



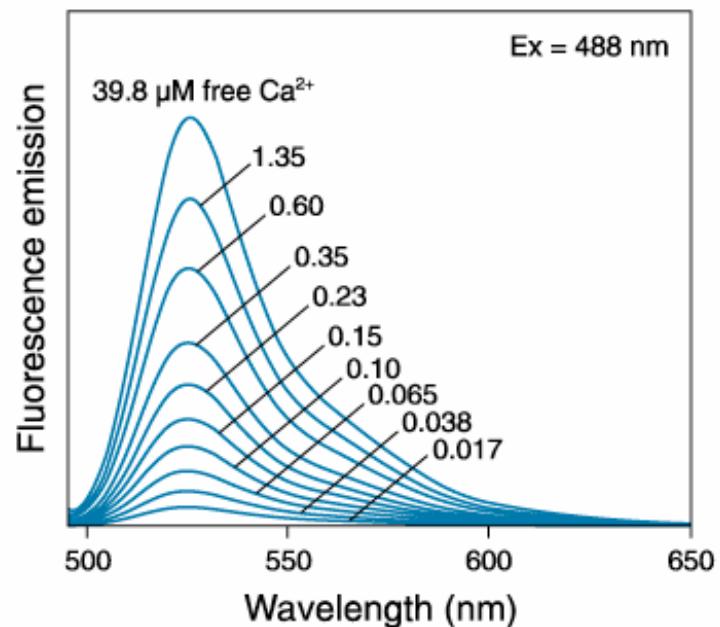
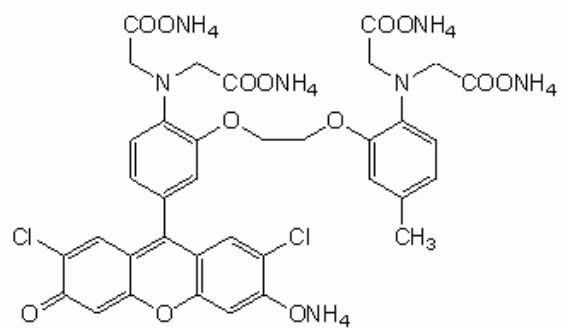
Kalzium:

