

**Lecture VII. CNS Patterning**

Bio 3411  
Wednesday  
September 16, 2009

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**Reading**

THE BRAIN ATLAS: p 10

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**Selected References:**

<sup>†</sup> Benito-Gutierrez, E., & Arendt, D. (2009). CNS evolution: new insight from the mud. *Curr Biol*, 19(15), R640-642.

Hamilton, W. J., Boyd, J. D., & Mossman, H. W. (1972). *Hamilton, Boyd and Mossman's human embryology: prenatal development of form and function* (4th ed.). Cambridge.: Heffer.

<sup>†</sup>Hartenstein, V. (1993). Atlas of Drosophila Development.

Kandel, E. R., Schwartz, J. H., & Jessell, T. M. (2000). *Principles of neural science* (4th ed.). New York: McGraw-Hill, Health Professions Division. Chapter 52, pp 1019-1040.

<sup>†</sup>Puelles, L. (2009). *Forebrain Development: Prosomere Model. in: New Encyclopedia of Neuroscience*. Amsterdam: Elsevier.

Ranson, S. W., & Clark, S. L. (1959). *The anatomy of the nervous system; its development and function* (10<sup>th</sup> ed.). Philadelphia.: Saunders.

<sup>†</sup> Posted on web site.

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**What the last Lecture was about**

- General mechanisms for assembling neurons and groups of neurons
- Diffusion vs Contact
- Attraction vs Repulsion
- Examples of impacts of contact
- Examples of impacts of diffusion
- Specification by growth factors
- The chemoaffinity hypothesis

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**What this Lecture is about**

- The Initiation of the Central Nervous System
- CNS Growth and Pattern Development
- Bug Brains
- Several Mechanisms for Directing the Show (scripts conserved)
- How did vertebrate and invertebrate patterns arise?

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## Recap of Early Embryogenesis

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A      B      C      D      E

Ranso & Clark (1959)

