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Ramón y Cajal Investigator

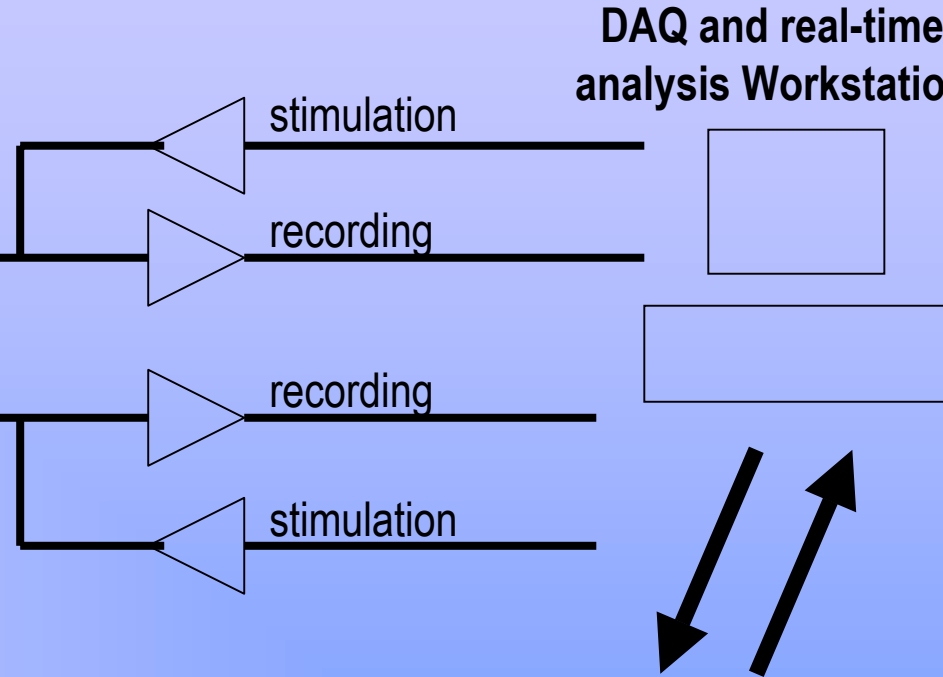
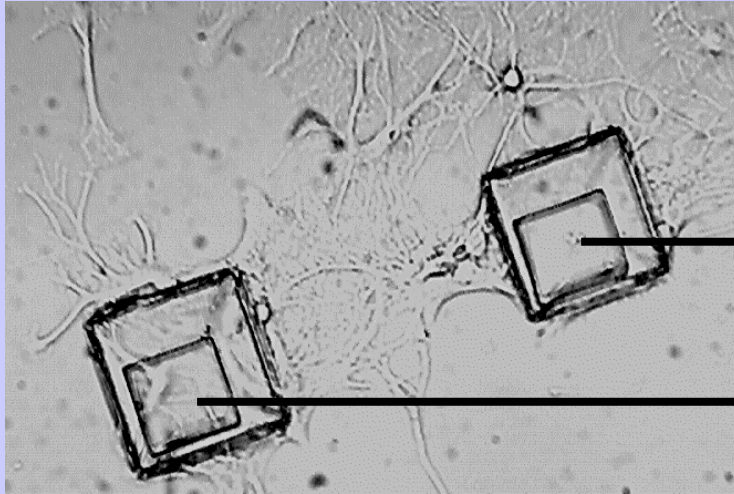
Technical University of Catalonia

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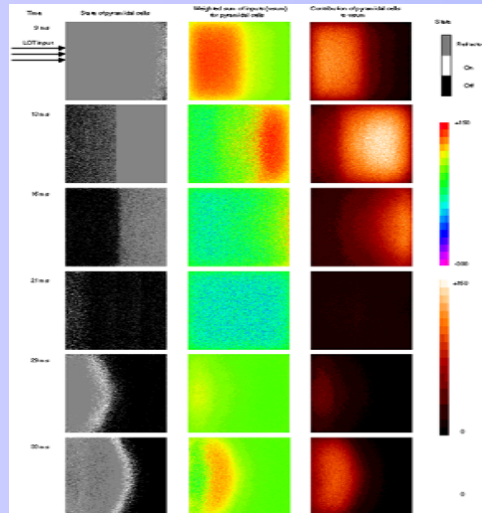
**Automating reverse engineering of the brain**

