Biological clock

BIOLOGICAL CLOCK

- An internal system that controls an organism's circadian rhythms, the cycles of behavior that occur regularly in a day.
- In mammals, the biological clock is located near the point in the brain where the two optic nerves cross.
- The progression or time period from puberty to menopause, marking a woman's ability to bear children.

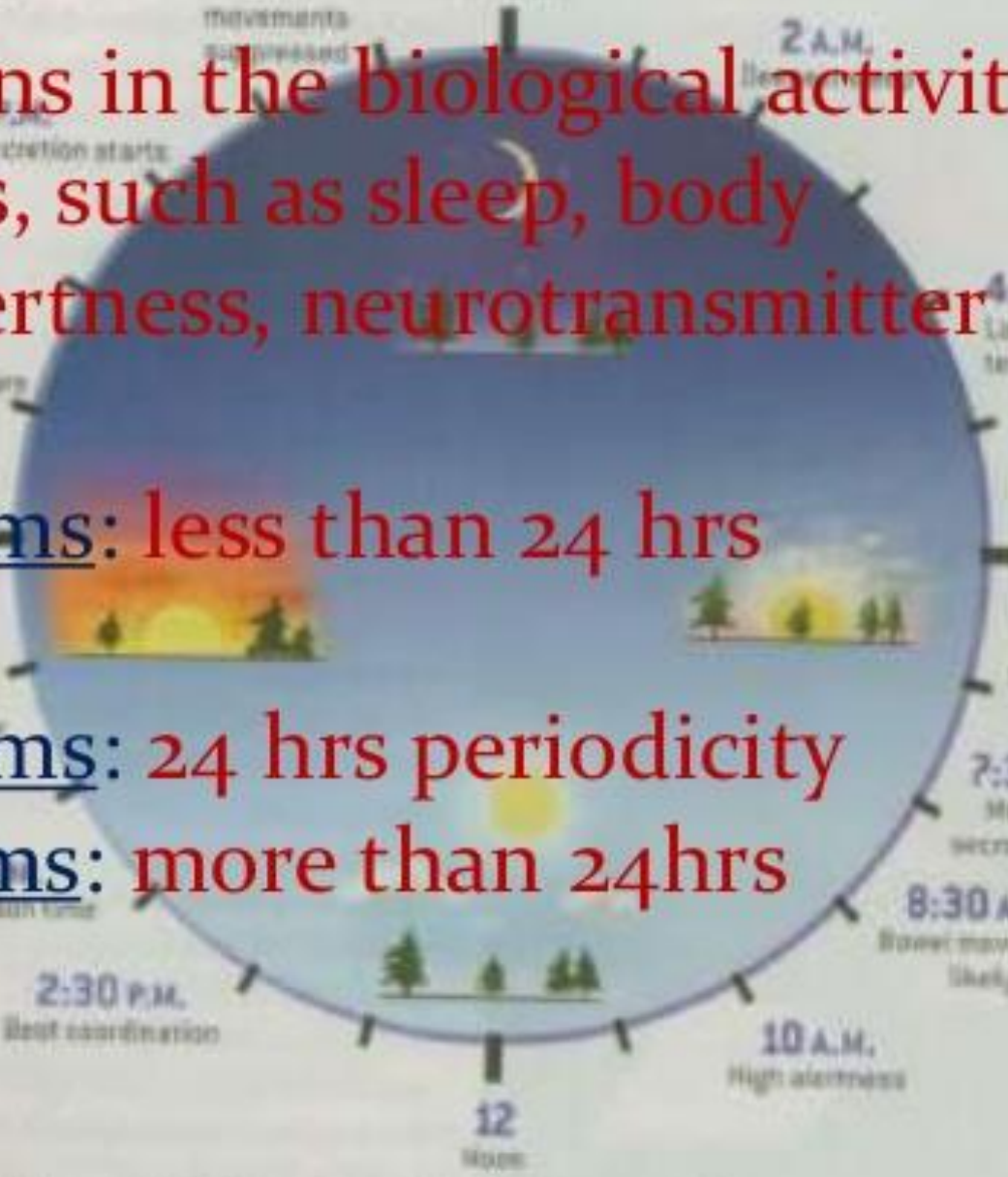
TYPES OF BIOLOGICAL CLOCK

Regular variations in the biological activity of living organisms, such as sleep, body temperature, alertness, neurotransmitter levels, etc.

