

Table S1:

		Wake		SWS		REM sleep	
		Control mice	M3 expressing PZ mice	Control mice	M3 expressing PZ mice	Control mice	M3 expressing PZ mice
Light	% of time	36.3±1.4	36.2±1.4	56.5±1.4	56.0±1.4	6.3±0.3	6.3±0.4
	Number	130.9±7.8	122.8±10.0	134.1±7.7	127.2±10.2	47.3±2.0	48.7±4.4
	Duration (sec)	121.8±7.1	126.7±10.2	193.7±12.4	212.8±17.1	59.9±2.5	60.8±2.4
Dark	% of time	57.2±2.4	52.9±1.9	39.1±2.3	43.1±1.7	3.6±0.4	4.0±0.3
	Number	87.6±6.5	91.8±7.2	88.2±6.8	92.5±7.3	26.4±2.6	27.4±2.6
	Duration (sec)	315.9±34.2	282.8±25.1	198.4±12.2	210.0±13.5	61.4±3.3	63.2±3.6

Supplementary Table 1: Percentage, number of bouts and mean (\pm SEM) bout duration (sec) of spontaneous sleep-wake state (Wake, SWS and REM sleep) in mice expressing the hM3Dq receptor in GABAergic PZ neurons ($n = 13$) as compared with non-cre-expressing littermate mice ($n = 13$). Averages are given for the 12-hour light period and the 12-hour dark period. No significant differences were found using a mixed model ANOVA. A mixed factorial ANOVA using the between-subjects factor of hM3Dq expression (control and PZ hM3Dq expressing mice) and the within-subjects factors of time of day (light and dark periods) and sleep-wake stage (W, SWS and REM sleep) was used to analyze the percentage(s) of time spent in W, SWS and REM sleep, as well as the frequency and average bout durations of each stage during the light and dark periods.

Table S2:

