

BIOLOGICAL CLOCKS

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INTRODUCTION

- ⦿ There is a built in clock inside our body which regulates sleep-wake timing.
- ⦿ It has been established that all organisms possess an innate biological clock. (Pittendrigh 1960)
- ⦿ Biological Clocks are also known as **Internal clocks** or **Circadian rhythms**.

DEFINITION

- ◉ In earlier times the most outstanding work on biological clocks was done by **Erwin Banning** in 1936 he proposed that organisms have an inbuilt and nearly automatic rhythm which repeats itself at about 24 hours interval and these rhythms are used to measure time.
- ◉ Biological rhythms are internal mechanisms in the living beings.

CIRANNUAL CLOCK

- The activity of animals influenced by the **season** occurring once in an year remain under the control of circannual clocks.
- Migratory Birds follows circannual clocks.

CIRCATIDAL CLOCKS

- The biological rhythm synchronizes with the low and high tides (the alternate rise and fall of the sea due to gravitational pull exerted by moon) in the sea are called **Circatidal Clocks**.
- Some Invertebrates shows the circatidal clocks. Eg. Planaria, Molluscs, Polychaetes, Echinodermates etc.

CIRCALUNAR OR CIRCASYNODIC CLOCKS

- ⦿ Biological Clocks which are synchronized with the moon phases are called **Circlunar** or **Circasynodic** clocks.
- ⦿ Examples: Invertebrates

SEMILUNAR OR CIRCASYGIC CLOCKS

- The biological rhythms or biological clocks which are synchronized with the fortnightly cycle of spring tide (high tide occurring a day or two after the new or the full moon) and **neap tide** (low tide which occurs in the middle of the second and fourth quarters of the moon) are known as **Semilunar Clocks**.
- It shows distinct 15 day periodically.

CIRCADIAN CLOCKS

- ⦿ Operating on an approximately 24 hour basis, they are the most studied and best understood biological clocks and are found in almost all the major taxonomic groups of animal kingdom.
- ⦿ Some animals are active in Nocturnal and some are in Diurnal. Eg. Bat and Birds
- ⦿ Control of biological rhythms by pineal hormones.

CONCLUSION

- About 300 yr. before Aristotle and 1880 Darwin noted rhythms in many animals .
- Biological rhythms are self -sustaining natural cycles of animal life history which maintain themselves regardless of the environmental factors.
- Biological clock are time management activities of animal behaviour in rhythms of life .