# Cultured Neuronal Arrays for Neuro-Algorithm Extraction

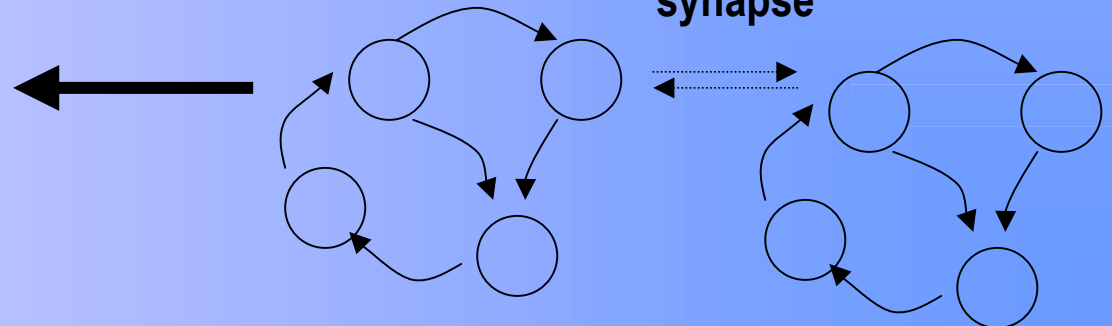
## Microfabricated multineuron sensor



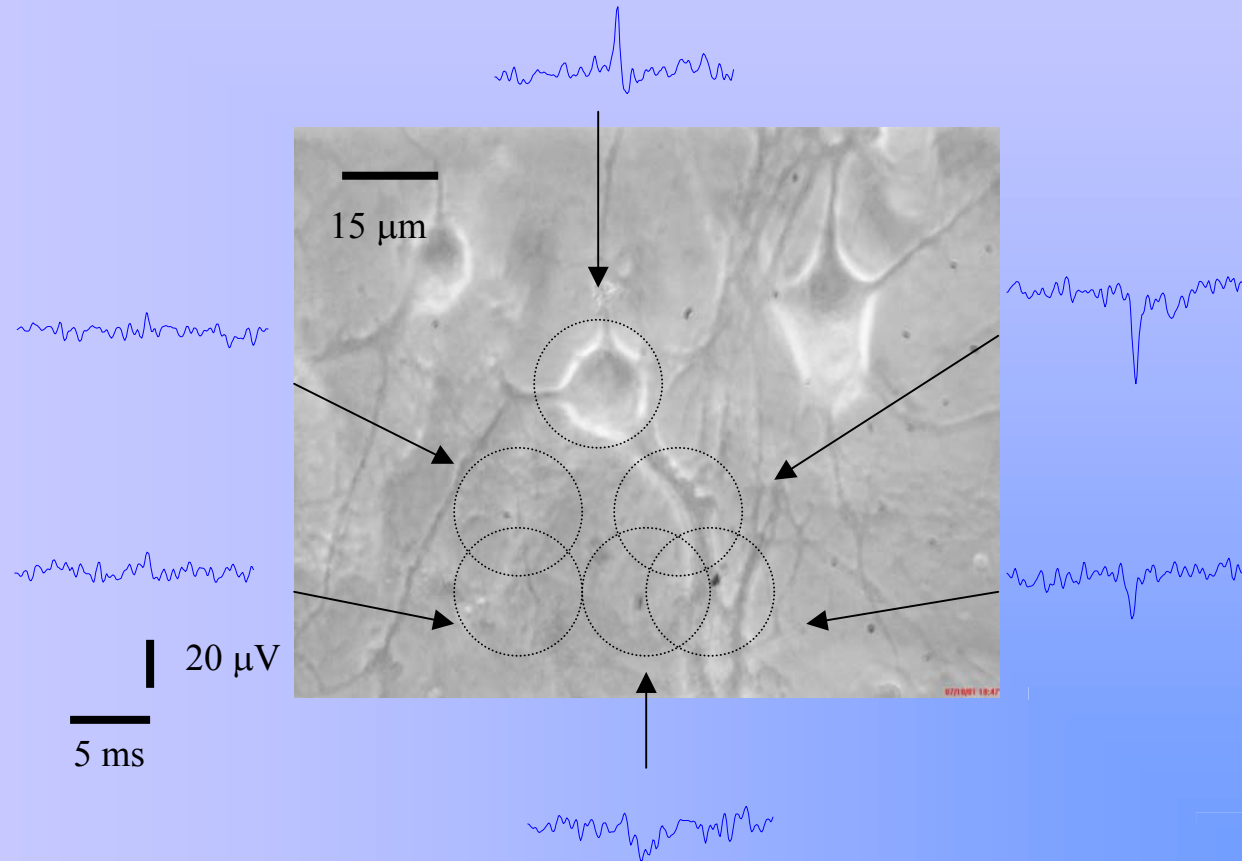
## Large-scale (>10<sup>6</sup> neurons) offline simulation



