Parameter values for LHY/CCA1-TOC1-X Network			
Parameter Name	**Parameter Value**	**Parameter Description**	**Dimensions**
q1	12.2286	Coupling constant of light activation of LHY transcription	1/h
n1	9.4424	Maximum light-independent LHY transcription rate	nM/h
a	2	Hill coefficient of activation by X	
g1	2.0947	Constant of activation by protein X	nM
m1	8.0496	Maximum rate of LHY mRNA degradation	nM/h
k1	3.9155	Michaelis constant of LHY mRNA degradation	nM
p1	4.0188	Rate constant of LHY mRNA translation	1/h
r1	10.6578	Rate constant of LHY transport into nucleus	1/h
r2	1.0993	Rate constant of LHY transport out of nucleus	1/h
m2	2.1267	Maximum rate of cytoplasmic LHY degradation	nM/h
k2	0.2511	Michaelis constant of cytoplasmic LHY degradation	nM
m3	3.7925	Maximum rate of nuclear LHY degradation	nM/h
k3	8.4915	Michaelis constant of nuclear LHY degradation	nM
n2	3.4691	Maximum light-independent TOC1 transcription rate	nM/h
n3	1.2238	Maximum of light dependent activation of TOC1 transcription	1/h
b	2	Hill coefficient of repression by protein LHY	
g2	1.3859	Constant of repression by protein LHY	nM
m4	7.1075	Maximum rate of TOC1 mRNA degradation	nM/h
k4	2.2424	Michaelis constant of TOC1 mRNA degradation	nM
p2	2.1535	Rate constant of TOC1 mRNA translation	1/h
r3	0.6876	Rate constant of TOC1 movement into nucleus	1/h
r4	4.1674	Rate constant of TOC1 movement out of nucleus	1/h
m5	1.5743	Maximum rate of light dependent cytoplasmic TOC1 degradation	nM/h
m6	2.5529	Maximum rate of light independent cytoplasmic TOC1 degradation	nM/h
k5	1.8972	Michaelis constant of cytoplasmic TOC1 degradation	nM
m7	0.5879	Maximum rate of light dependent nuclear TOC1 degradation	nM/h
m8	0.9016	Maximum rate of light independent nuclear TOC1 degradation	nM/h
k6	2.6877	Michaelis constant of nuclear TOC1 degradation	nM
n4	2.6891	Maximum transcription rate of X mRNA	nM/h
c	2	Hill coefficient of activation by TOC1	
g3	1.9160	Constant of activation by TOC1	nM
m9	5.4578	Maximum rate of degradation of protein X mRNA	nM/h
k7	1.9433	Michaelis constant of protein X mRNA degradation	nM

Parameter Name	Parameter Value	Parameter Description	Dimensions
p3	2.4201	Rate constant of X mRNA translation	1/h
r5	2.0076	Rate constant of protein X movement into nucleus	1/h
r6	20.0848	Rate constant of protein X movement out of nucleus	1/h
m10	2.1119	Maximum rate of degradation of cytoplasmic protein X	nM/h
k8	5.2738	Michaelis constant of cytoplasmic protein X degradation	nM
m11	2.1795	Maximum rate of degradation of nuclear protein X	nM/h
k9	18.1832	Michaelis constant of nuclear protein X degradation	nM
p4	0.5	Light dependent production of protein P	nM/h
q2	1.0000	Coupling constant of light activation of protein P degradation	1/h
m12	1.2000	Miaximum rate of protein P degradation	nM/h
k10	1.2000	Michaelis constant of protein P degradation	nM

	WT period (h)	*cca1* Single mutant (h)	*cca1/lhy* mutant (h)
Experimental data (±1 S.E.M)	26.6 (±0.2)	25.4 (±0.2)	18.5 (±0.3)
Interlocked Feedback Model	25.9	25.5	17.0
LHY/CCA1-TOC1-X single loop model	25.9	29.5	Arrythmic
LHY/CCA1-TOC1 single loop model	25.0	29.2	Arrythmic