Ultradian rhythms: less than 24 hrs periodicity

Circadian rhythms: 24 hrs periodicity

Infradian rhythms: more than 24hrs periodicity



Infradian rhythms

Seasonal affective disorder (SAD): Seasonal changes in behaviour can also be found in human beings. Individuals feel depressed during winter, and elated during summer. One suggestion is that absence of light increases melatonin

Ultradian rhythm

Shorter than 24 hrs, such as smoking, eating and drinking, renal excretion (discharging waste through kidneys), sleep

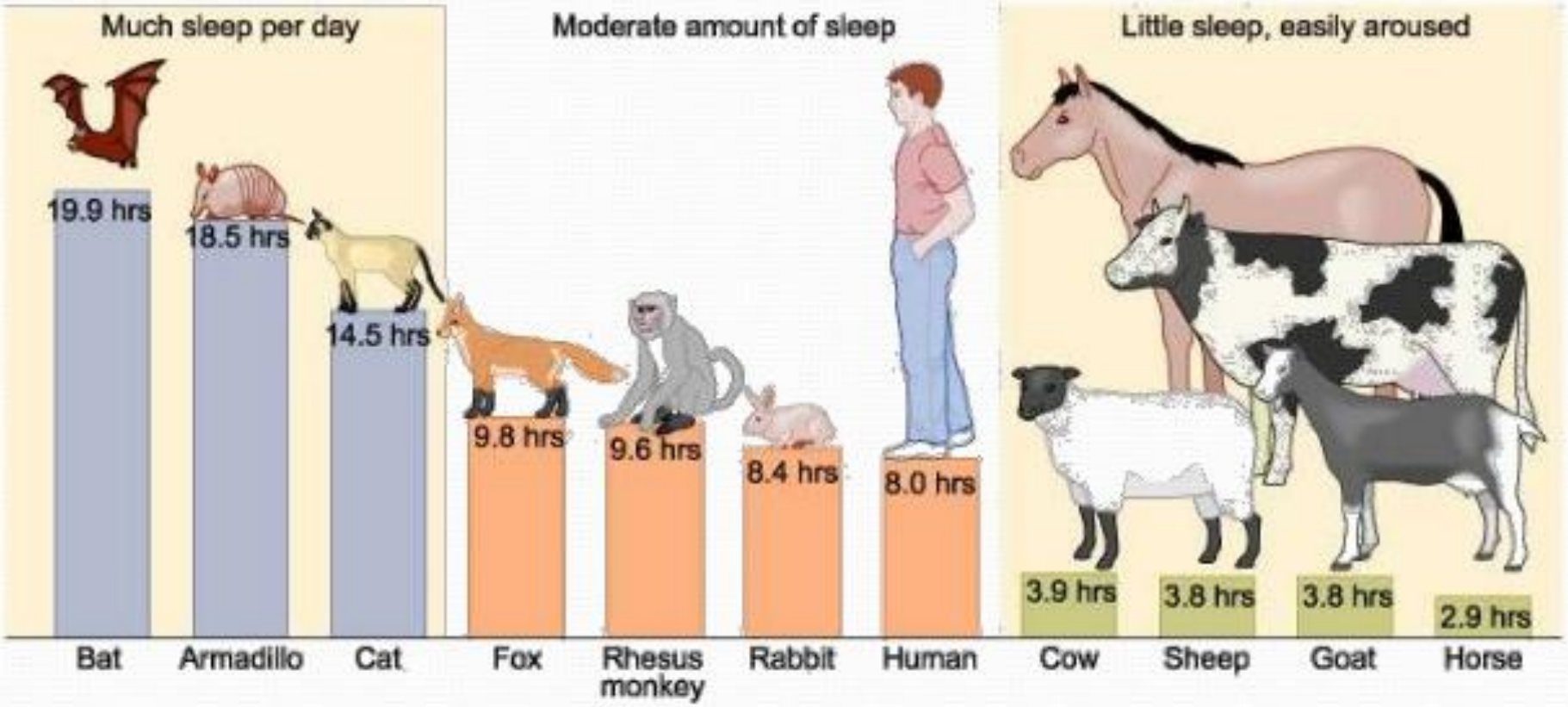
CIRCARDIAN RHYTHMS

Examples: sleep/waking, body temperature

Circadian rhythms are needed to balancing behaviour and body states to environmental changes.

SLEEPING TIME

Compared to other animals, humans sleep a moderate amount of time.



