

## **9.14**

### **Classes #24-25: Auditory and related sensory systems**

**Monday April 4, Wednesday April 6.**

#### *Readings:*

Allman ch 5 pp 98-101 on “the first mammals” (again)

Striedter ch 8 pp (225-258), 259-268, (268-287). “What’s special about mammal brains?” Also, study figure 8.10 on p282.

Striedter ch 5 pp 154-157 (On mosaic evolution in medulla: electrosensory system)

Striedter ch 5 pp162-171 (Focus on what is written about avian song systems and on the auditory parts of the midbrain.)

Additional reference, not assigned: Butler & Hodos ch 11, section on “Dorsolateral cranial nerves: lateral line and octaval systems” pp 148-152; ch 28, “Auditory and vocal forebrain in amniotes” pp 410-421)

#### *Questions on readings: Allman, supplemented by Striedter.*

1. According to fossil evidence, what major transformation of the hearing apparatus occurred in early mammals?
2. What is believed to be the functional advantage of this transformation? How are the outer hair cells, another feature unique to mammals, involved?
3. Why does Allman think that these innovations were linked to developments in parental care, which was related to evolution of temperature homeostasis?

#### *Questions on readings: Striedter ch 8*

4. It is likely that early mammals were nocturnal. This would promote the evolution of olfaction and audition. What skull feature supports the idea of an innovation in the hearing apparatus just prior to evolution of mammals?
5. What brains of extant species probably resemble the brains of very early mammals?

#### *Questions on readings: Striedter ch 5*

6. What are the functions of the facial and vagal lobes of teleost fish, used by Striedter as examples of mosaic evolution?

7. What is the even more spectacularly enlarged hindbrain system in Mormyrid fish? What are the two structures most affected?
8. Describe the correlation between structural size of the Higher Vocal Center in songbirds and function.
9. How do the sizes of the superior and inferior colliculi of the midbrain vary among mammals?