Supplemental Table 2. Cosinor analyses of cFOS expression in constant darkness (Circadian Time) and in a 12:12 LD cycle (Zeitgeber Time). Mesor and amplitude are presented as relative expressions, phase angle is presented in radians. All means are presented +/- SEMs. Bolded values are significant with p<0.05.

i) Circadian Time

a) SD rat		**Mesor**	**Amplitude**	**Phase Angle**	**Cosinor Analysis**
	dLGN	29.08±2.48	4.07±1.53	1.57±0.25	F(2,28) = 0.74, *p* = 0.49
	IGL	8.36±1.00	1.09±0.15	1.25±0.23	F(2,28) = 0.27, *p* = 0.76
	vLGN	10.82±1.99	5.13±0.01	0.80±0.38	F(2,28) = 1.52, *p* = 0.24
	OPN	4.48±1.06	3.08±0.88	1.56±0.36	F(2,27) = 2.10, *p* = 0.14
	LHb	14.77±1.81	3.75±0.35	0.36±0.35	F(2,28) = 1.03, *p* = 0.37
	MHb	8.72±2.07	1.98±0.98	1.29±0.06	F(2,28) = 0.30, *p* = 0.75
	SC	14.22±1.80	1.28±0.58	1.47±0.09	F(2,28) = 0.02, *p* = 0.99
b) Grass Rat					
	dLGN	24.63±3.47	8.91±1.75	1.57±0.36	F(2,32) = 1.51, *p* = 0.24
	IGL	**11.11±1.24**	**6.31±0.46**	**1.28±0.37**	**F(2,31) = 6.19, *p* = 0.01**
	vLGN	2.68±0.836	1.75±0.17	0.41±0.35	F(2,31) = 0.93, *p* = 0.40
	OPN	6.29±1.21	1.70±0.47	0.05±0.26	F(2,31) = 0.52, *p* = 0.60
	LHb	16.72±1.99	0.99±0.40	1.55±0.08	F(2,31) = 0.08, *p* = 0.93
	MHb	2.75±0.71	2.18±0.53	1.55±0.36	F(2,31) = 2.62, *p* = 0.09
	SC	2.38±0.50	1.12±0.39	1.57±0.32	F(2,31) = 1.43, *p* = 0.26

ii) Zeitgeber Time

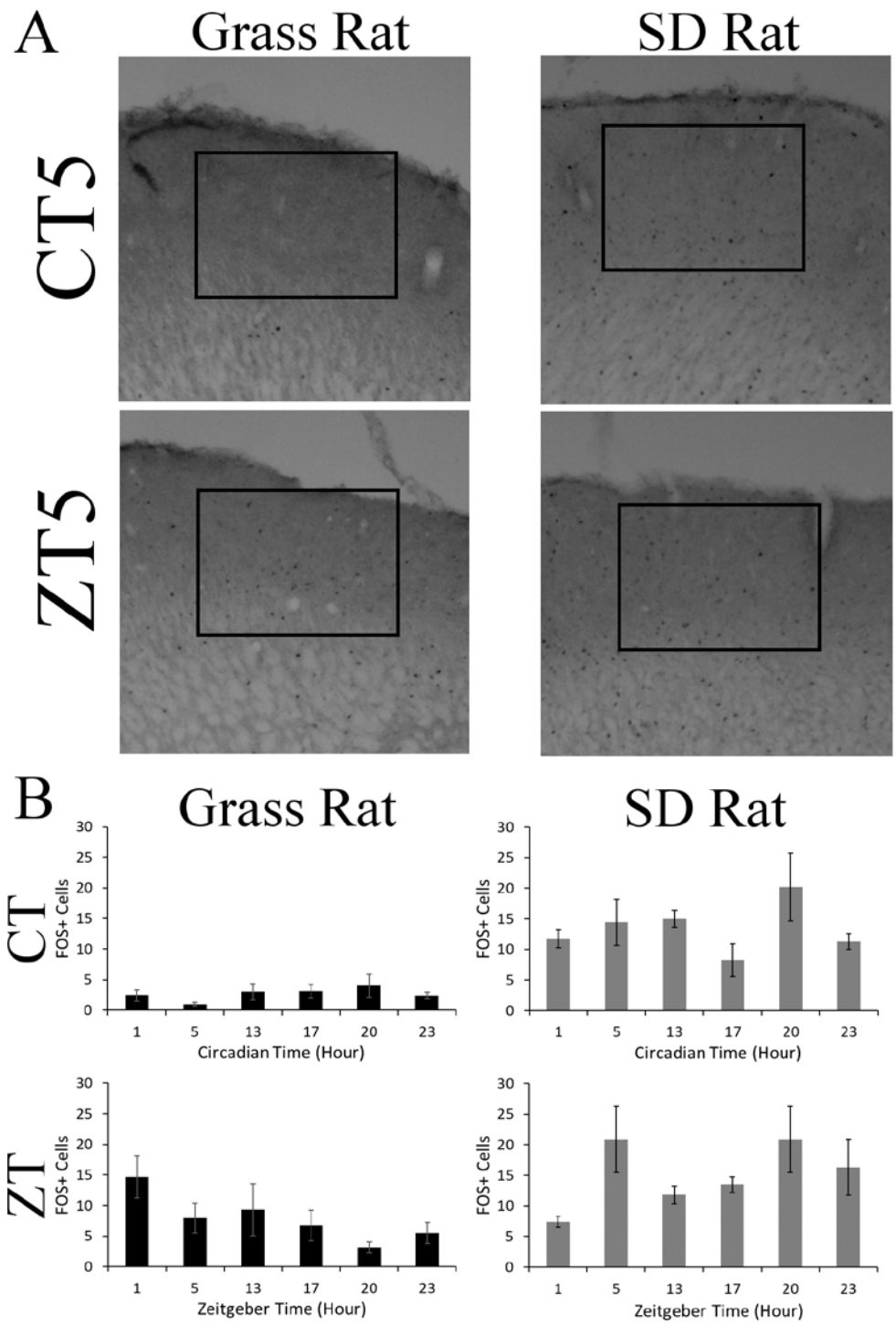
a) SD rat		**Mesor**	**Amplitude**	**Phase Angle**	**Cosinor Analysis**
	dLGN	38.70±4.47	10.68±1.49	1.29±0.37	F(2,29) = 1.24, *p* = 0.30
	IGL	**23.97±1.76**	**9.70±0.80**	**1.24±0.37**	**F(2,29) = 6.91, *p* = 0.004**
	vLGN	14.35±3.23	2.79±1.42	0.69±0.17	F(2,29) = 0.26, *p* = 0.77
	OPN	18.81±2.82	5.19±1.29	1.51±0.35	F(2,29) = 0.88, *p* = 0.43
	LHb	17.17±2.09	2.13±0.86	0.03±0.15	F(2,29) = 0.33, *p* = 0.72
	MHb	6.46±0.71	1.02±0.41	1.55±0.21	F(2,29) = 0.59, *p* = 0.56
	SC	15.11±2.04	0.49±0.16	0.001±0.05	F(2,29) = 0.15, *p* = 0.86
b) Grass Rat					
	dLGN	28.76±3.34	8.82±4.40	1.04±0.17	F(2,30) = 1.17, *p* = 0.32
	IGL	15.19±1.32	2.69±0.78	0.01±0.31	F(2,33) = 1.19, *p* = 0.32
	vLGN	4.73±1.22	2.08±1.06	0.94±0.03	F(2,33) = 1.00, *p* = 0.38
	OPN	8.35±1.33	4.07±0.54	0.18±0.37	F(2,34) = 2.05, *p* = 0.15
	LHb	**18.45±2.13**	**8.68±1.82**	**0.03±0.34**	**F(2,33) = 4.60, *p* = 0.02**
	MHb	**2.86±0.55**	**2.27±0.05**	**0.61±0.40**	**F(2,34) = 3.82, *p* = 0.03**
	SC	8.57±1.40	2.55±0.84	1.57±0.29	F(2,33) = 0.85, *p* = 0.44

