

Clock Genes in Animals

Update: 2009.3.16

Genome projects: C, complete; D, draft; P, in progress.		C	C	D	P	P	P	D	D	D	D	D	C	C	D	D
Domain, Function	Gene name HUGO [Synonym] (fly)	<i>Homo sapiens</i>	<i>Mus musculus</i>	<i>Gallus gallus</i>	<i>Xenopus tropicalis</i>	<i>Xenopus laevis</i>	<i>Danio rerio</i>	<i>Ciona intestinalis</i>	<i>Branchiostoma floridae</i>	<i>Strongylocentrotus purpuratus</i>	<i>Apis mellifera</i>	<i>Anopheles gambiae</i>	<i>Drosophila melanogaster</i>	<i>Caenorhabditis elegans</i>	<i>Nematostella vectensis</i>	<i>Trichoplax adhaerens</i>
bHLH PAS	PER (<i>period</i>)	3	3	2	3	2	4	0	1	0	1	1	1	1	0	0
	CLOCK , NPAS2 ^a	2	2	2	2	1	3	0	1	1	1	1	1	0	1	0
	ARNTL [BMAL] (<i>cycle</i>)	2	2	2	2	1	3	0	1	1	1	1	1	0	1	0
bHLH Orange	BHLHE40,41 [DEC1, 2]	2	2	1	2	1	2	0	1 ^b	0	0	0	0	0	0	0
	(<i>cwo</i>)	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0
HLH	Id1-4	4	4	4	3	3	5	0	1	1	1	1	1	0	1	0
bZIP	NFIL3 [E4BP4] (<i>vriille</i>)	1	1	1	1	1	1	2	1	1	1	1	1	1	0	0
	DBP , HLF (<i>Pdp1</i>) ^c	3	3	2	2	1	5	1	3	3	2	2	4	3	5	3
Nuclear receptor	NR1D1, 2 [REV-ERB]	2	2	1	1	1	5	1	1	1	1	1	1	1	0	0
	RORA , <i>B, C</i> [NR1F1-3]	3	3	2	3	1	5	1	1	1	1	1	1	1	0	0
SIR2	SIRT1-7	7	7	7	7	7	7	7	7	7	7	4	5	2	7	8
photolyase FAD bind	CRY ^d	2	2	2	1	1	5	0	1	1	1	1	0	0	1	0
	(<i>cry</i>) ^e	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0
	PHOTOLYASE ^f	0	0	2	3	3	3	1 ^g	2	1	0	2	2	0	1 ^h	2 ^g
	CRY-DASH ^f	0	0	0	1	1	1	0	0	1	0	0	0	0	1 ^h	0
	(<i>timeless</i>) ⁱ	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0
Kinase	GSK3 (<i>shaggy</i>)	2	2	1	2	2	4	1	1	1	1	1	1	1	1	1
	CSNK1 (<i>dco/dbt</i>)	7	7	4	7	6	8	1 ⁱ	5	4	3	3	3	3	4	3
	CSNK2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
F-box (Ubi-ligase)	BTRC [FWD1](<i>slimb</i>)	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1
	FBXL3 , 21 [<i>overtime, after-hours</i>]	2	2	2	1	1	3	0	1	1	1	0	0	0	0	0
	FBXL15 (<i>jetlag</i>)	1	1	1	1	1	1	0	0	1	0	1	1	0	1	0

2 1 0 Numbers in cells indicate the number of homologs found in the species. (ex., *Rora*, *Rorb*, *Rorc* = 3)

3 Purple cells: Loss-of-function mutant is arrhythmic and viable.

3 Red cell: Behavioral rhythm was altered in animal model.

3 Yellow cell: Clock function was reported in cultured cell.

3 Blue cell: Homolog was found. Clock function is unknown or normal behavioral rhythm in animal model.

Gene name was shown basically according human official symbol by [HGNC](#). Synonym was put in brackets: [synonym]. Gene name for *Drosophila* was put in parentheses: (fly gene).

Footnotes: **a.** *NPAS2* was regarded as a paralogue of the *CLOCK*. **b.** The sequence cannot be classified as *DEC* and *cwo*. **c.** Numbers include *giant* and *ces-2* like sequences. **d.** Mammalian type *CRY*. **e.** Insect type *CRY*. **f.** 'Non-clock' family was listed for reference. **g.** Bacterial *PHR* like. **h.**

Additional four *PHR*, *CRY-DASH* like sequences were found. **i.** Vertebrate type *TIMELESS* was classified as *timeout* and omitted from this list. *timeout* was found in all animals (→ [timeless homolog list](#)).

j. *CSNK1A*