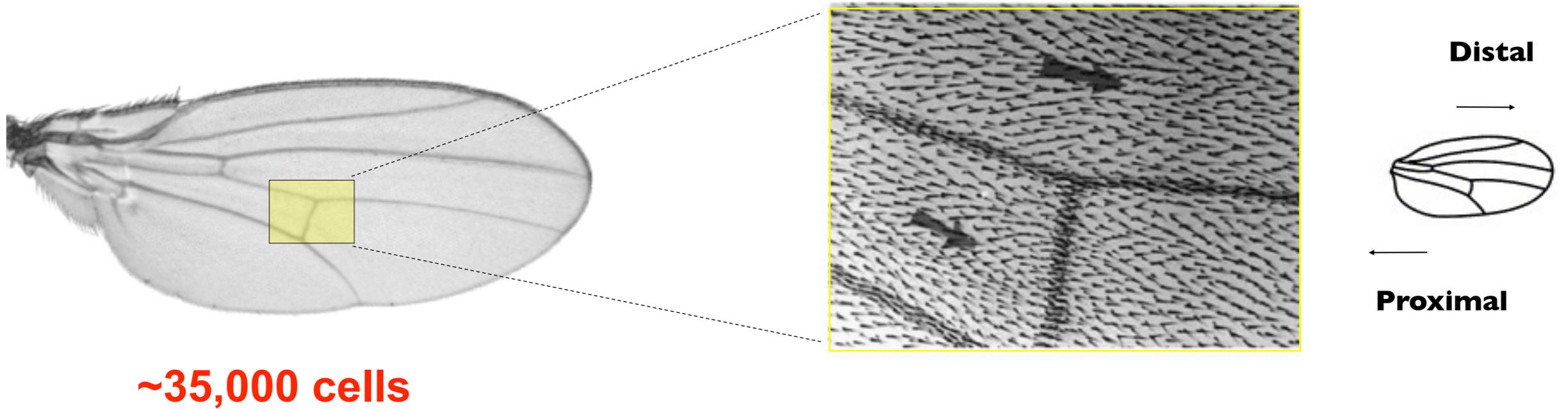
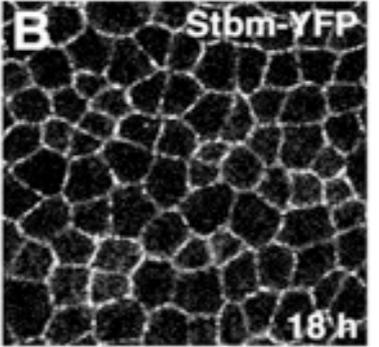