			Wake		SWS		REM sleep	
			Vehicle	CNO	Vehicle	CNO	Vehicle	CNO
Control mice Injection at 7 P.M. N = 12	Time	Latency (min)			42.3±16.1	61.5±22	110.1±19.3	117.9±19.4
	19-22	% of time	67.3±4.5	62.0±6.1	31.3±4.2	36.4±5.9	1.4±0.4	1.6±0.5
		Number	23.0±3.8	16.6±3.1	22.5±3.7	16.1±3.3	3.2±0.9	3.3±0.9
		Duration (min)	23.4±17.2	43.3±24.6	2.6±0.3	3.9±0.7	0.7±0.2	0.9±0.2
	22-1	% of time	58.5±3.3	55.3±2.3	38.9±3.1	42.2±2.3	2.6±0.3	2.5±0.5
		Number	22.7±2.0	21.0±2.3	22.7±2.2	21.8±2.4	5.1±0.6	4.8±0.9
Duration (min)		5.4±0.7	4.9±0.7	3.2±0.3	3.8±0.3	1.0±0.1	1.1±0.2	
M3- expressing PZ mice Injection at 7 P.M. N = 13		Latency (min)			30.5±6.4	6.4±0.5 ^B	72.1±11.7	640.8±72.3 ^C
	19-22	% of time	61.0±3.4	19.2±3.1 ^C	36.6±2.9	80.7±3.1 ^C	2.5±0.6	0.0±0.0 ^C
		Number	24.1±2.2	32.8±4.4	24.0±2.4	32.4±4.4	5.7±1.5	0.1±0.1 ^B
		Duration (min)	5.9±1.1	1.1±0.1	3.0±0.3	6.3±1.3 ^C	0.8±0.1	0.1±0.1 ^C
	22-1	% of time	55.2±3.5	62.8±7.7	41.5±3.1	37.2±7.7	3.2±0.5	0.0±0.0 ^C
		Number	25.1±2.3	36.4±6.8	25.4±2.4	36.3±6.7	5.7±0.9	0.1±0.1 ^C
		Duration (min)	4.5±0.8	8.2±3.5	3.2±0.2	2.0±0.3	1.1±0.1	0.0±0.0 ^C
	1-7	% of time	46.1±2.1	59.6±6.0	49.2±1.9	38.4±5.6	4.8±0.4	1.4±0.4 ^C
		Number	50.3±3.8	44.6±5.9	51.5±3.8	45.3±6.0	16.2±2.1	8.5±2.3 ^A
		Duration (min)	3.9±0.6	10.2±4.4	3.3±0.3	3.0±0.5	1.1±0.1	0.8±0.1 ^A
	7-19	% of time	36.5±1.9	36.8±2.6	57.2±1.8	57.1±2.2	6.2±0.4	5.6±0.8
		Number	120.2±9.9	85.5±5.1 ^C	124.4±10.3	88.0±5.2 ^C	48.0±5.5	36.1±5.1 ^B
		Duration (min)	2.2±0.2	3.0±0.3	3.6±0.3	4.8±0.3	1.0±0.0	1.1±0.1
	D+1 19-7	% of time	52.6±2.4	53.8±2.6	43.6±2.1	43.3±2.2	3.8±0.4	3.7±0.6
		Number	88.8±6.3	116.1±12.0 ^B	89.6±6.6	118.8±12.8 ^B	27.0±3.3	37.3±7.4 ^A
Duration (min)		4.8±0.5	3.2±0.5 ^A	3.6±0.2	3.3±0.2	1.0±0.1	1.1±0.1	
M3- expressing PZ mice Injection at 10 A.M. N = 13		Latency (min)			32.2±6.9	6.3±0.6 ^C	76.7±15.3	329.6±38.2 ^B
	10-13	% of time	42.8±3.6	12.7±1.4 ^C	51.9±3.2	87.3±1.4 ^C	5.4±0.6	0.1±0.1 ^C
		Number	32.3±4.3	21.2±3.3	32.6±4.4	21.0±3.3	9.5±1.6	0.1±0.1 ^C
		Duration (min)	4.0±1.6	1.4±0.2	3.7±0.6	15.0±6.5	1.2±0.1	0.1±0.1 ^C
	13-16	% of time	30.6±2.3	39.6±5.2	61.7±2.2	58.7±5.0	7.7±0.6	1.7±0.7 ^C
		Number	34.9±2.6	34.9±2.9	36.2±2.6	34.8±2.9	15.9±1.7	2.2±0.8 ^C
		Duration (min)	1.6±0.2	2.4±0.5	3.3±0.3	3.3±0.4	0.9±0.1	0.8±0.2
	16-19	% of time	37.5±2.0	39.9±3.7	55.2±2.1	57.0±3.5	7.3±0.7	3.0±0.7
		Number	39.2±7.1	32.2±3.3	39.8±7.0	32.5±3.3	14.2±2.3	5.0±1.4
		Duration (min)	2.0±0.2	2.6±0.3	3.1±0.2	3.4±0.3	1.1±0.1	1.1±0.1
	19-7	% of time	52.5±2.1	56.9±2.6	43.8±1.8	39.4±2.2	3.7±0.4	3.7±0.5
		Number	102.7±5.4	92.7±6.0	103.1±5.4	93.9±6.0	25.8±3.1	22.5±3.3
Duration (min)		3.9±0.3	4.8±0.5	3.1±0.1	3.1±0.2	1.0±0.1	1.3±0.1	

Supplementary Table 2: Sleep latencies, percentage, number of bouts and mean (\pm SEM) bout duration (sec) of spontaneous sleep-wake state (Wake, SWS and REM sleep) in non-hM3Dq-expressing mice ($n = 12$) and hM3Dq-expressing mice ($n = 13$), following CNO (0.3 mg/kg) or vehicle injections. A mixed factorial ANOVA using the between-subjects factor of injection (vehicle and CNO) and the within-subjects factors of time of day (analyzed periods) and sleep-wake stage (W, SWS and REM sleep) was used to analyze the percentages of time spent in W, SWS and REM sleep, as well as the frequency and average bout durations of each stage during the light and dark periods. ^A $p < 0.05$, ^B $p < 0.01$ and ^C $p < 0.001$.