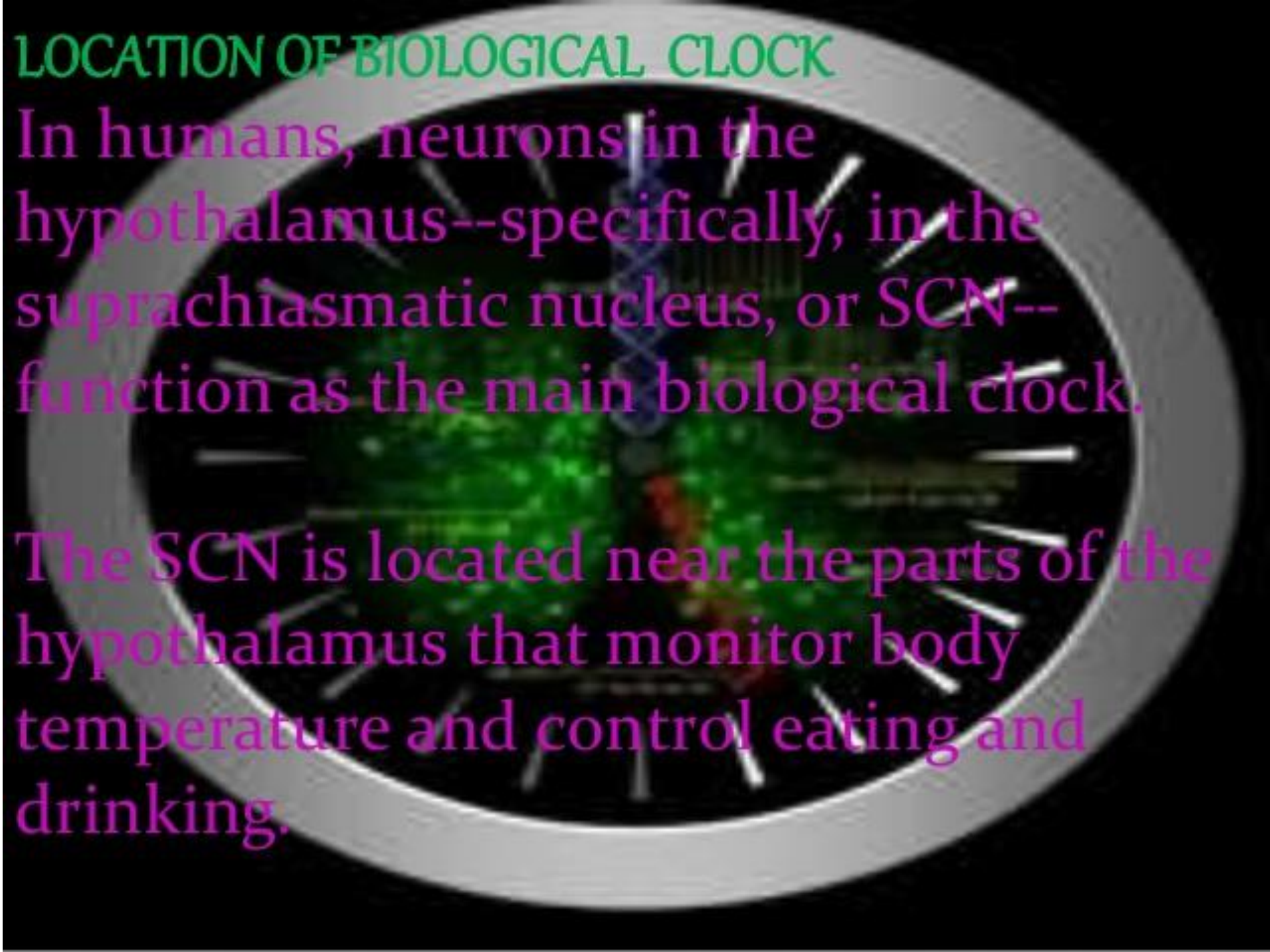
ROLE OF BIOLOGICAL CLOCK IN MENSTRUATION

The Menstrual Cycle -an example of an Infradian Rhythm, is controlled by hormones oestrogen and progesterone.

LOCATION OF BIOLOGICAL CLOCK

In humans, neurons in the hypothalamus--specifically, in the suprachiasmatic nucleus, or SCN--function as the main biological clock.

The SCN is located near the parts of the hypothalamus that monitor body temperature and control eating and drinking.



PROCEDURE OF BIOLOGICAL CLOCK

Thought mainly to be an endogenous (internal) mechanism

- Our internal rhythms are thought to be generated by **protein synthesis** within the **SCN**. Protein is produced for a period of hours until it reaches a level that inhibits further production. Over the next few hours the protein level gradually falls, when it drops to a certain 'threshold' level then production of the protein re-starts. This generates an internal (endogenous) biological rhythm – in humans of between 24 ½ and 25 hours.

IMPORTANCE OF BIOLOGICAL CLOCK

- It plays a vital role in our body. It not only determines our sleep and waking patterns, but alsoensures that almost all processes in our body.
- The efficacy of drugs or the effect of toxic substances can be affected by the biological clock.
- It can also be found in the cells of our body which means that, depending on the time of day, our body is more sensitive or less sensitive to certain substances
- The biological clock turns out not only to regulate sleeping and waking but also the functions connected with reproduction

CONCLUSION

- The ability to measure time is an innate property of the cell Wherever the fundamental nature of biological clock has not been fully explored feed back regulation of enzyme activation and inhibition ionic diffusion have all been proposed as possible mechanisms .
- Now a days interaction between cellular clock with in multi cellular organism have been studied the concept of master clock has also emerged never the less certain group of cells such as those in the optic lobes of the brain are better placed than other to entrain with environmental cycles of light and darkness.
- These might be expected to become the modified version of Biological clock.