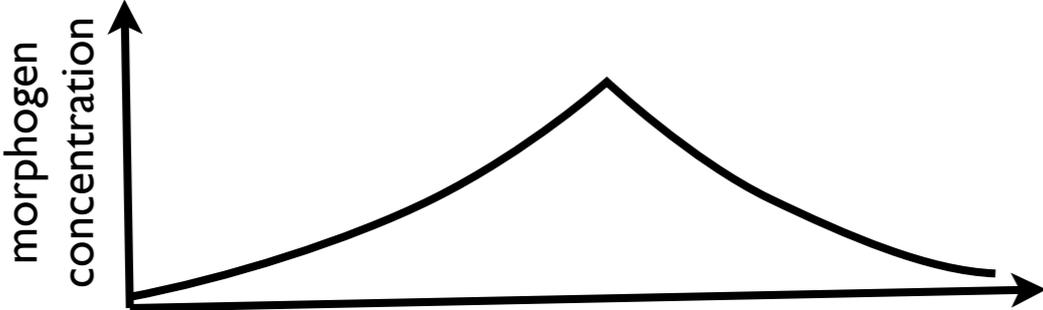
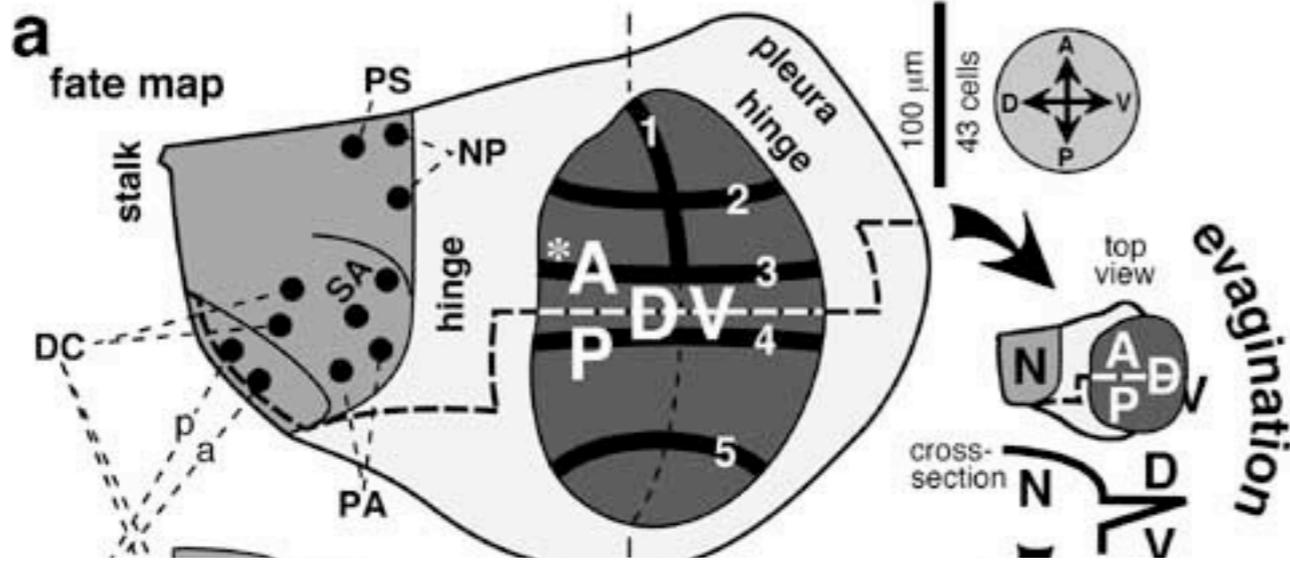