## Automated real-time automaton extraction synapse

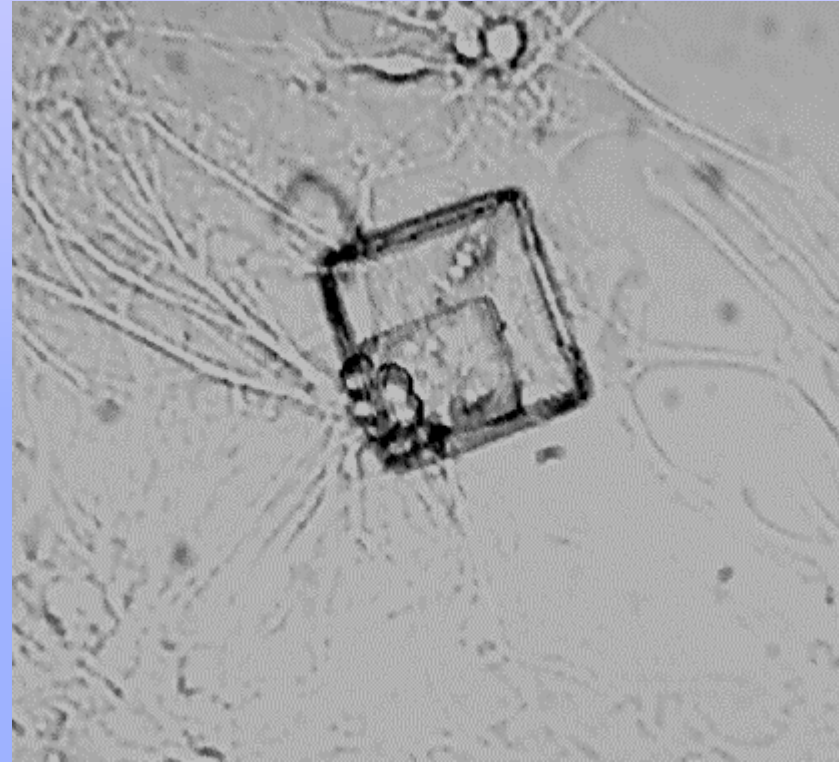
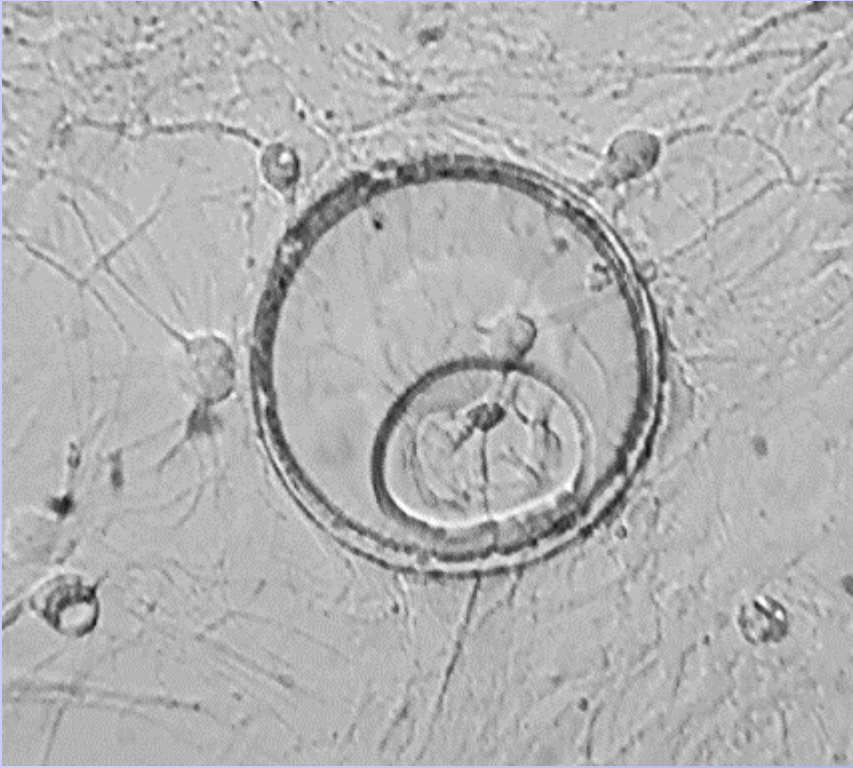