Parameter values for interlocked feedback loop network			
Parameter Name	Parameter Value	Parameter Description	Dimensions
q1	2.4514	Coupling constant of light activation of LHY transcription	1/h
n1	5.1694	Maximum light-independent LHY transcription rate	nM/h
a	3.3064	Hill coefficient of activation by protein X	
g1	0.8767	Constant of activation by protein X	nM
m1	1.5283	Maximum rate of LHY mRNA degradation	nM/h
k1	1.8170	Michaelis constant of LHY mRNA degradation	nM
p1	0.8295	Rate constant of LHY mRNA translation	1/h
r1	16.8363	Rate constant of LHY transport into nucleus	1/h
r2	0.1687	Rate constant of LHY transport out of nucleus	1/h
m2	20.4400	Maximum rate of cytoplasmic LHY degradation	nM/h
k2	1.5644	Michaelis constant of cytoplasmic LHY degradation	nM
m3	3.6888	Maximum rate of nuclear LHY degradation	nM/h
k3	1.2765	Michaelis constant of nuclear LHY degradation	nM
n2	3.0087	MaximumTOC1 transcription rate	nM/h
b	1.0258	Hill coefficient of activation by protein Y	
g2	0.0368	Constant of activation by protein Y	nM
g3	0.2658	Constant of repression by LHY	nM
c	1.0258	Hill coefficient of repression by LHY	
m4	3.8231	Maximum rate of TOC mRNA degradation	nM/h
k4	2.5734	Michaelis constant of TOC mRNA degradation	nM
p2	4.3240	Rate constant of TOC1 mRNA translation	1/h
r3	0.3166	Rate constant of TOC1 movement into nucleus	1/h
r4	2.1509	Rate constant of TOC1 movement out of nucleus	1/h
m5	0.0013	Maximum rate of light dependent cytoplasmic TOC1 degradation	nM/h
m6	3.1741	Maximum rate of light independent cytoplasmic TOC1 degradation	nM/h
k5	2.7454	Michaelis constant of cytoplasmic TOC1 degradation	nM
m7	0.0492	Maximum rate of light dependent nuclear TOC1 degradation	nM/h
m8	4.0424	Maximum rate of light independent nuclear TOC1 degradation	nM/h
k6	0.4033	Michaelis constant of nuclear TOC1 degradation	nM
n3	0.2431	Maximum transcription rate of protein X	nM/h
d	1.4422	Hill coefficient of activation by TOC1	

Parameter Name	Parameter Value	Parameter Description	Dimensions
g4	0.5388	Constant of activation by TOC1	nM
m9	10.1132	Maximum rate of degradation of protein X mRNA	nM/h
k7	6.5585	Michaelis constant of protein X mRNA degradation	nM
p3	2.1470	Rate constant of X mRNA translation	1/h
r5	1.0352	Rate constant of protein X movement into nucleus	1/h
r6	3.3017	Rate constant of protein X movement out of nucleus	1/h
m10	0.2179	Maximum rate of degradation of cytoplasmic protein X	nM/h
k8	0.6632	Michaelis constant of cytoplasmic protein X degradation	nM
m11	3.3442	Maximum rate of degradation of nuclear protein X	nM/h
k9	17.1111	Michaelis constant of nuclear protein X degradation	nM
q2	2.4017	Coupling constant of light activation of Y mRNA transcription	1/h
n4	0.0857	Light dependent component of Y transcription	nM/h
n5	0.1649	Light independent component of Y transcription	nM/h
g5	1.1780	Constant of repression by TOC1	nM
g6	0.0645	Constant of repression by LHY	nM
e	3.6064	Hill coefficient of repression by TOC1	
f	1.0237	Hill coefficient of repression by LHY	
m12	4.2970	Maximum rate of degradation of protein Y mRNA	nM/h
k10	1.7303	Michaelis constant of protein Y mRNA degradation	nM
p4	0.2485	Rate constant of Y mRNA translation	1/h
r7	2.2123	Rate constant of protein Y movement into nucleus	1/h
r8	0.2002	Rate constant of protein Y movement out of nucleus	1/h
m13	0.1347	Maximum rate of degradation of cytoplasmic protein Y	nM/h
k11	1.8258	Michaelis constant of cytoplasmic protein Y degradation	nM
m14	0.6114	Maximum rate of degradation of nuclear protein Y	nM/h
k12	1.8066	Michaelis constant of nuclear protein Y degradation	nM
p5	0.5000	Light dependent production of protein P	nM/h
k13	1.2000	Michaelis constant of protein P degradation	nM
m15	1.2000	Miaximum rate of protein P degradation	nM/h
q3	1.0000	Coupling constant of light activation of protein P degradation	1/h