“Fly Magnetism”

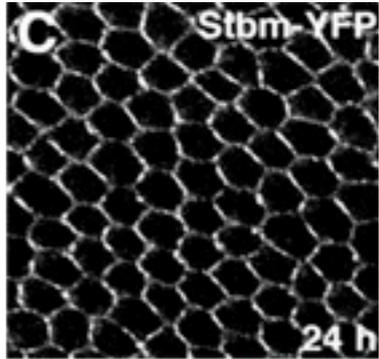
Planar Cell Polarity



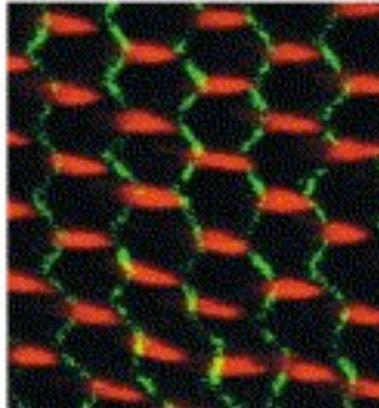
Wing disks



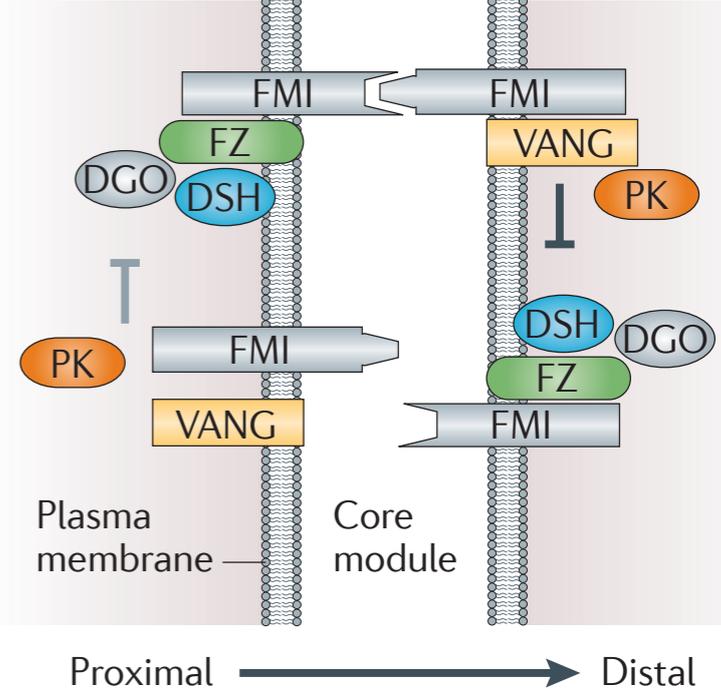
