

9.01 Study Questions
Lecture 24

1. How can you be certain that the sleep-wake cycle is controlled by an endogenous rhythm and not by periodic signals coming from outside the organism?
2. What is the “biological clock” in mammals, and where is it located? Is there only one such clock?
3. Why do we sleep? Is sleep necessary? If so, for what? How much sleep is needed? What may be the reason(s) that infants sleep so much more than adults, with a much greater percentage of time spent in REM sleep?
4. The circadian cycle of activity in single neurons in the suprachiasmatic nuclei of the hypothalamus results from interacting transcription and translation feedback loops. The *Per* genes are involved. How can the cycles of *Per* gene activity be seen? What causes “splitting” of the activity cycle in some hamsters that are maintained in constant lighting conditions?
5. How were the various stages of sleep discovered? What are the major types of sleep, and what are their main characteristics? Do EEG recordings always correlate with behavioral states of arousal?
6. What is meant by “autonomic dysregulation” and when does this occur normally? What are some symptoms of this dysregulation?
7. Define: REM, EEG, EOG, EMG.
8. Is REM sleep essential for sanity? What functions of this type of sleep have been proposed?
9. What is sleep apnea?
10. What is narcolepsy and what is the “cataplexy” that occurs in some narcoleptics?
11. In what kind of sleep do the following occur: nightmares, night terror, sleepwalking (somnambulism).
12. What is hypnagogic imagery (hypnagogic hallucination)?