

9.14 Spring 2005
Homework No. 3
Due date: April 25, 2005 (Monday)

You should read pp. 185-197 of Striedter before attempting question No. 1, and pp. 259-268 of Striedter before answering question No. 2. Question No. 3 would require some synthesis of the many book chapters you have read in this course.

1. Striedter cited the conversion of an unlaminated brain region into a laminated one as an example of “phylogenetic conversion” – the evolution of a “novel” structure by modifying a pre-existing structure, established by clear one-to-one homology across species.
 - a. Give two examples of laminated brain regions from two different species.
 - b. Why is lamination relatively “easy” to be evolved?
 - c. What potential benefit(s) can lamination confer to an organism?
2. As discussed by Striedter, early mammals were probably nocturnal so that they could avoid competing with the exothermic reptiles active during the day. How are the visual, olfactory, and auditory systems of these early mammals different from those of birds and reptiles, thereby allowing them to survive better in a nocturnal environment?
3. Both Striedter and Allman cited many fossil studies throughout their presentations. In what ways can examinations of fossil records of bones illuminate evolution of brain structures? You can cite specific example(s).

Try to limit your response to each to a maximum of 1 page (or even shorter).