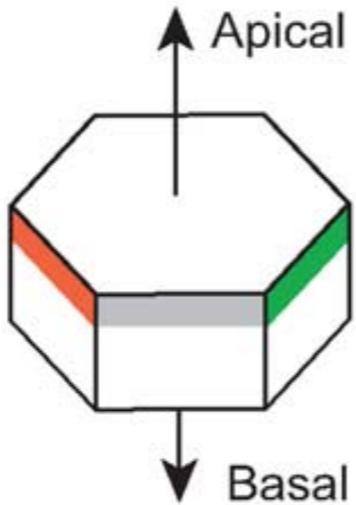
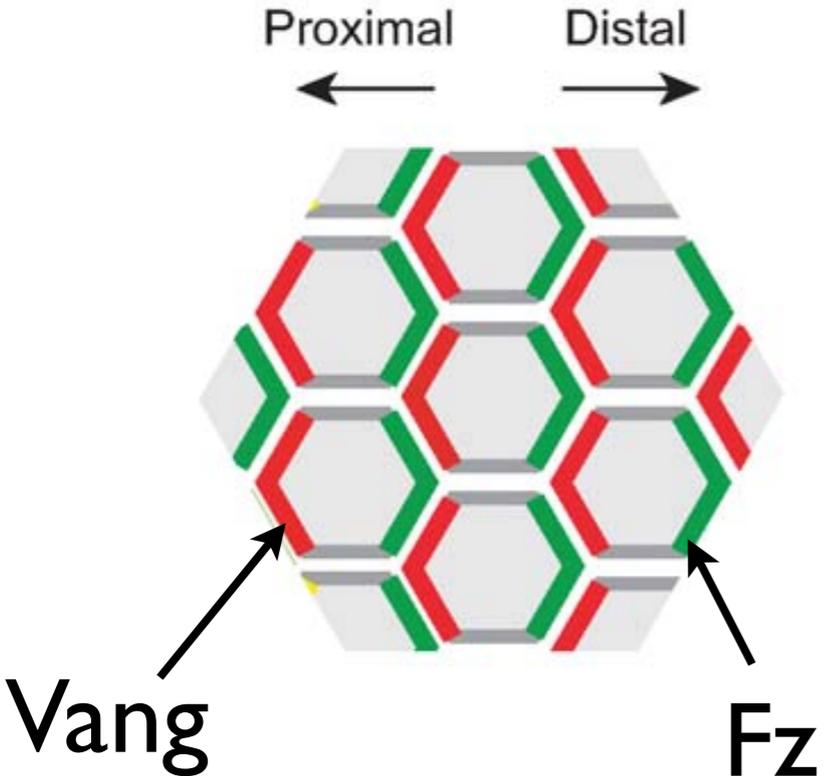
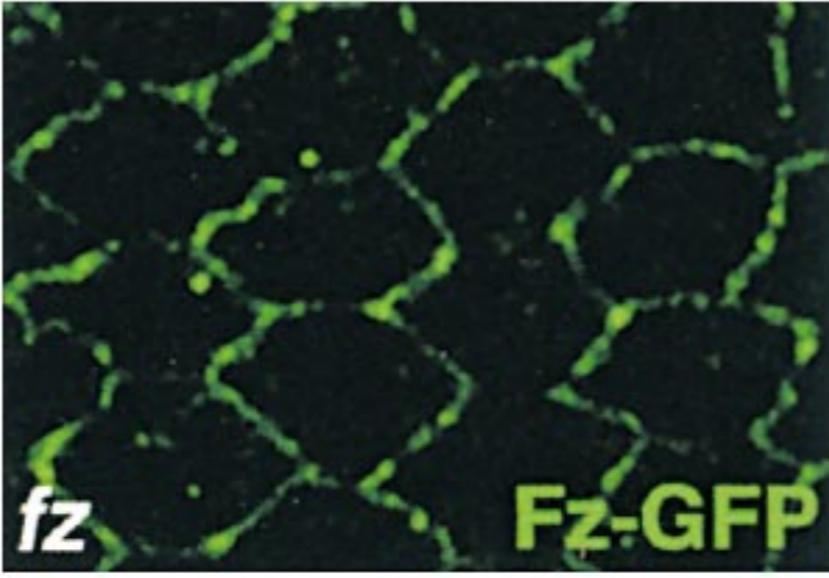
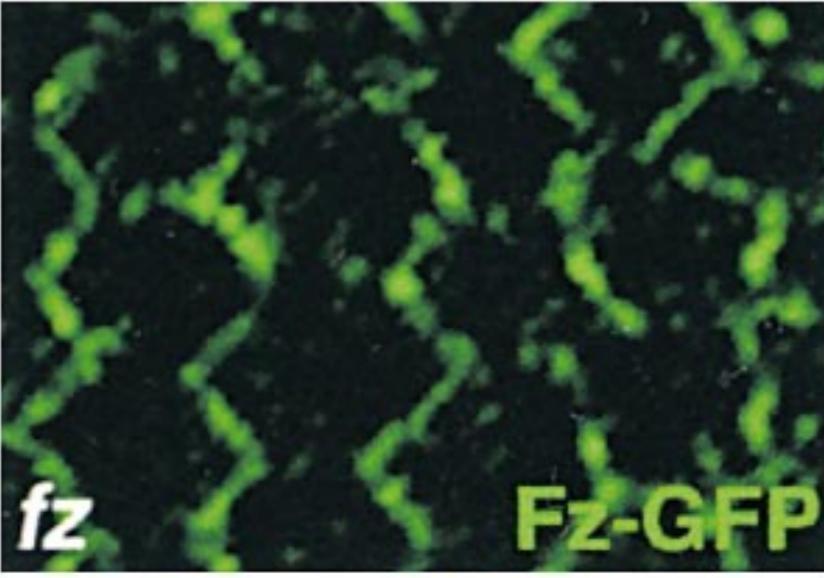
18h APF



