Investigating activity dependent dynamics of synaptic structures using biologically plausible models of post-deafferentation network repair

University of Hertfordshire UH

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The brain: learning, plasticity, stability

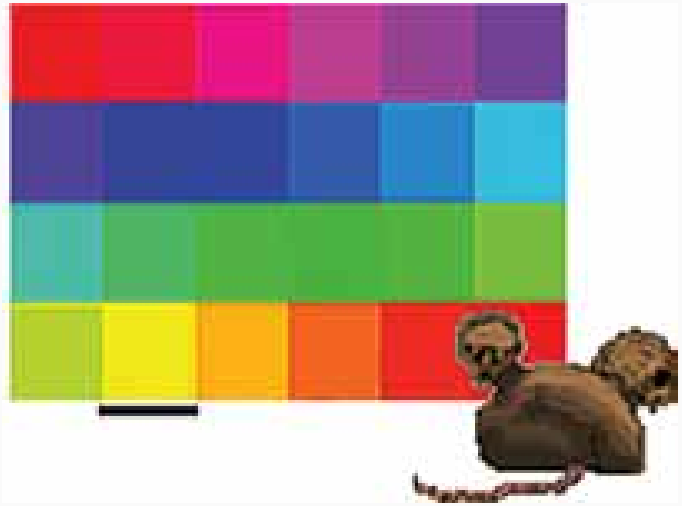
The brain: in numbers

