A shoot-to-root signalling allows long-distance circadian clock synchronization.

Light influences clock by:
(i) affecting transcription
(ii) regulating RNA stability
(iii) controlling translation rate.

Modulation of some clock elements is tissue specific.

30% of the genes expressed in shoots are circadian clock-regulated.

Reviewed in Hsu et al., 2014

Light influences clock by:
(i) affecting transcription
(ii) regulating RNA stability
(iii) controlling translation rate.

Exposure pattern of circadian clock genes in shoots

Data from James et al., 2008

Other processes controlled by the circadian clock

Central genes

Central genes

Other circadian clock regulators

Other circadian clock regulators

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HYPOCOTYL LENGTH

LONG HYPOCOTYL
- elf3
- toc1
- prr7
- prr9
- CCA1ox
- LHY ox

SHORT HYPOCOTYL
- lhy
- cca1

FLOWERING TIME

EARLY FLOWERING
- cca1
- elf3
- lhy
- toc1
- lwd1
- lwd2

LATE FLOWERING
- gi
- prr5
- prr7
- prr9
- CCA1ox
- LHY ox
- PRR3 ox

OTHER PROCESSES CONTROLLED BY THE CIRCADIAN CLOCK

MORNING GENES
- CCA1
- LHY
- CKB3
- TIC

EVENING GENES
- PRR9
- PRR7
- LWD1/2
- CKB4

OTHER CIRCADIAN CLOCK REGULATORS
- FIO1
- LNK1
- SRR1
- LNK2

INPUTS & OUTPUTS

MUTANTS & OVEREXPRESSORS

TIME-COURSE GENE EXPRESSION

Adapted from Nagel and Kay., 2012
WWW.FLOR-ID.ORG
GROWTH PROCESSES CONTROLLED BY THE CIRCADIAN CLOCK

- GERMINATION
- HYPOCOTYL GROWTH
- SHADE AVOIDANCE
- FLOWER OPENING FOR POLLINATION
- LEAF MOVEMENT

CELLULAR PROCESSES CONTROLLED BY THE CIRCADIAN CLOCK

- STOMATA OPENING
- PHOTOSYNTHESIS
- SUGAR METABOLISM & TRANSPORT
- COLD RESPONSE
- RESPONSE TO PATHOGENESIS

Processes reviewed in Yakir et al., 2007

OTHER PROCESSES CONTROLLED BY THE CIRCADIAN CLOCK

OTHER CIRCADIAN CLOCK REGULATORS

LOCATIONS

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