24h APF

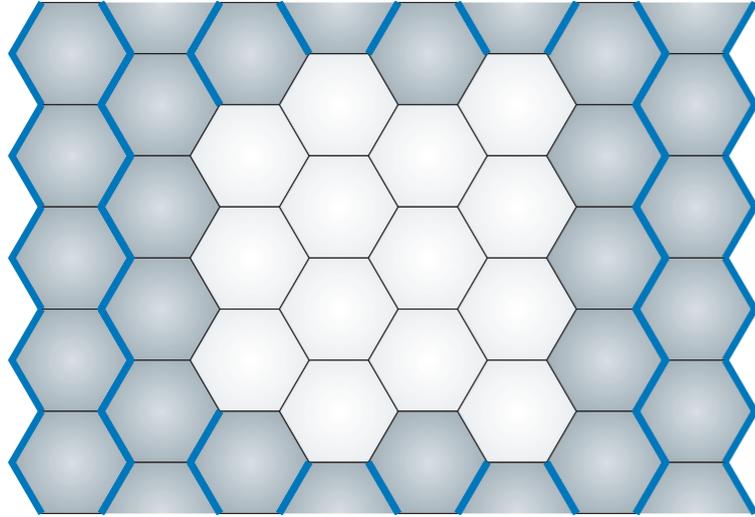


Asymmetric localization of proteins

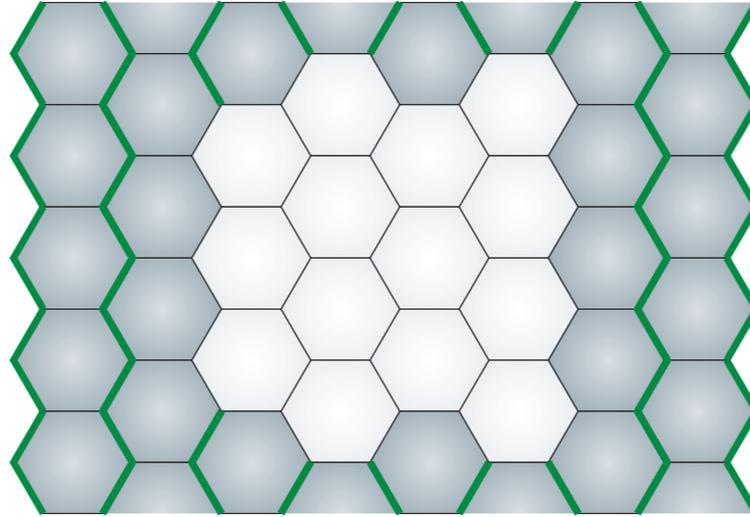


Mosaic flies

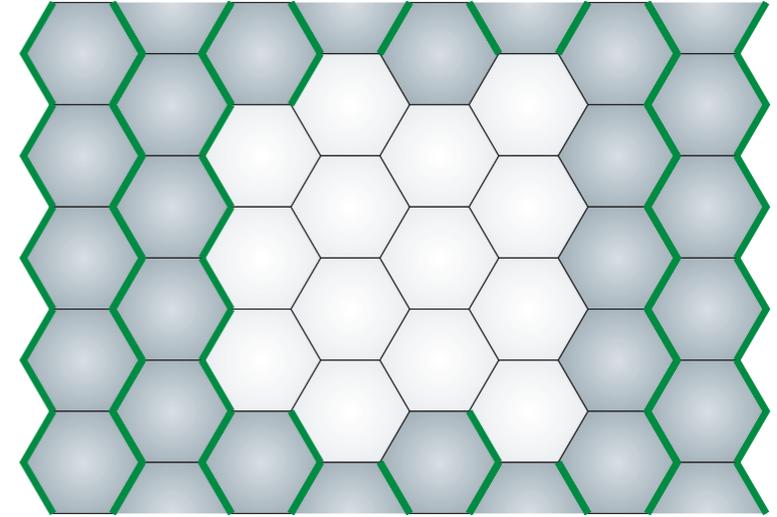
a STAN localization (blue)
stan⁻ cells (white)



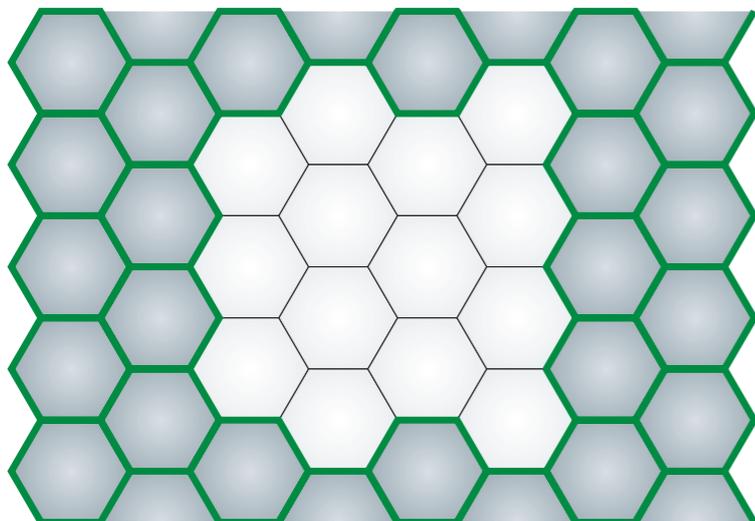
b FZ::GFP localization (green)
stan⁻ cells (white)