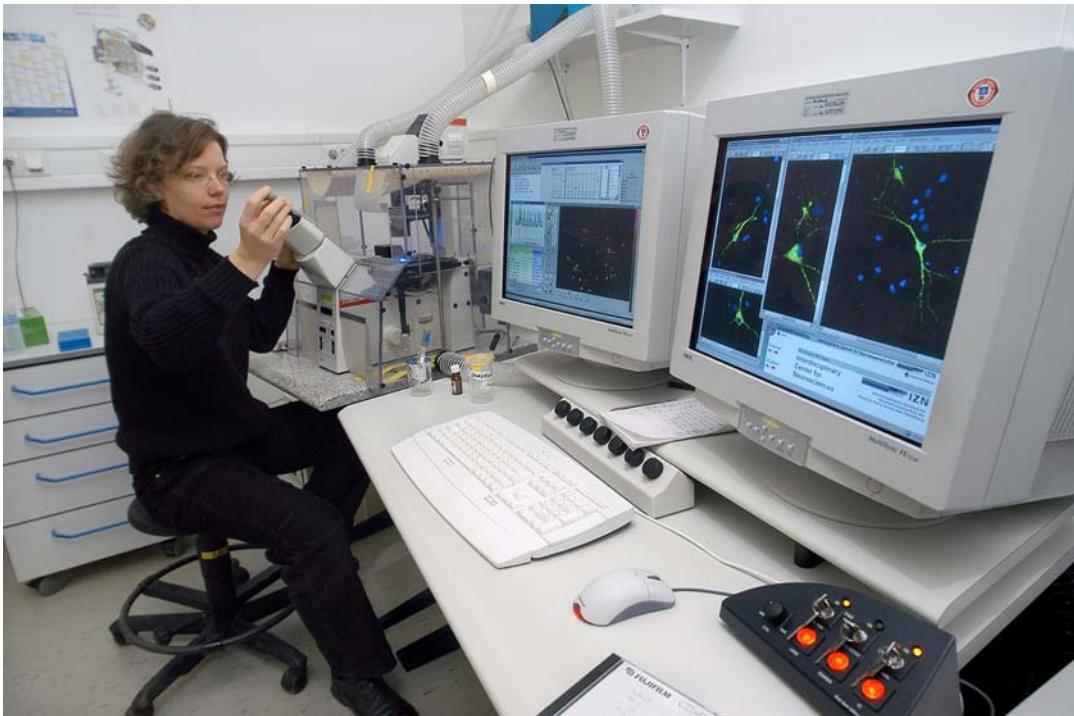
Schalter für Veränderungen im Gehirn

Hilmär Bading

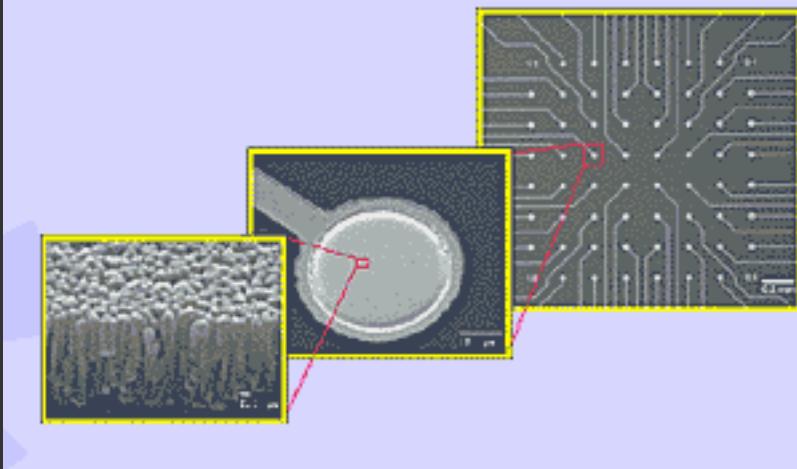
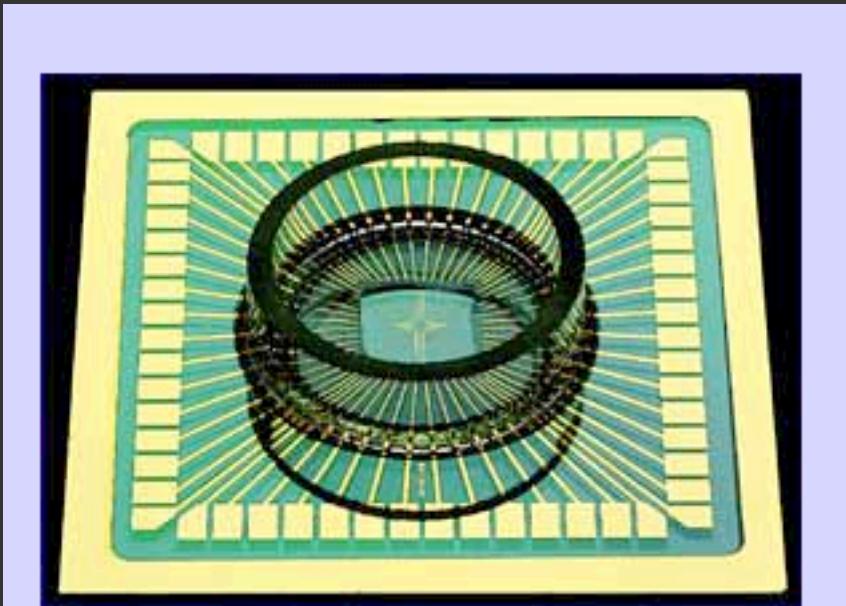
QuickTime™ and a
decompressor
are needed to see this picture.