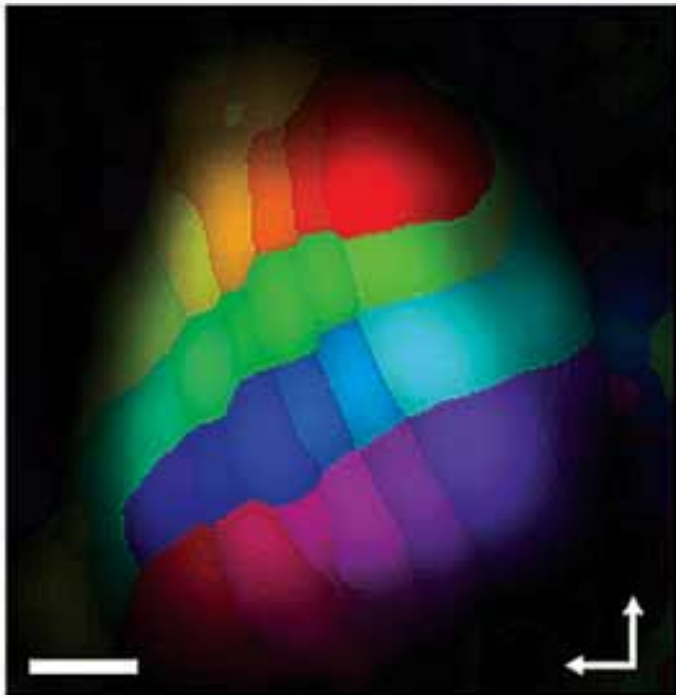
The brain: learning and plasticity

The brain: plasticity while homeostasis

Studying homeostatic processes

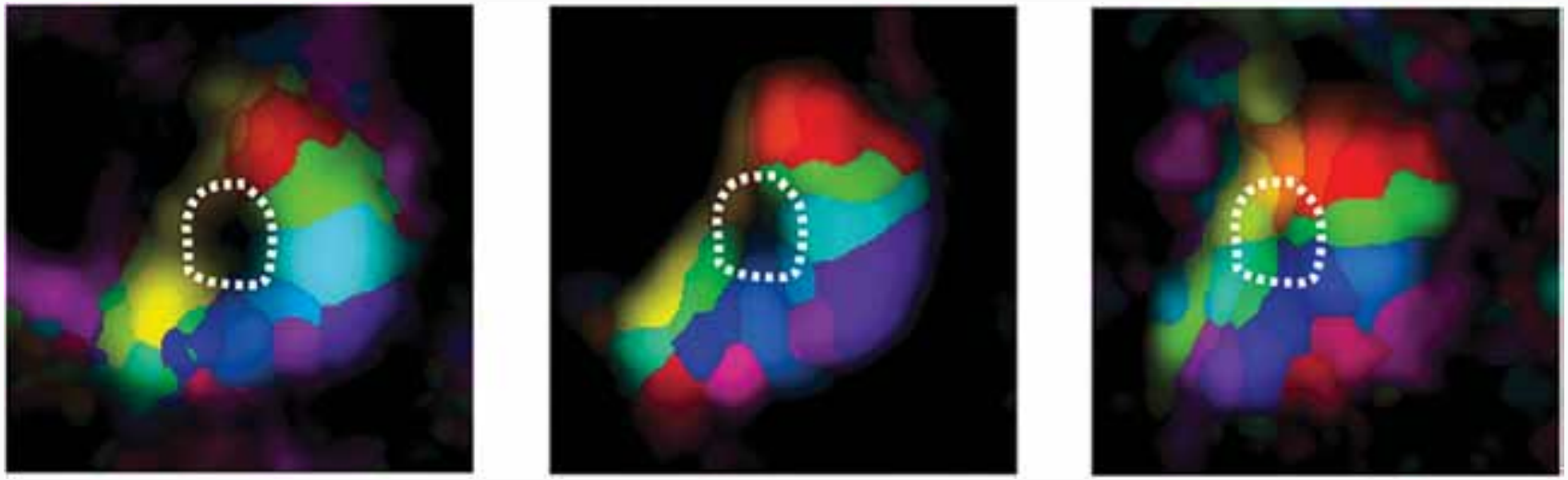
Experimental protocol I





[1] **Keck2008**

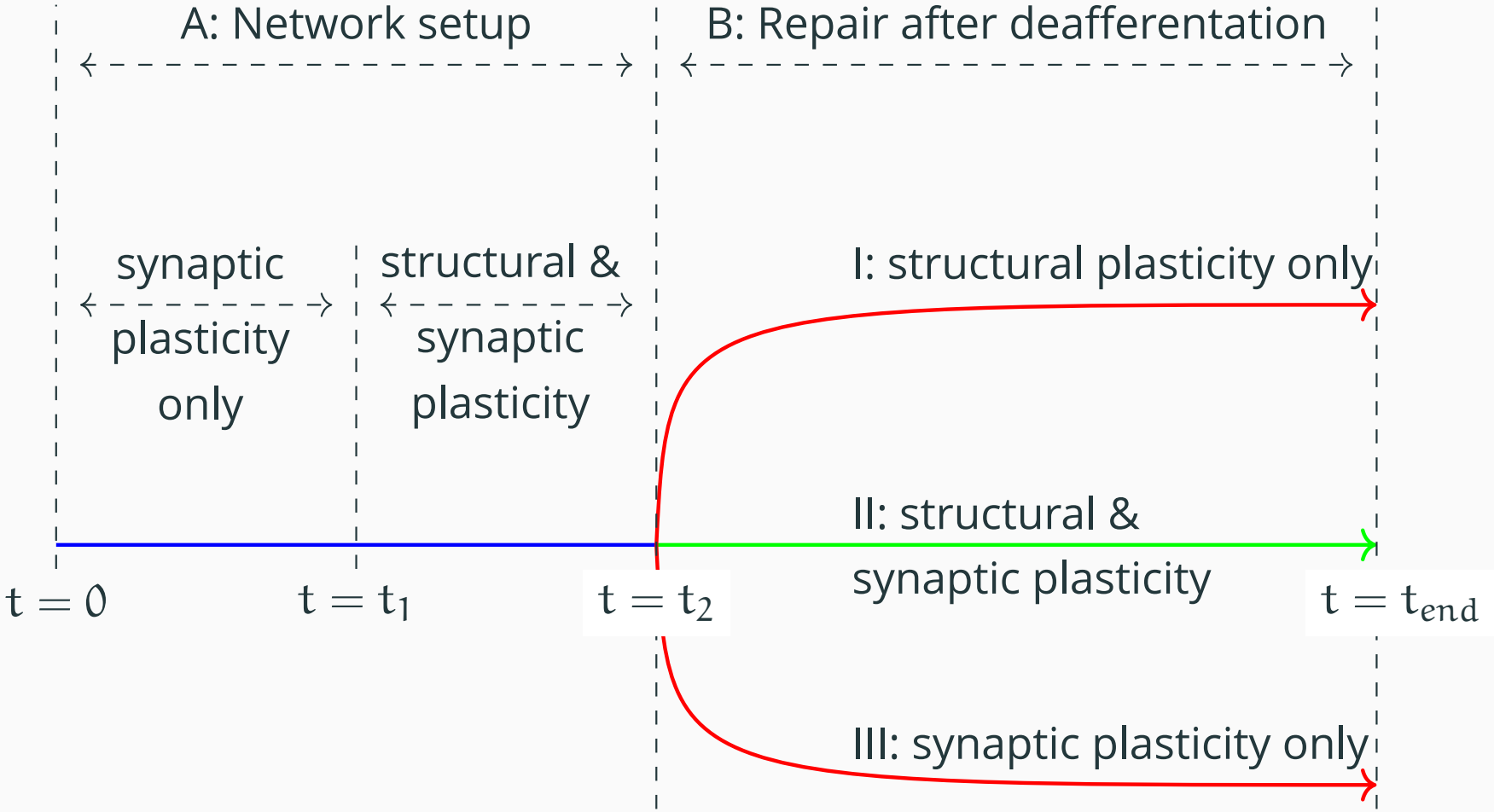
Experimental protocol II: after peripheral lesion