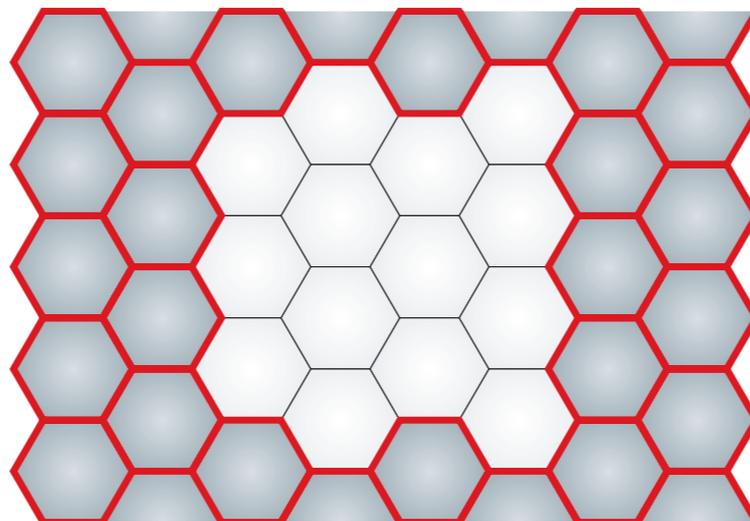
c FZ::GFP localization (green)
non-expressing cells (white)



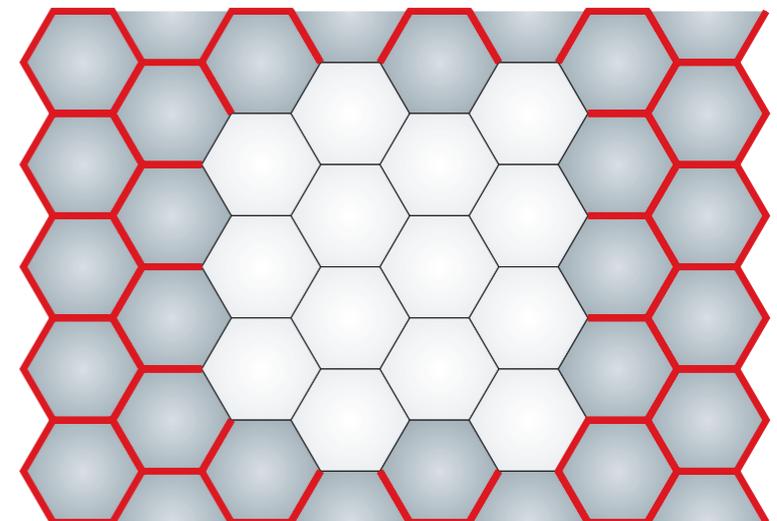
d FZ::GFP localization (green)
non-expressing cells (white) in *pk*⁻ cells



e DS localization (red)
ds⁻ cells (white)