# 2D mapping of extracellular potentials



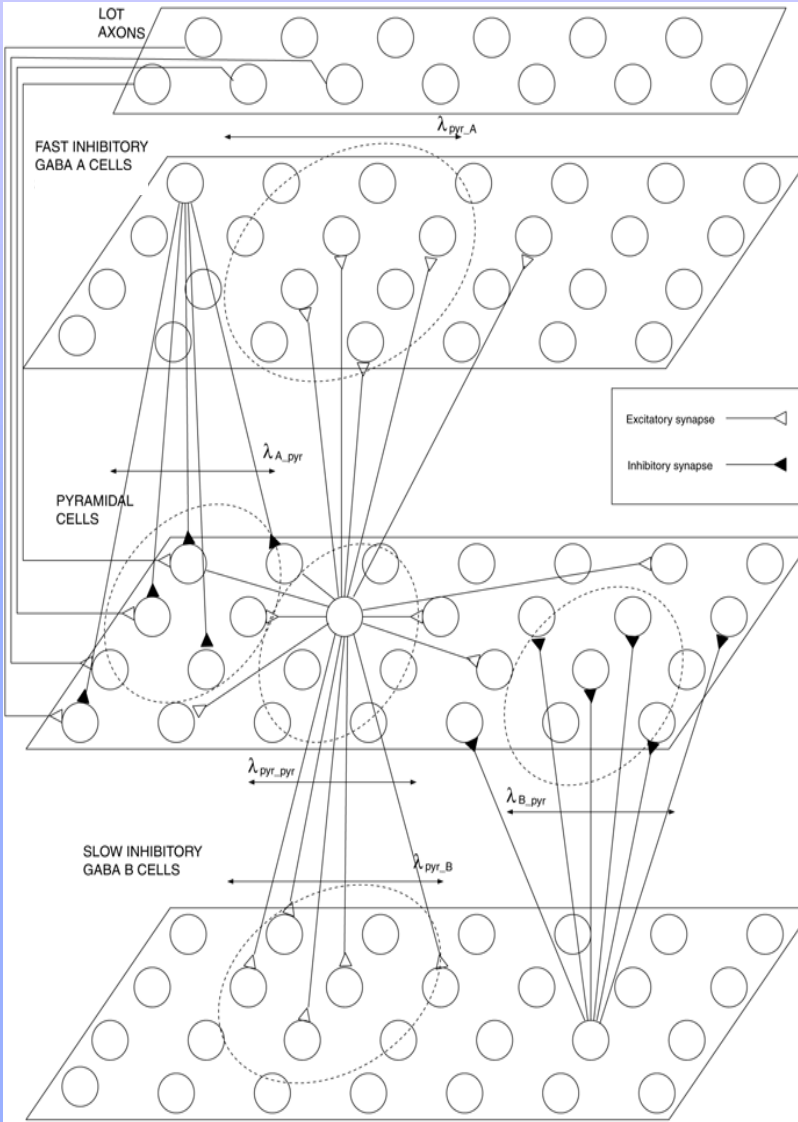
