

Module 3: Activator-Inhibitor

Author: Lutz Brusch

Aim:

- Introduce self-organized pattern formation (Turing patterns)
- Show the potential of qualitative/theoretical modeling

Description:

- Activator-Inhibitor models
- Theoretical introduction on Turing patterns (1951)
- Self-organized organizer
- large system size = periodic pattern
- change inhibitor diffusion and observe changing pattern wavelength
- half-wavelength system size and no flux bc. = spontaneous symmetry break of homogeneous init.cond. with max and min at opposite boundaries
- Fish coat pattern:
- Miyazawa et al.
- Trigger discussion:
- Parameters and variables do no longer correspond to molecules anymore
- What is the explanatory power of 'blending model'?
- Bottom-up, top-down, middle-out

Paper:

- Miyazawa, Okamoto and Kondo, Blending of animal colour patterns by hybridization, Nature Communications, 2010. [link](#)

Morpheus models:

- [Activator-Inhibitor: reaction-diffusion in one dimension](#)
- [Turing patterns: spatial parameter exploration](#)

From:

<https://imc.zih.tu-dresden.de/wiki/morpheus/> - **Morpheus**

Permanent link:

<https://imc.zih.tu-dresden.de/wiki/morpheus/doku.php?id=documentation:course:module3&rev=1355486140>

Last update: **12:55 14.12.2012**