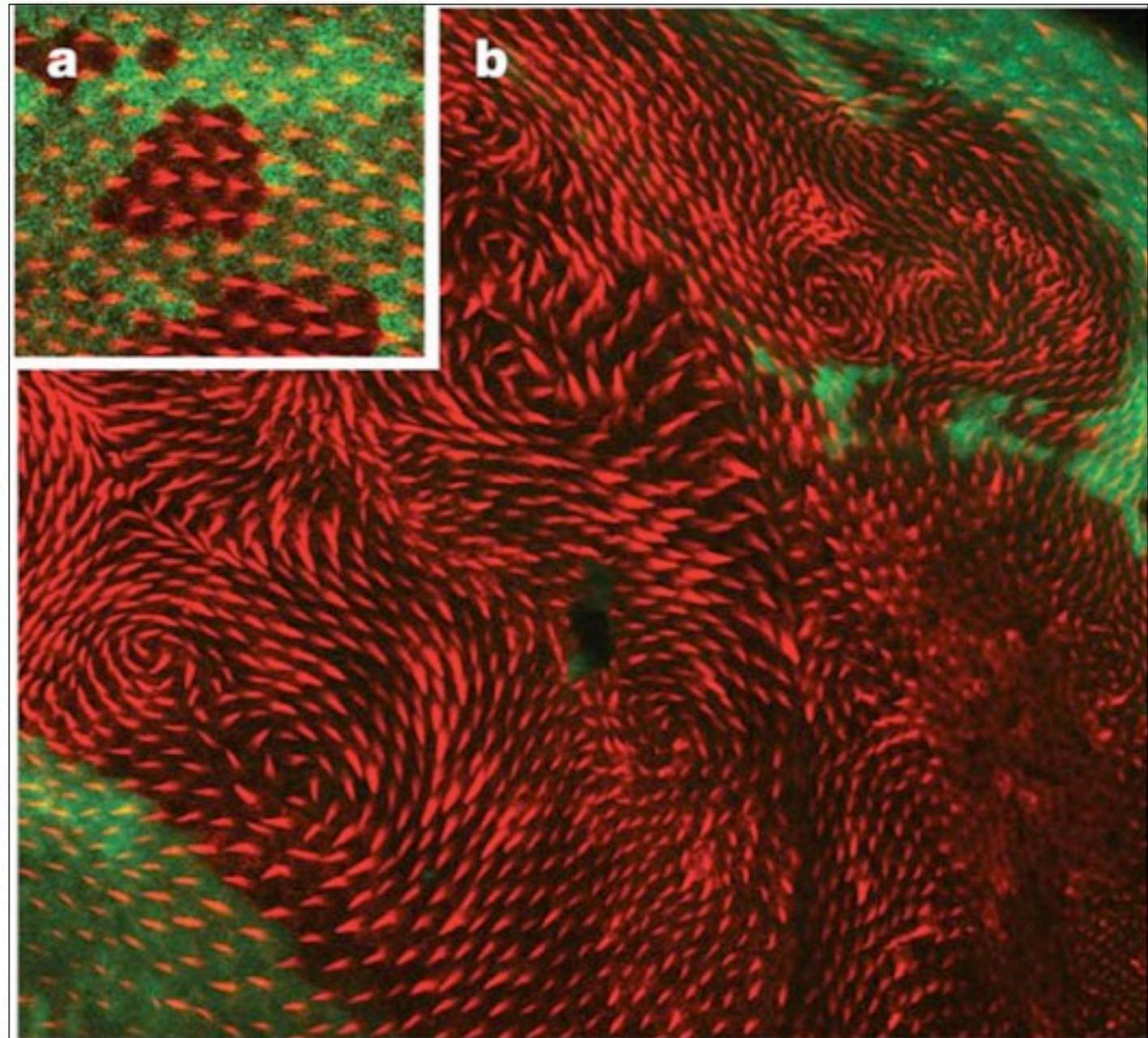
f DS localization (red)
ds⁻ *ft*⁻ cells (white)



Chimeric mutants

Red: fat mutant.

