

Q1: Compare A to B. What is the experimental manipulation? Why do the results of this experiment provide evidence that animals must have an internal time-keeping mechanism ("clock")? What other variables might need to be controlled in this experiment to increase the evidence for this conclusion?

Q2: Think about the difference between an animal's activity budget as a function of the time of day versus the activity budget as constant throughout the day? Based on the paper you read for class, compare the approximate activity budget among stridulation and locomotion across: a) the whole day versus b) day or night.

Q3: What experimental comparisons and data (from Figure 67) provide evidence that there must be a biological mechanism that entrains the circadian clock?

Q4: Where in the cricket brain is the circadian clock located? What is your evidence for this (based on the experiment shown in Figure 67)?

Q5: Do midshipman fish have an endogenous clock for humming behavior? What is the evidence?

Q6: What activity pattern would you predict in constant light conditions?

Q7: Does the hormone melatonin have an excitatory or inhibitory effect on humming behavior? What is the evidence?

Q8: Under DD conditions, the fish exhibited free-run hum activity (Figure 72, see margin). However, under LL conditions, the fish now exhibited what kind of activity pattern?

Q9: Can you think of any reasons why an endogenous circadian pattern of humming was not recovered in the experimental group (Figure 73C)?