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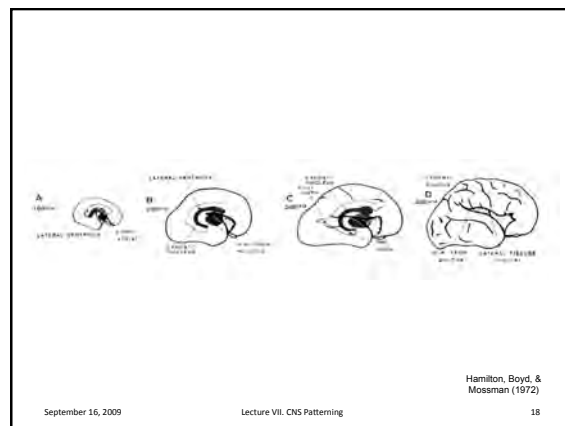
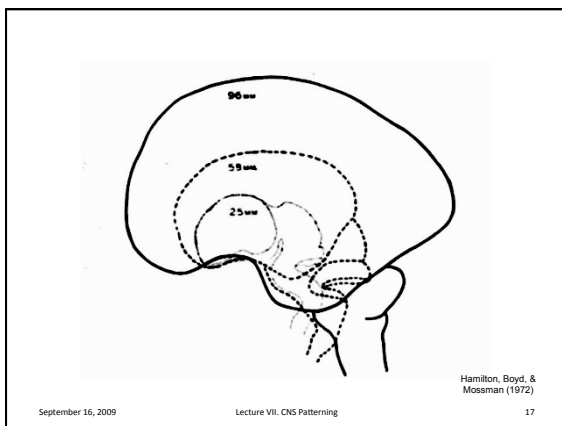
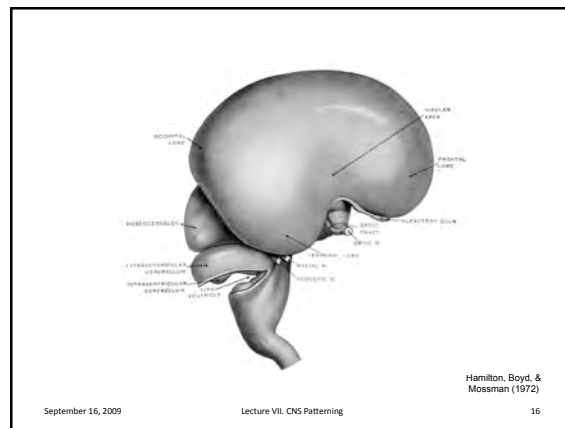
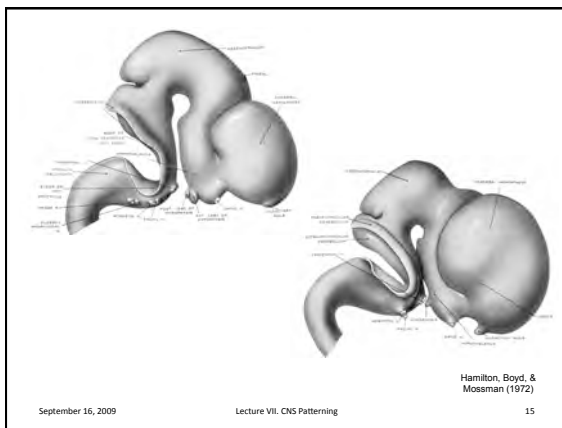
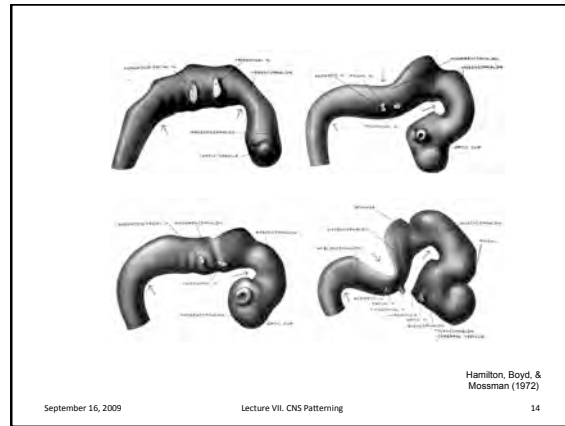
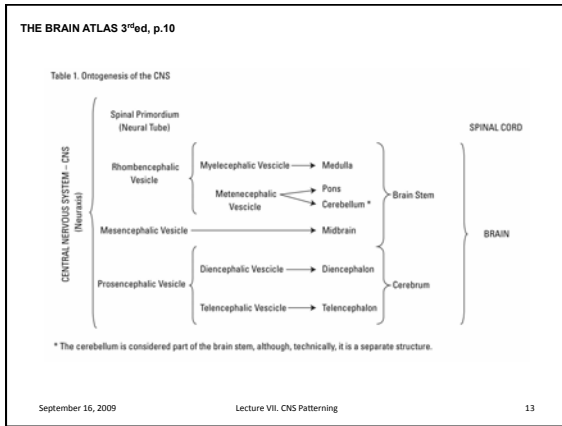
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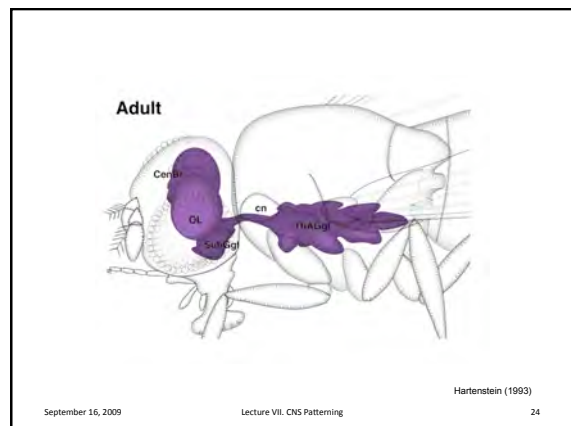
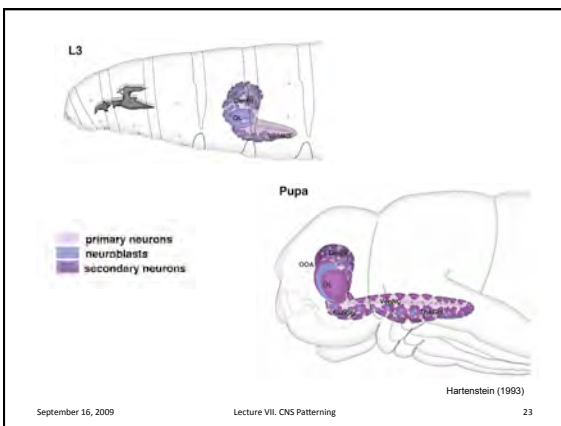
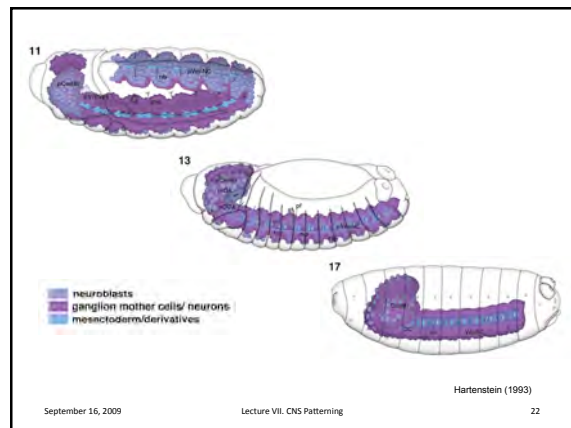
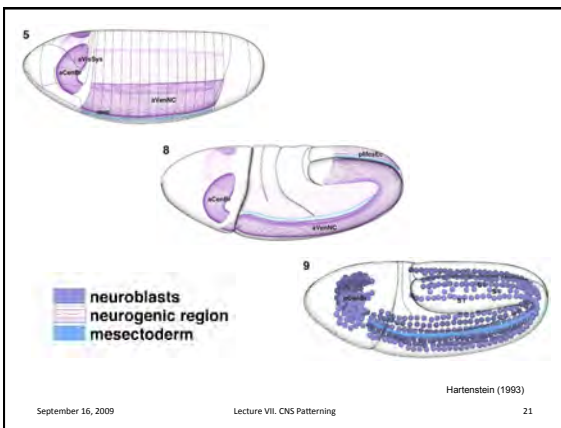
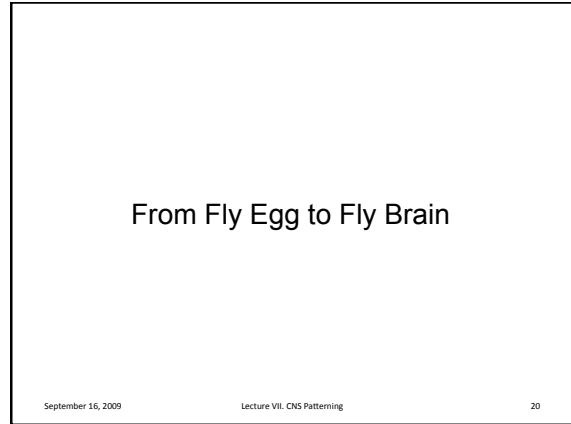
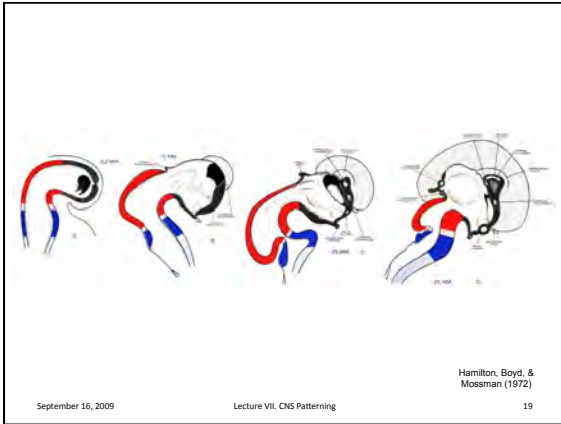
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## From Tube to Brain

