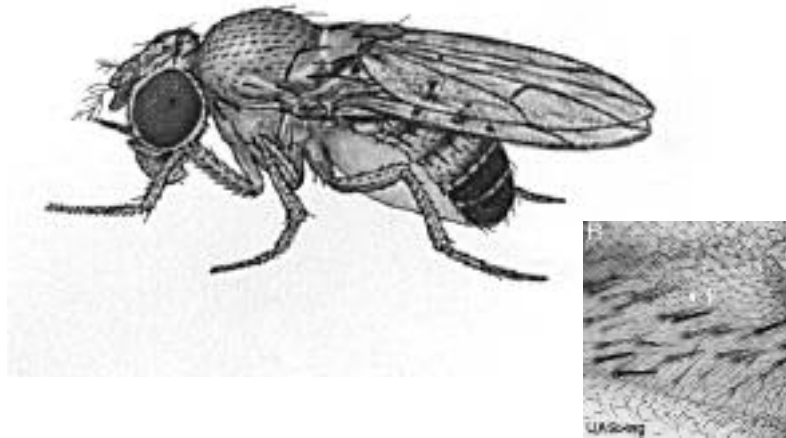


**I hope I shall not shock...too much if I add
that it is also a good rule not to put
overmuch confidence in the observational
results that are put forward until they have
been confirmed by theory**

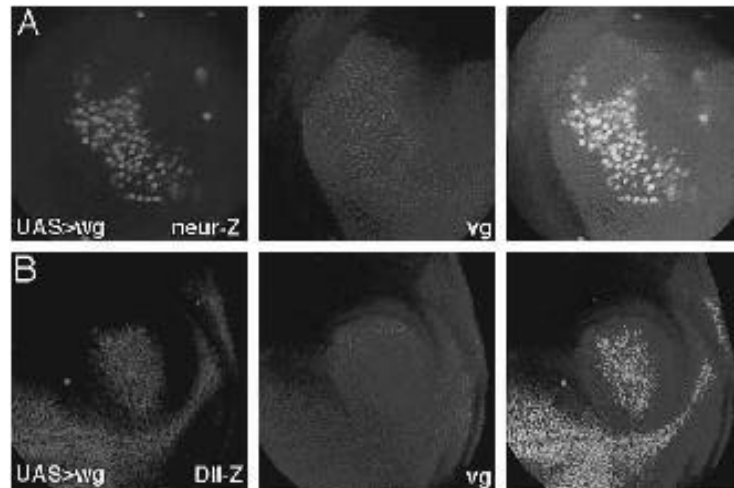
Eddington, 1935

- 1. Lateral inhibition and morphogen gradients.**
- 2. Developmental systems evolve in time.**
- 3. Correct spatial organization is essential
and heritable.**
- 4. Boundary conditions and the wing disk**

