

Mouse ID	Session ID	Control place cells	Delayed place cells	Silenced place cells	Sessions with pair of ensembles <sup>1</sup>	Number of PYR cells	Excluded PYR <sup>2</sup>	Control PYR cells	Delayed PYR cells	Silenced PYR cells	Number of trials
1	session 1	3	0	2		13	5	6	0	2	52
	session 2	5	0	0		12	4	7	0	1	49
2	session 1	5	0	10	•	28	3	8	0	17	54
	session 2	5	0	6	•	29	9	10	0	10	60
	session 3	9	0	16	•	47	8	9	0	30	55
3	session 1	2	0	0		30	4	22	0	4	34
	session 2	6	2	0		35	6	23	6	0	38
	session 3	5	0	5	•	31	1	18	0	12	45
	session 4	2	3	0		22	5	5	12	0	60
	session 5	2	0	0		21	3	18	0	0	50
	session 6	13	0	8	•	38	3	23	0	12	56
4	session 1	18	0	13	•	41	1	25	0	15	50
	session 2	28	0	13	•	59	7	33	0	19	48
	session 3	18	11	0	•	44	6	23	15	0	51
	session 4	5	0	0		44	4	35	4	1	41
	session 5	26	2	6	•	50	9	30	3	8	49
	session 6	20	0	6	•	45	6	24	0	15	50
	session 7	26	13	0	•	51	8	29	14	0	51
	session 8	6	6	3	•	33	4	12	11	6	50
	session 9	11	2	5	•	31	4	15	3	9	50
5	session 1	0	1	8		14	2	1	2	9	36
	session 2	6	4	6	•	23	1	7	5	10	42
	session 3	10	0	16	•	54	11	15	0	28	29
	session 4	12	22	0	•	55	13	13	29	0	42
	session 5	13	0	7	•	35	8	16	0	11	43
	session 6	8	6	0	•	22	2	11	9	0	45
	session 7	7	0	23	•	47	8	7	0	32	50
	session 8	5	9	0	•	24	1	7	16	0	46
	session 9	7	0	14	•	42	12	8	0	22	46
Total		283	81	167		1020	158	460	129	273	1372

**Supplementary Table 1:** Summary of the number of place cells from each group recorded in each session and number of learning trials. Highlighted in color boxes are the sessions used for population vector analysis of Figure 5 (at least 5 place cells simultaneously recorded).

<sup>1</sup> Sessions used for population vector analysis of simultaneously recorded ensembles (see Fig. 6)

<sup>2</sup> Excluded because of undefined light response, because the cell showed increased firing during light pulses, or because it was located on the illuminated shank but not modulated by light (excluded control cell; see online Methods)