

E. Segmentation

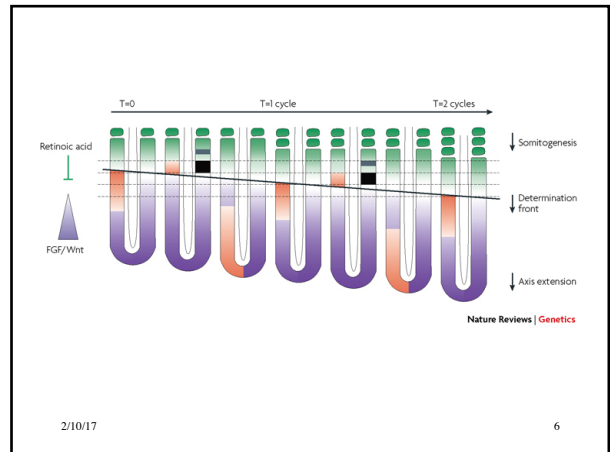
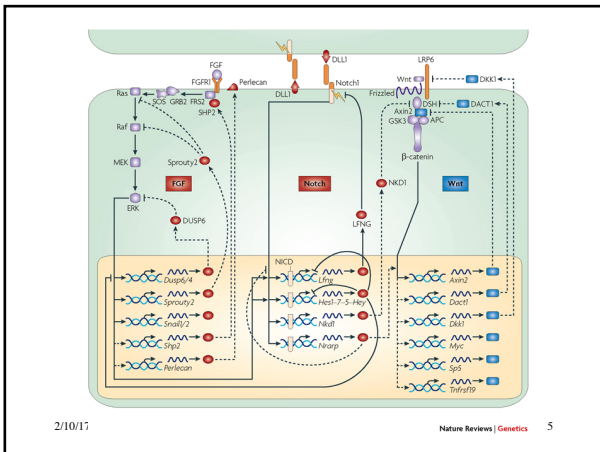
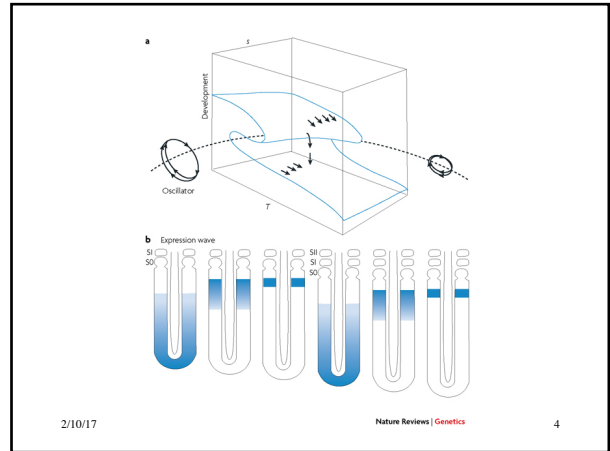
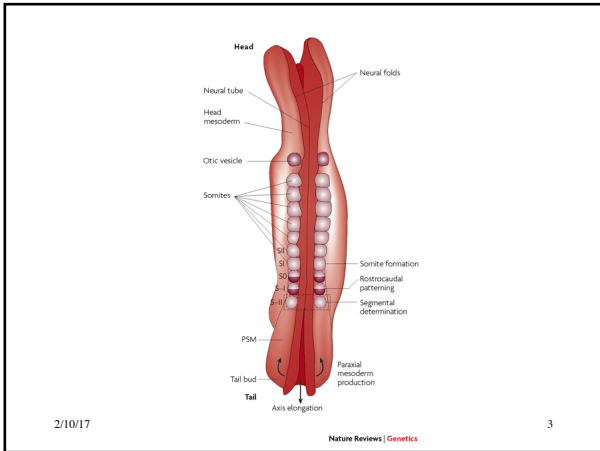
(in embryological development)

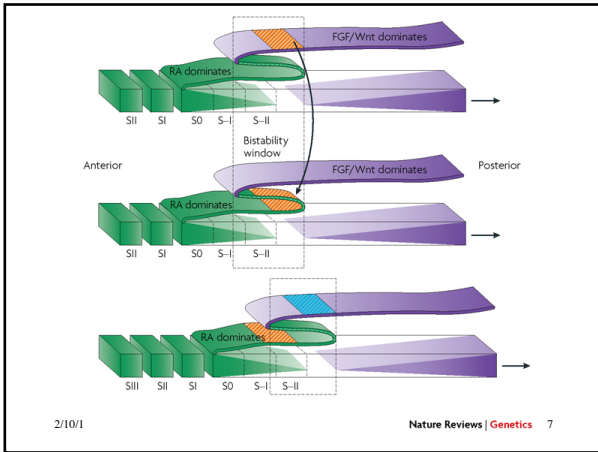
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Vertebrae

- Humans: 33, chickens: 55, mice: 65, corn snake: 315
- Characteristic of species
- How does an embryo “count” them?
- “Clock and wavefront model” of Cooke & Zeeman (1976).

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Simulated Segmentation by Clock-and-Wavefront Process

A 3D visualization of a simulated segmentation process. It shows a series of cells in a 3D space, with a wavefront moving through them. The text 'Run Segmentation-cells-3D.nlogo' is visible at the bottom center.

2D Simulation of Clock-and-Wavefront Process

A 2D simulation of the clock-and-wavefront process. It shows a series of cells in a 2D space, with a wavefront moving through them. The text 'Run Segmentation-cells.nlogo' is visible at the bottom center.

Effect of Growth Rate

Five horizontal panels showing the effect of growth rate on segmentation. The panels are labeled with growth rates: 500, 1000, 2000, 4000, and 5000. The text 'Effect of Growth Rate' is visible on the right side.

NetLogo Simulation of Segmentation

[Run Segmentation.nlogo](#)

Segmentation References

1. Cooke, J., & Zeeman, E.C. (1976). A clock and wavefront model for control of the number of repeated structures during animal morphogenesis. *J. Theor. Biol.* **58**: 455–76.
2. Dequéant, M.-L., & Pourquié, O. (2008). Segmental patterning of the vertebrate embryonic axis. *Nature Reviews Genetics* **9**: 370–82.
3. Gomez, C., Özbudak, E.M., Wunderlich, J., Baumann, D., Lewis, J., & Pourquié, O. (2008). Control of segment number in vertebrate embryos. *Nature* **454**: 335–9.

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