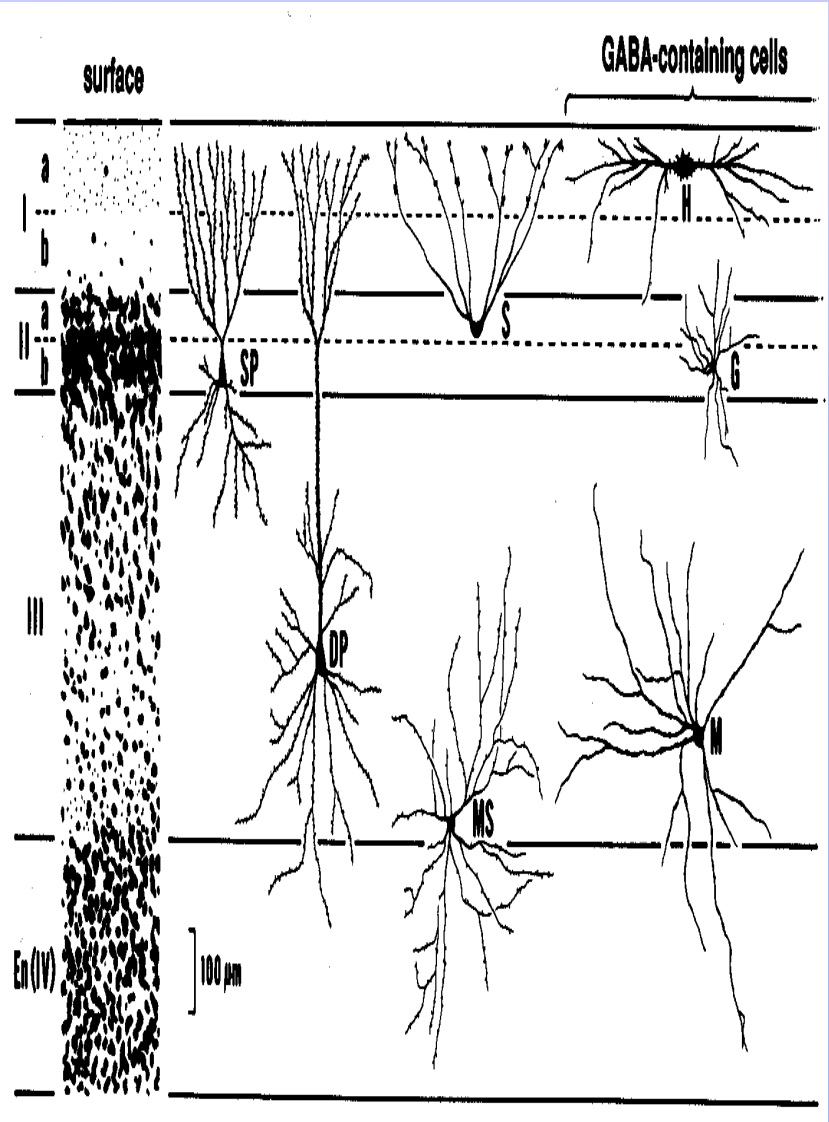
Claverol and Pine (2002) J. Neurosc. Methods 117(1):13