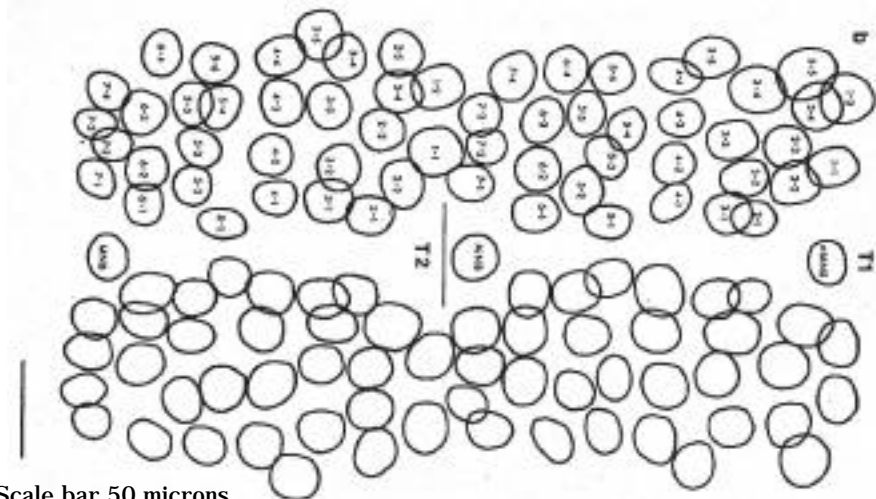
Drosophila



Cells interpret Wingless concentration



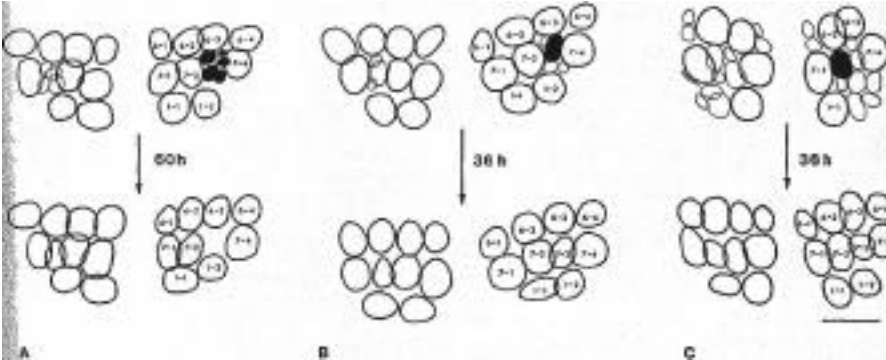
Origins of insect nervous system



Scale bar 50 microns

Doe & Goodman '85

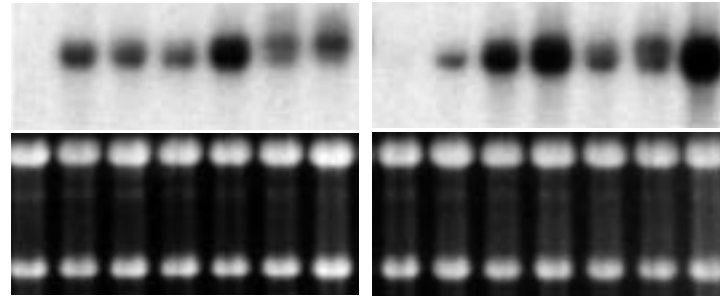
Lateral inhibition in the grasshopper



Doe & Goodman, '85

cAR1 expression

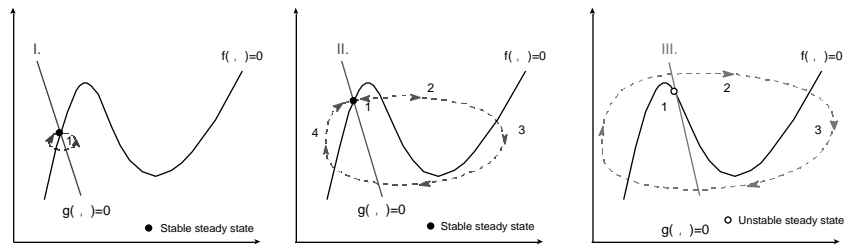
0 4 8 12 16 20 24 0 4 8 12 16 20 24 hrs



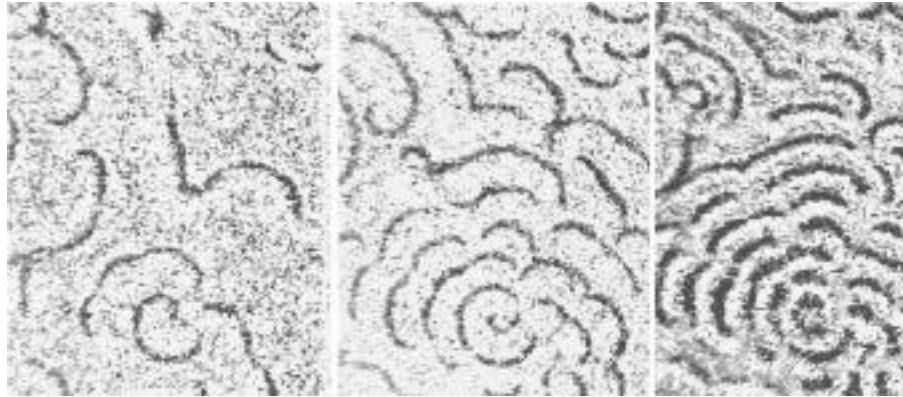
AX4

deletion

(Active cAMP receptor)

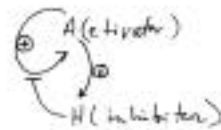


(External cAMP concentration)



Pálsson '97

- TURING
- 2 (or more) diffusing morphogens
 - all cells make both
 - above a certain threshold, some will "fire".



$$\frac{\partial A}{\partial t} = \underbrace{F(A, H)}_{\text{KINETIC TERM}} + \underbrace{D_A \frac{\partial^2 A}{\partial x^2}}_{\text{DIFFUSION TERM}}$$

$$\frac{\partial H}{\partial t} = G(A, H) + D_H \frac{\partial^2 H}{\partial x^2}$$