[1] **Keck2008**

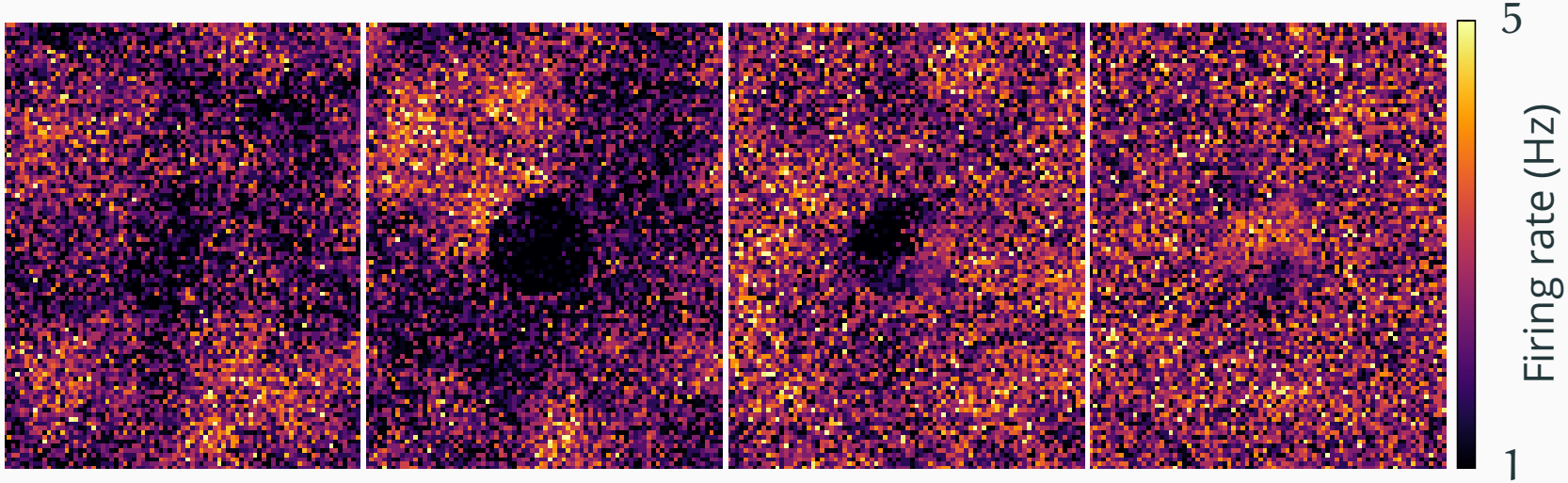
Our model

Simulation protocol



Results and discussion

Deafferentation and successful repair



Conclusions

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- Replicates experimental observations:
- Suggests:
  - Activity dependent dynamics for synaptic structures.
  - Single neuron stabilisation by structural plasticity.

Now what?

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- Application of growth dynamics to multi-compartmental neuron models?

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- Application of growth dynamics to multi-compartmental neuron models?
- Faithful modelling of cytoskeleton modification (actin)?