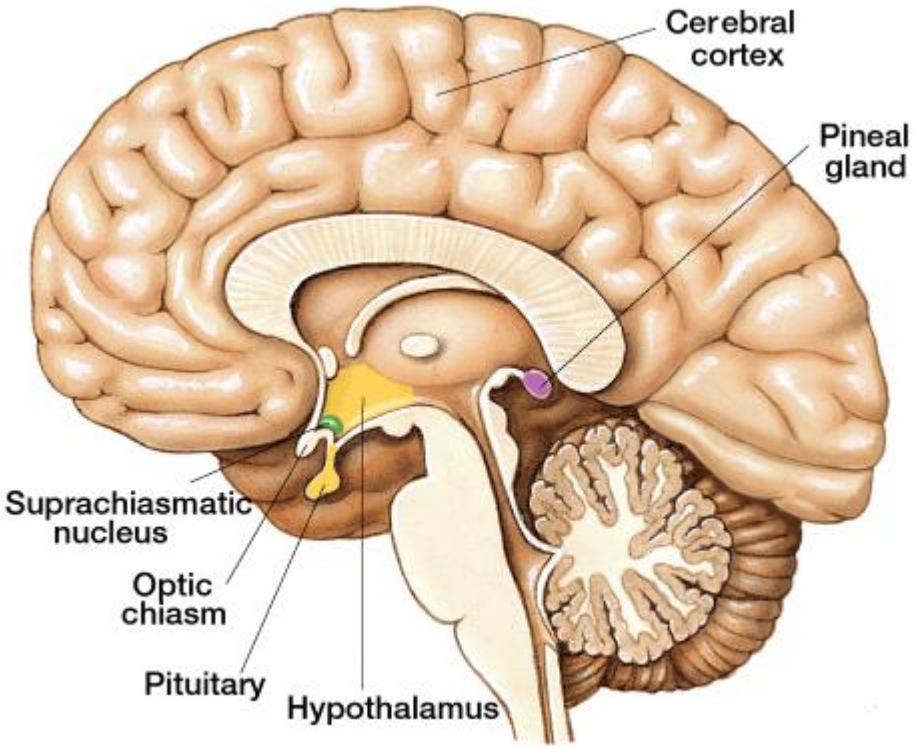
Suprachiasmatic nucleus SCN

Tiny region located in the hypothalamus, situated directly above the optic chiasm. It is responsible for controlling circadian rhythms. The neuronal and hormonal activities it generates regulate many different body functions in a 24-hour cycle, using around 20,000 neurons.



The SCN interacts with many other regions of the brain. It contains several cell types and several different peptides (including vasopressin and vasoactive intestinal peptide) and neurotransmitters.

The basic components and the ability to generate a circadian rhythm are also characteristic of most peripheral tissues and some cell lines.

The rat C6 glioma cell line displays circadian oscillations of reporter luciferase bioluminescence driven by the mouse PER2 promoter and of clock-related gene transcripts. Per2::luc expressing C6 cells display circadian rhythm in their bioluminescence levels for more than seven days. In addition, clock and clock-controlled genes show dynamic circadian oscillation in C6 cells after exposure to dexamethasone. It is also significant that Per1 is not induced in C6 cells by a calcium ionophore, which is in stark contrast to Rat-1 cells. The C6 glioma cell line has therefore the potential to be a useful tool in future investigations of the underlying molecular machinery of the circadian clock [1].

1)
Fujioka A, Takashima N, Shigeyoshi Y. Circadian rhythm generation in a glioma cell line. Biochem Biophys Res Commun. 2006 Jul 21;346(1):169-74. Epub 2006 May 24. PubMed PMID: 16750513.