

9.14 Homework No. 4 (Optional extra credit and makeup)

Due date: On or before Friday, May 20, 2005

You should read Streidter, chapter 9 (pp. 297-344) before attempting questions 1-4, and Allman, chapter 7 (pp. 160-208), before attempting questions 5-6.

If you need to make up for one quiz, you should do any 3; if you need to make up for two quizzes, you should do any 4. You are welcome to do any number of questions for additional credits.

1. In his book chapter on what is special about human brains, Streidter emphasizes the evolutionary costs entailed for the great expansion of the human brain. Describe these costs. You may illustrate them with specific examples. (At least three such costs are outlined in the Streidter chapter; one additional cost is mentioned in Allman chp. 7).
2. What is convergent evolution? Give two such examples. (In Chapter 9 of Streidter, there are at least three such examples cited).
3. What features specific to the human brain might be related to the emergence of language, a uniquely human trait?
4. What is the theory of punctuated equilibrium in evolution? Illustrate this theory using the evolution of hominin brain size from early australopithecines to *Homo sapiens* as an example.
5. Allman showed that fruit-eating and leaf-eating primates have different relative brain sizes. How might this difference be related to differences in their energy budgets?
6. Wolves are believed to be ancestral to dogs; but the size of a dog brain is only about three quarters of the size of a wolf brain (after body weight correction). Discuss this decrease of brain size from wolves to dogs in relation to human domestication of these animals.

Try to limit your response to each question to a maximum of one page (11 points, 1.5 space).