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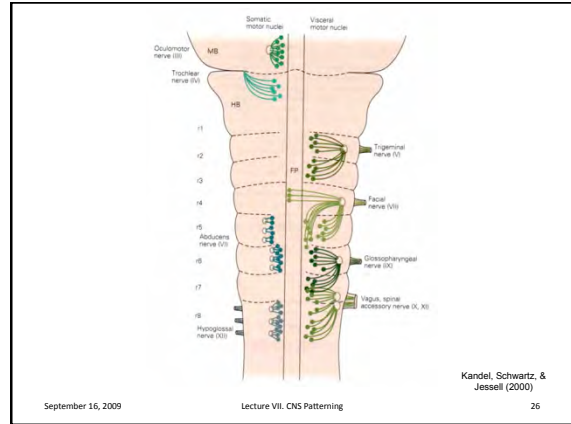
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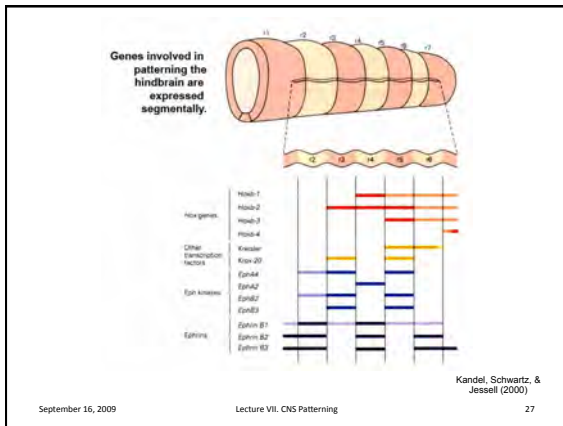


