

9.14

Classes #19-20: Taste and olfactory systems **Wednesday March 16; Friday March 18, 2005**

Readings:

Per Brodal ch. 10, Olfaction and taste, pp.233-239.

Striedter ch 5 on concerted and mosaic evolution, pp 137-153. (Remainder of chapter will be assigned later.)

S. Ramon y Cajal (orig. French ed. 1909; trans. English edition 1995) *Histology of the Nervous System, vol. 2*. Trans. N. Swanson and L. W. Swanson. Oxford Univ. Press. [See drawings in chapters 28-30.] -----Selected figures available on web site-----

Lois, C., Garcia-Verdugo, J.-M., Alvarez-Buylla, A. (1996) Chain migration of neuronal precursors. *Science* 271: 978 - 981.

(Alvarez-Buylla, A. and Garcia-Verdugo, J.M. (2002) Neurogenesis in adult subventricular zone. *J. Neurosci.* 22: 629-634.)

(Malnic, B., Hirono, J., Sato, T., and Buck, L. (1999) Combinatorial receptor codes for odors. *Cell* 96: 713-723.)

Questions on readings: Brodal

1. What is a glomerulus (plural: glomeruli)? What are the major components of the olfactory glomeruli in the olfactory bulb?
2. Where is the uncus? What kind of structure is it?
3. Describe one phenomenon of "olfactory imprinting".
4. Describe the pathway for taste impulses, from tongue to neocortex.

Questions on readings: Striedter

5. Contrast concerted and mosaic evolution.
6. How much of the variation, across different species of mammals, in the size of neocortex, and also other major brain regions, can be predicted from absolute brain size?
7. Explain the meaning of "late equals large", as a summary of the interpretive work of Finlay and Darlington. (Note: Barbara Finlay, of Cornell University, did her graduate work at MIT under Professors Schneider and Schiller.)
8. Is the "late equals large" rule always followed? I.e., to what extent do some structures evolve mosaically? Give specific examples. (Examples have been shown in class. Give at least one additional example, from Striedter.)

Questions on readings: Lois et al.

9. How can one prove the existence of neuronal precursors in the adult mammalian brain?
10. Describe the migration route of such cells. What guides the cells?