KITP

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How to make a stochastic choice?

Noise.
- Transcriptional
- Signaling
- Cell history

Hypersensitivity
- Cooperative binding
- Synergistic activation

Bi-stable loop
- auto-activation
- double negative
- more complex loops
Dave Dubnau
Mike Elowitz
Left

Cog-1

Isy-6 ➔ mir-273

Die-1

ASE-L ➔ ASE-R

Right

Cog-1

Isy-6 ➔ mir-273

Die-1

ASE-L ➔ ASE-R

Oliver Hobert
Cell non-autonomous loops

N+/− N+/−

neurolast

epidermal

N− N+++
otd

spineless

Rh3
Rh5

Rh4
Rh6
spineless
spineless is necessary for the \textit{rh4/rh6} fate
91% on, 9% off in R7
What is the signal between R7 and R8?

Normal Rh3 Rh4

X?

All Rh6 in melted or don
Normal Rh3 Rh4

All Rh5: Lats/warts
Rh5 Rh6

wt

GMR>warts

GMR>melt
A Bistable Loop

Hippo
Salvador
Wts
Lats

Melt

Tor

S6K

TSC1/2

Insulin

Nutrition sensor

R7

Proliferation
Cell death

R8
Differentiation

Cell size
Are Rhodopsins involved in the fate of photoreceptors?

Rh5
Rh6
rh6<sup>1</sup> mutant: co-expression of Rh5 & Rh6-GFP
Rescue of *rh6* mutants by *rh6>*Rh6

**Rh5**

*rh6>*Rh6 & GFP
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