Supplemental Material

Supplemental Table 1. Statistical Analysis of cFOS Activation during the Light Phase.

	Region	ME(Lighting)	ME(Time)	I(Lighting x Time)
a) Grass Rat	dLGN	F(1,20)=6.46	F(1,20)=5.66	F(1,20)=1.179
		p*=0.019	***p* =0.027***	*p* =0.291
	IGL	F(1,20)=4.22	F(1,20)=0.46	F(1,20)=1.17
		***p* =0.053#**	*p* =0.507	*p* =0.289
	vLGN	F(1,20)=0.97	F(1,20)=2.55	F(1,20)=0.40
		p =0.338	*p* =0.126	*p* =0.536
	OPN	F(1,20)=3.21	F(1,20)=0.003	F(1,20)=7.673
		p=0.089	*p*=0.960	***p* =0.012***
	SC	F(1,20)=17.61	F(1,20)=3.197	F(1,20)=1.36
		p*<0.001	*p*=0.090	*p*=0.257
	LHb	F(1,20)=2.19	F(1,20)=9.32	F(1,20)=2.36
		p=0.154	***p*<0.001***	*p*=0.140
	MHb	F(1,20)=0.15	F(1,20)=3.36	F(1,20)=0.20
		p=0.707	*p*=0.082	*p*=0.658
b) SD Rat	dLGN	F(1,16)=10.84	F(1,16)=6.40	F(1,16)=4.24
		p*=0.005	***p* =0.022***	***p* =0.056#**
	IGL	F(1,16)=54.57	F(1,16)=0.17	F(1,16)=1.69
		p* <0.001	*p* =0.688	*p* =0.212
	vLGN	F(1,16)=0.143	F(1,16)=1.581	F(1,16)=2.32
		p =0.710	*p* =0.227	*p* =0.147
	OPN	F(1,15)=17.23	F(1,15)=0.35	F(1,15)=0.427
		p*=0.001	*p*=0.562	*p* =0.523
	SC	F(1,15)=0.09	F(1,15)=5.02	F(1,15)=2.27
		p=0.770	***p*=0.041***	*p*=0.153
	LHb	F(1,16)=0.31	F(1,16)=1.99	F(1,16)=0.83
		p=0.588	*p*=0.178	*p*=0.375
	MHb	F(1,16)=0.23	F(1,16)=2.35	F(1,16)=1.75
		p=0.640	*p*=0.145	*p*=0.205

* indicates significant differences with $p<0.05$, # indicates a trend toward significance.



Supplemental Figure 1. cFOS activation in the superior colliculus. In SD rats expression levels are present at equal levels for both CT5 and ZT5 (A, right panel). In contrast, in grass rats, levels are low at CT5 but are increased in ZT5 (A, left panel). Examination of DD (B, top panel) and 12:12 LD conditions (B, bottom panel) do not show significant rhythms across the day for either species.