# E.
Segmentation

(in embryological development)

2/10/17   1

## 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).

2/10/17   2
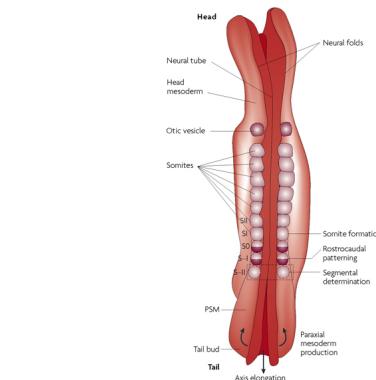
2/10/17   3

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2/10/17   4

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2/10/17   5

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2/10/17   6

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Nature Reviews | Genetics   7

2/10/1

Simulated Segmentation by Clock-and-Wavefront Process

2/10/17   Run Segmentation-cells-3D.nlogo   8

2D Simulation of Clock-and-Wavefront Process

2/10/17   Run Segmentation-cells.nlogo   9

Effect of Growth Rate

500
1000
2000
4000
5000

2/10/17   10

NetLogo Simulation of Segmentation

Run Segmentation.nlogo

2/10/17   11
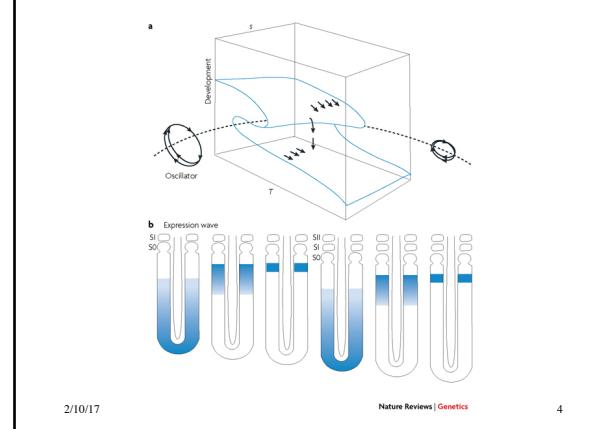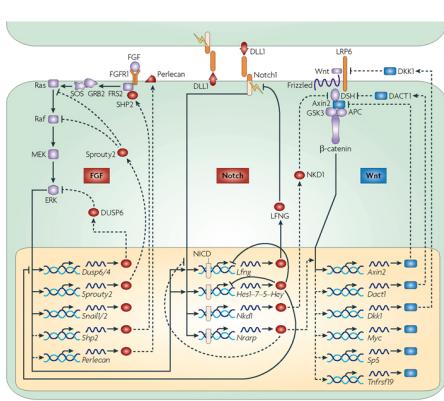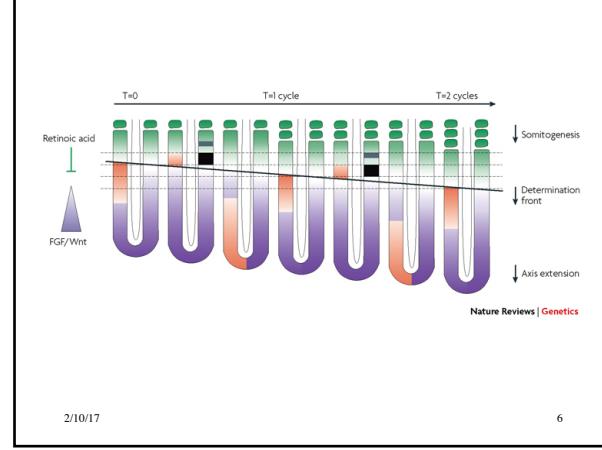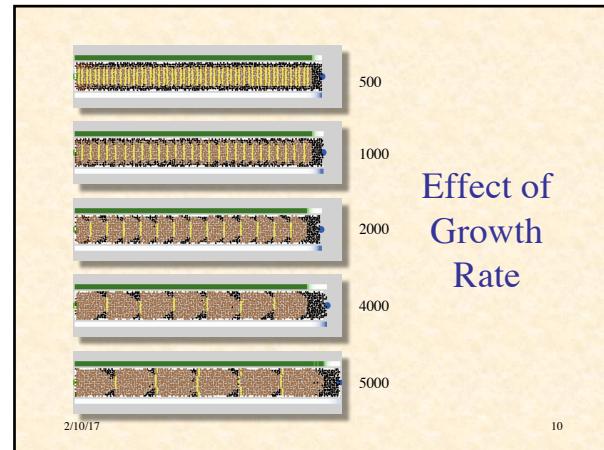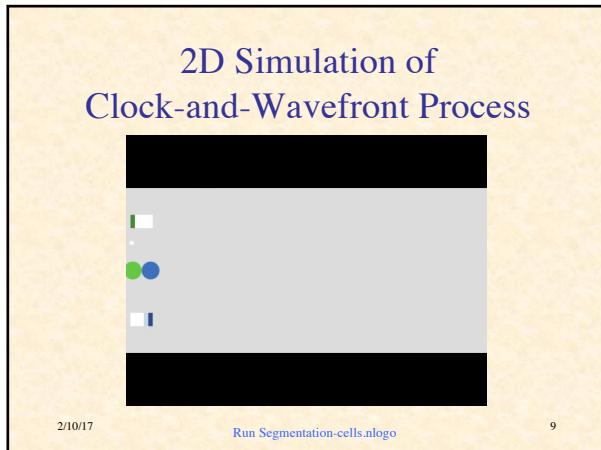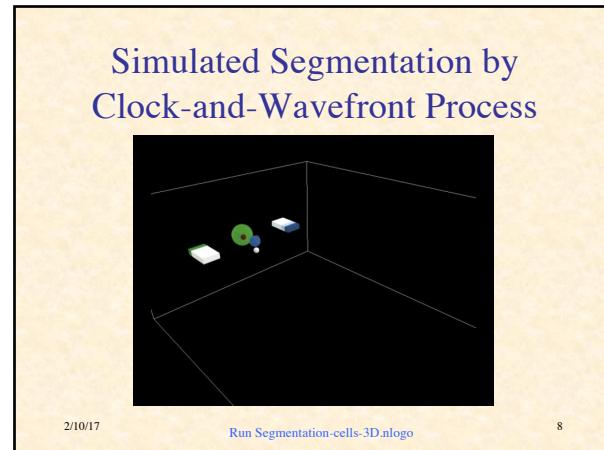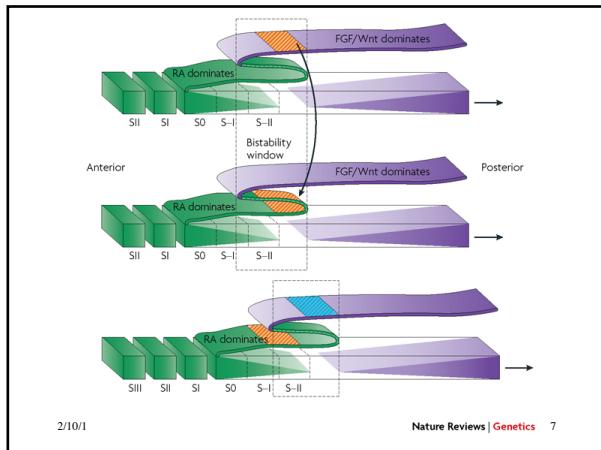
Segmentation References

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.

2/10/17   III.A   12