## Microfabricated structures and MEAs



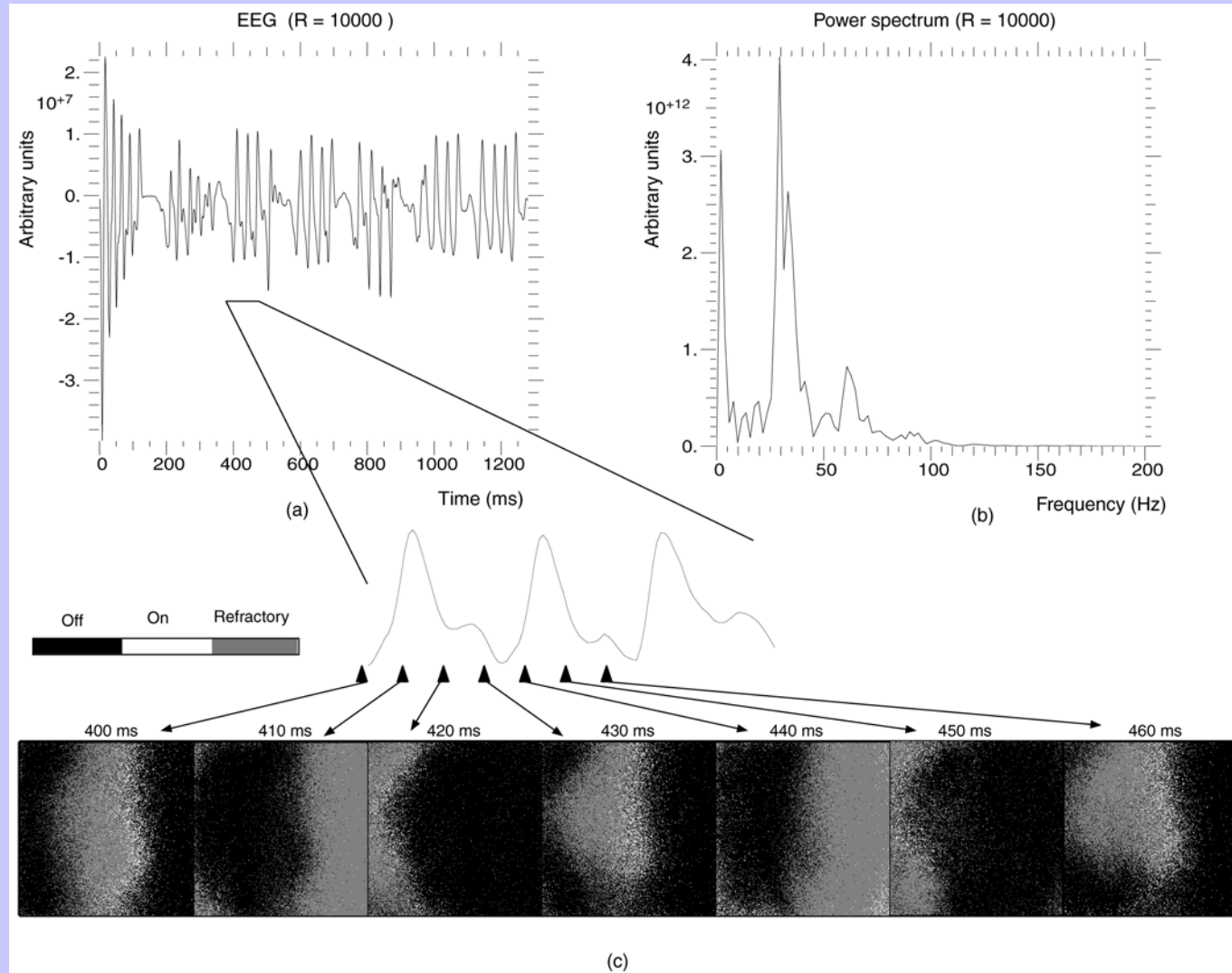
He, Q. and Claverol-Tinture, E. (2001, unpublished)

