500	2	22/274	-100 <36 > -140 <45 >	90min									■	■	■	■											
#99643	M	29	20	21.11.25			MINI2P-L	15	15	500	1	NA/269	-100 <42 >	30min																						■	
				21.11.26			MINI2P-L	15	15	500	1	NA/240	-100 <38 >	30min																						■	
				21.11.28			MINI2P-L	15	15	500	1	NA/325	-120 <42 >	30min																						■	
#100072	M	20	25	21.12.17			MINI2P-L(1p)	15	15	500	1	NA/139	-120<0.02 (488 nm)>	30min																					■		
				21.12.21			MINI2P-L	15	15	500	1	NA/290	-120<49>	30min																					■		
#97288	F	17	22	21.03.15	CA1	AAV-GCaMP7	MINI2P-L$	15	15	420	1	NA/162	NA<62>	10 min												■											
				21.03.29			MINI2P-L$	15	7.5	420	2	147/470	50<62>	30 min						■				■	■	■											
#97289	F	17	22	21.03.15			MINI2P-L$	15	15	420	1	NA/150	NA<62>	10 min												■											
				21.03.16			MINI2P-L$	15	7.5	420	2	47/259	40<62>	30 min						■				■	■	■											
				21.03.22			MINI2P-L$	15	7.5	420	2	72/405	50<62>	30 min						■				■	■	■											
				21.04.19			MINI2P-L$	15	7.5	420	2	127/467	60<62>	30 min						■				■	■	■					■		■				
#97429	M	16	30	21.03.15			MINI2P-L$	15	15	420	1	NA/148	NA<62>	30 min												■											
				21.03.17			MINI2P-L$	15	15	420	1	NA/464	NA<62>	30 min					■							■											
				21.03.18			MINI2P-L$	15	15	420	2	24/386	60<62>	30 min						■				■	■	■											

*** Age is reported for the day of the first recording, weight is reported for the day of implantation;**
**** Laser power was measured under the objective; depth for VC and MEC is for the superficial imaging plane; for CA1 depth refers to the distance between 2 imaging planes (not applicable for CA1 single-plane imaging).**
***** Only the most superficial plane was used for cell registration;**
****** The 3 FOVs with the largest number of cells in each animal were included for statistics;**
$ With a 4-mm focal-length scan lens;