Green: wild type cells



- Fat mutants maintain local order
- show swirling pattern, reminiscent of models of magnets

Ma, Yang, McNeill, Simon, Axelrod (2003)

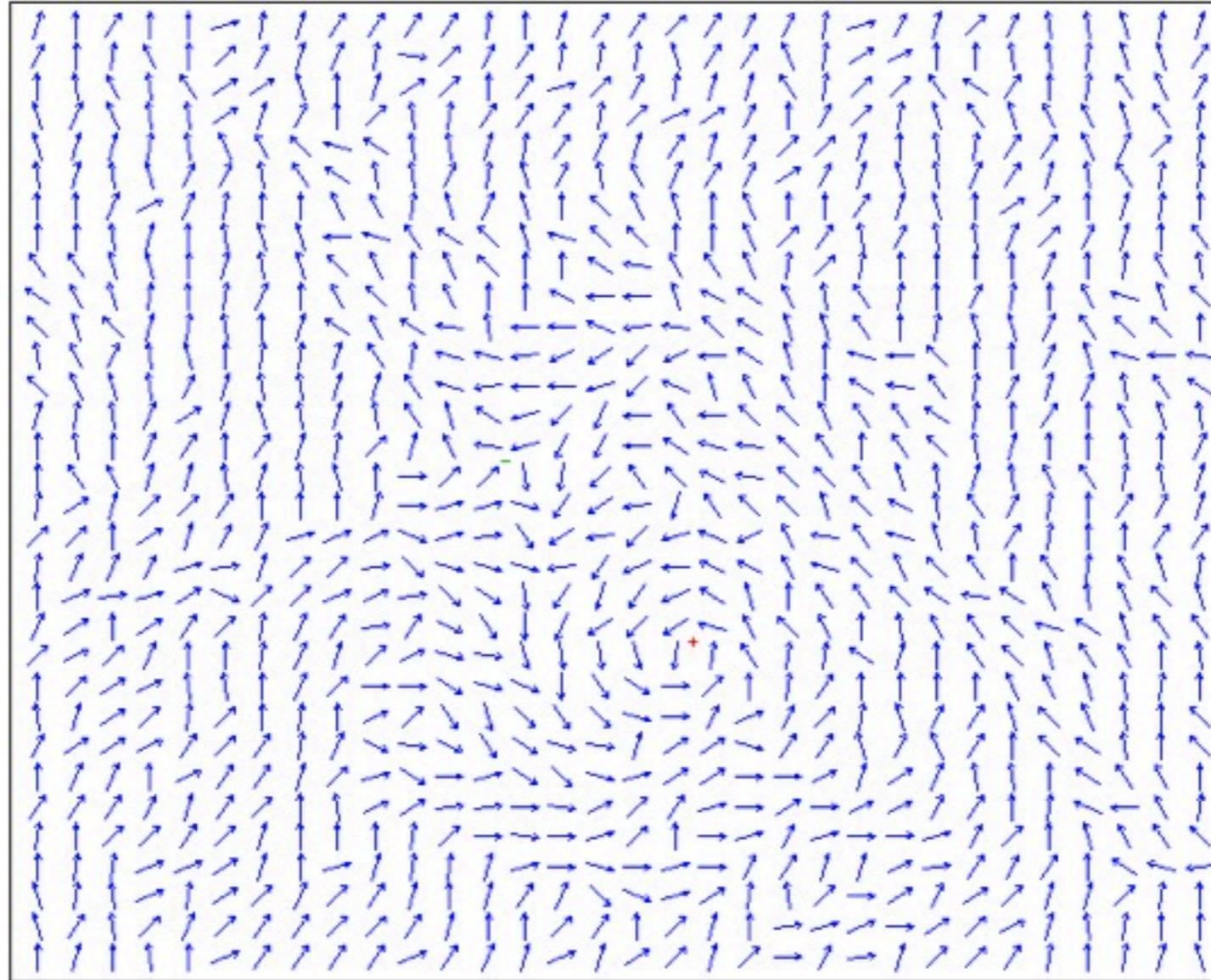
Salient features

- Individuals cells are polarized
- orient each other via interactions on the membrane
- a global signal that sets the preferential orientations
- w/o global signal, local order persists, but is lost on larger scales

All of the above are features of magnets

XY model of magnetism

L: 32 T: 0.5 H: 0 dtheta 0.5 Start Step Continue



t: 4555 Mx: 96.48 My: 681.87 E: -1741.8 <Mx>: 183.12 <My>: 724.08 <E>:

Changing the amount of fz