# Piriform cortex cytoarchitecture and model



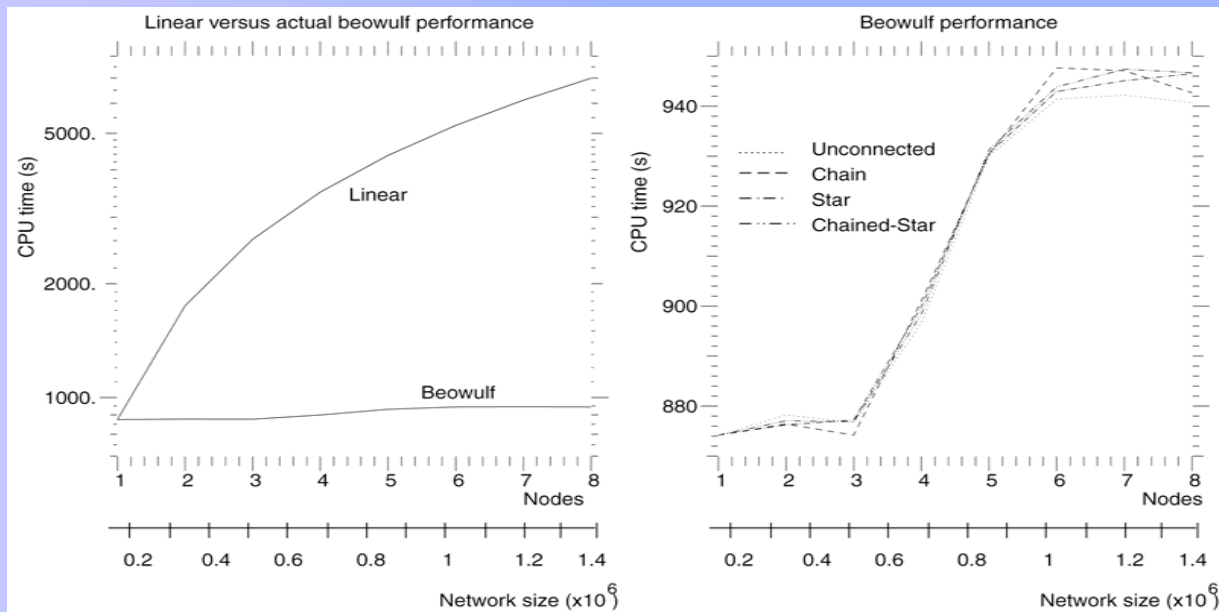
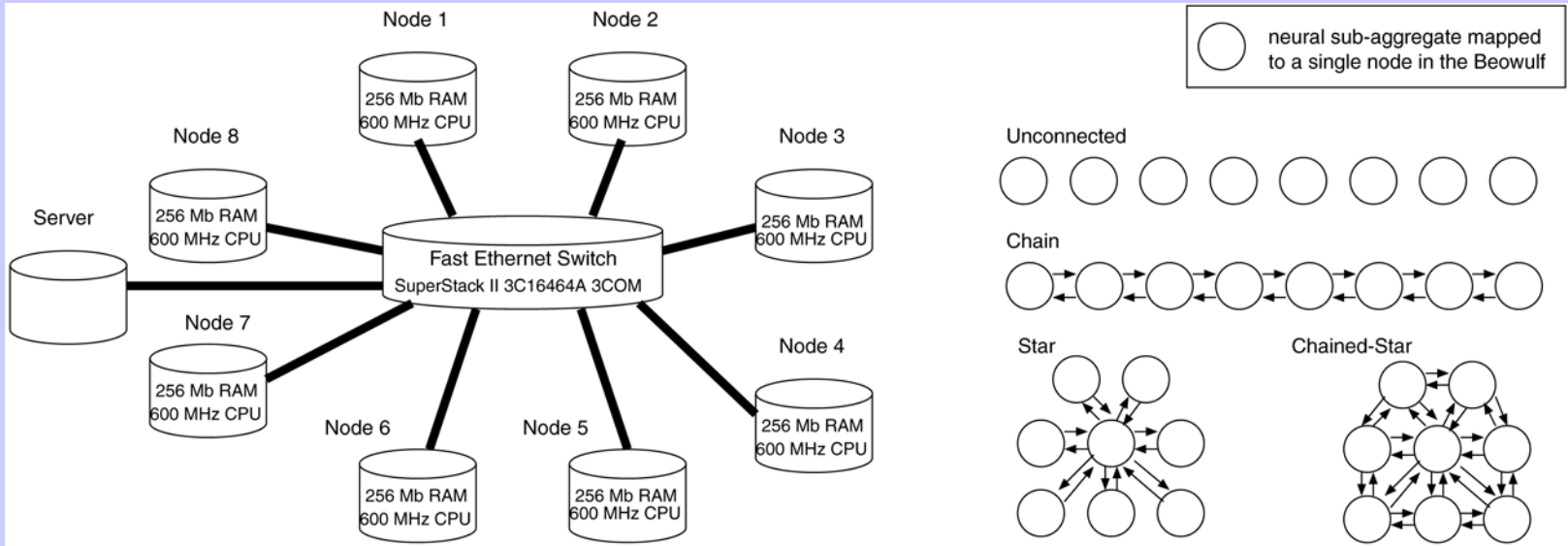
Claverol, Chad, Brown (2002) IEEE Trans. Biomed. Eng.

# Random stimulus response



Claverol, Chad, Brown (2002) IEEE Trans. Biomed. Eng.

# Million cell network on a Beowulf parallel architecture





## **General scientific issues:**

- Standard simulation tools for large-scale networks (section 7.4)
- Database of brain algorithms and structures suited to Neuro-IT:  
reverse engineering of the brain

## **Funding issues (the perspective of a junior scientist returned to Europe)**

- RO1 grants for setting up strong new labs or Neuro-IT institute
- Increase competition amongst universities for researchers