Segmentation and Signals

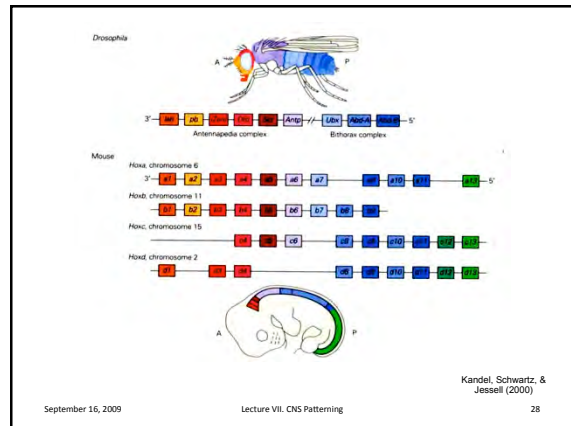
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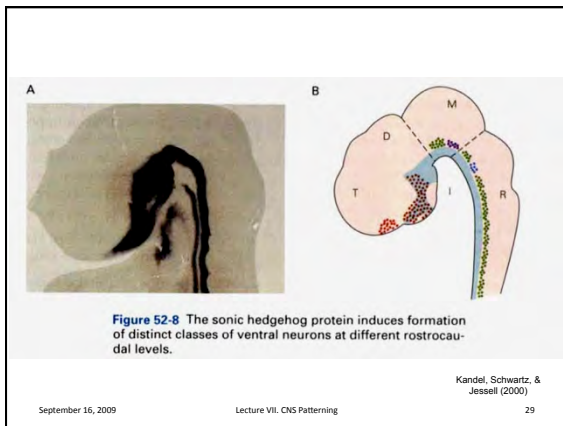
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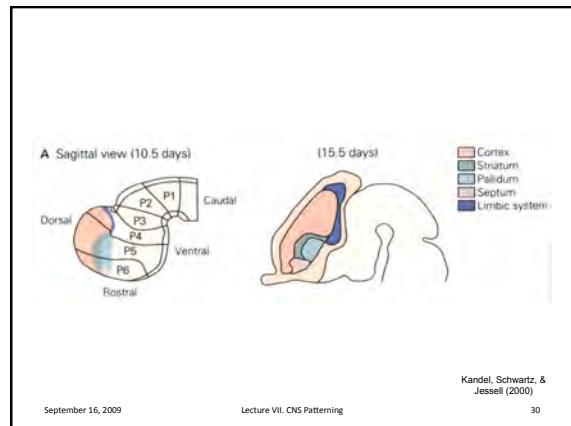
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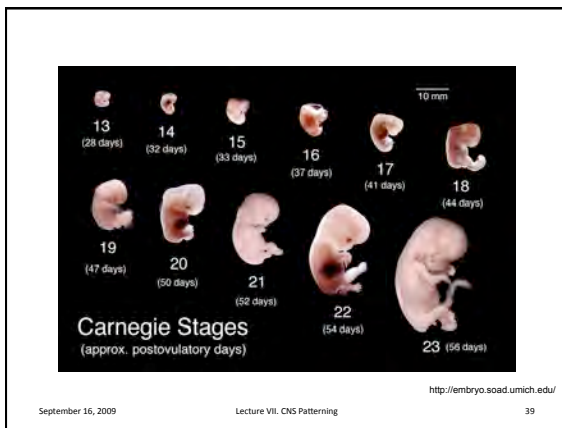
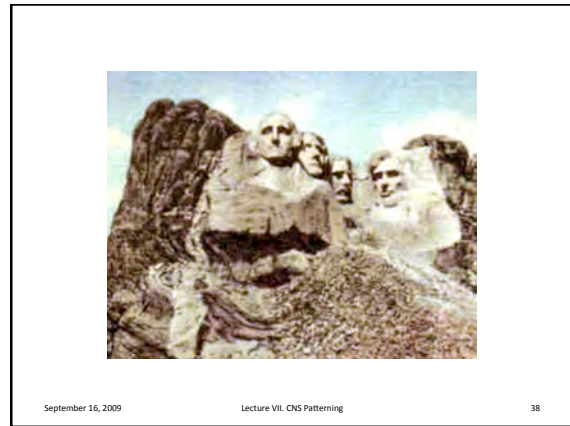
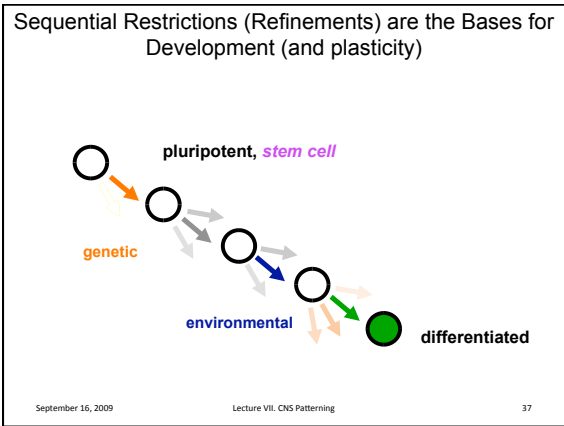


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