Calcium indicator Fluo 3

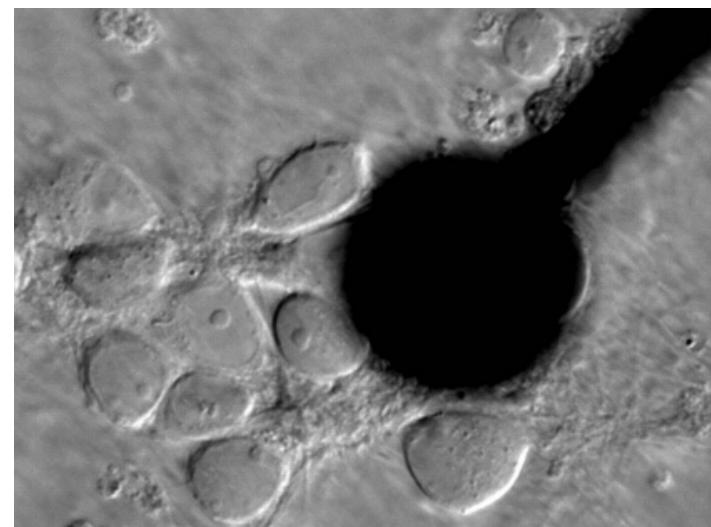
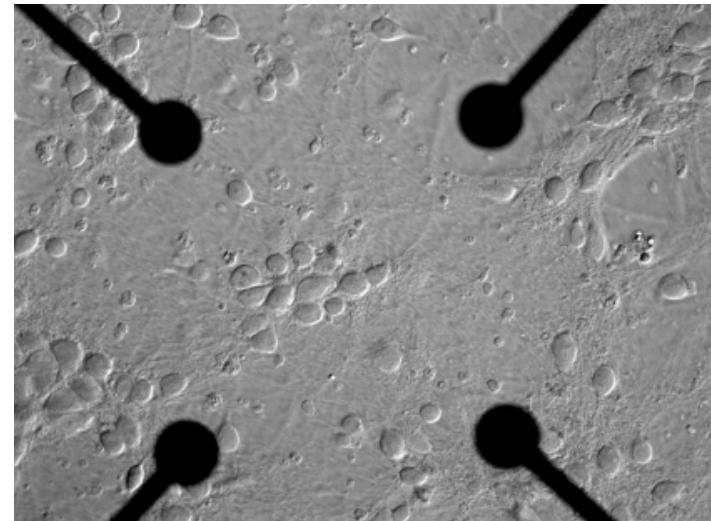
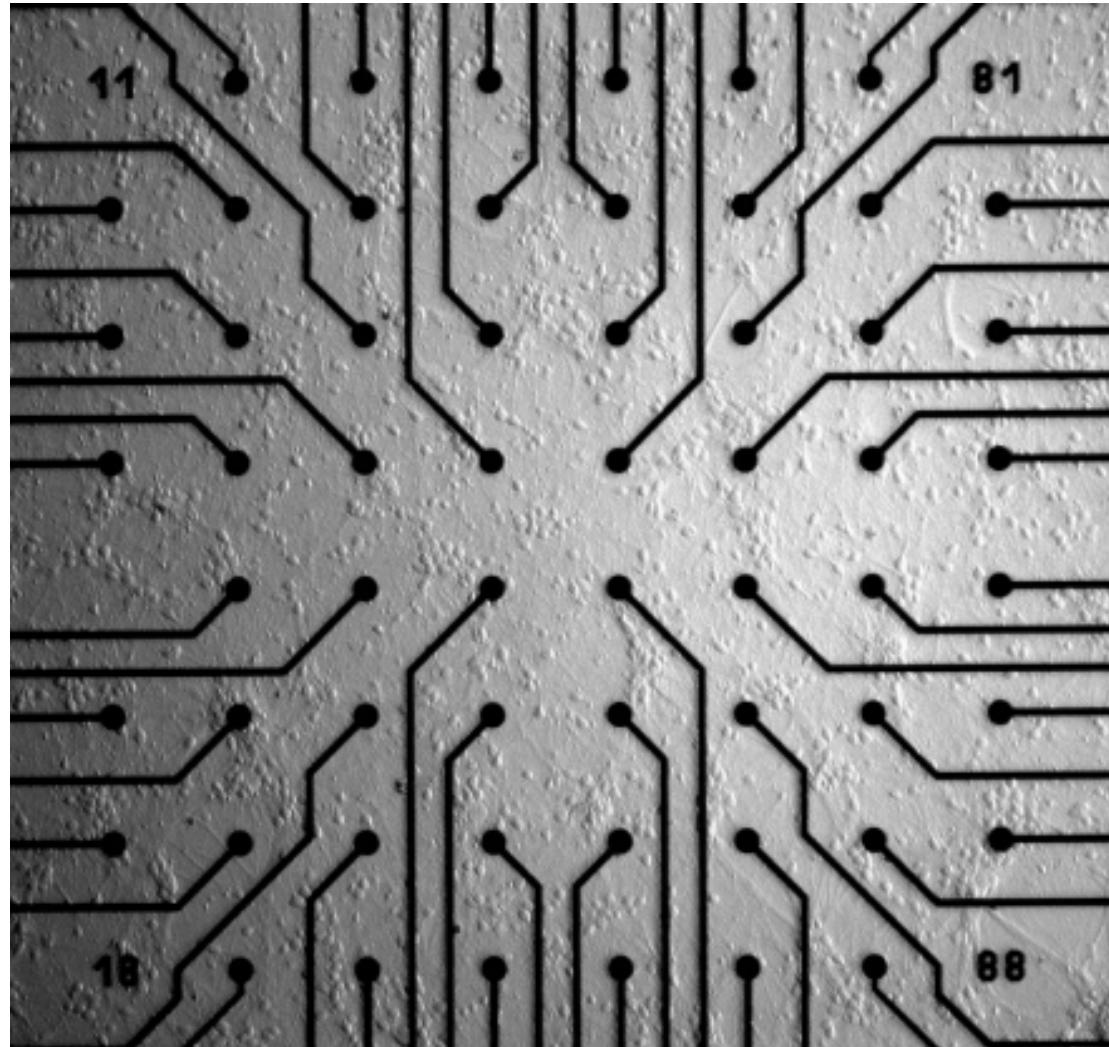


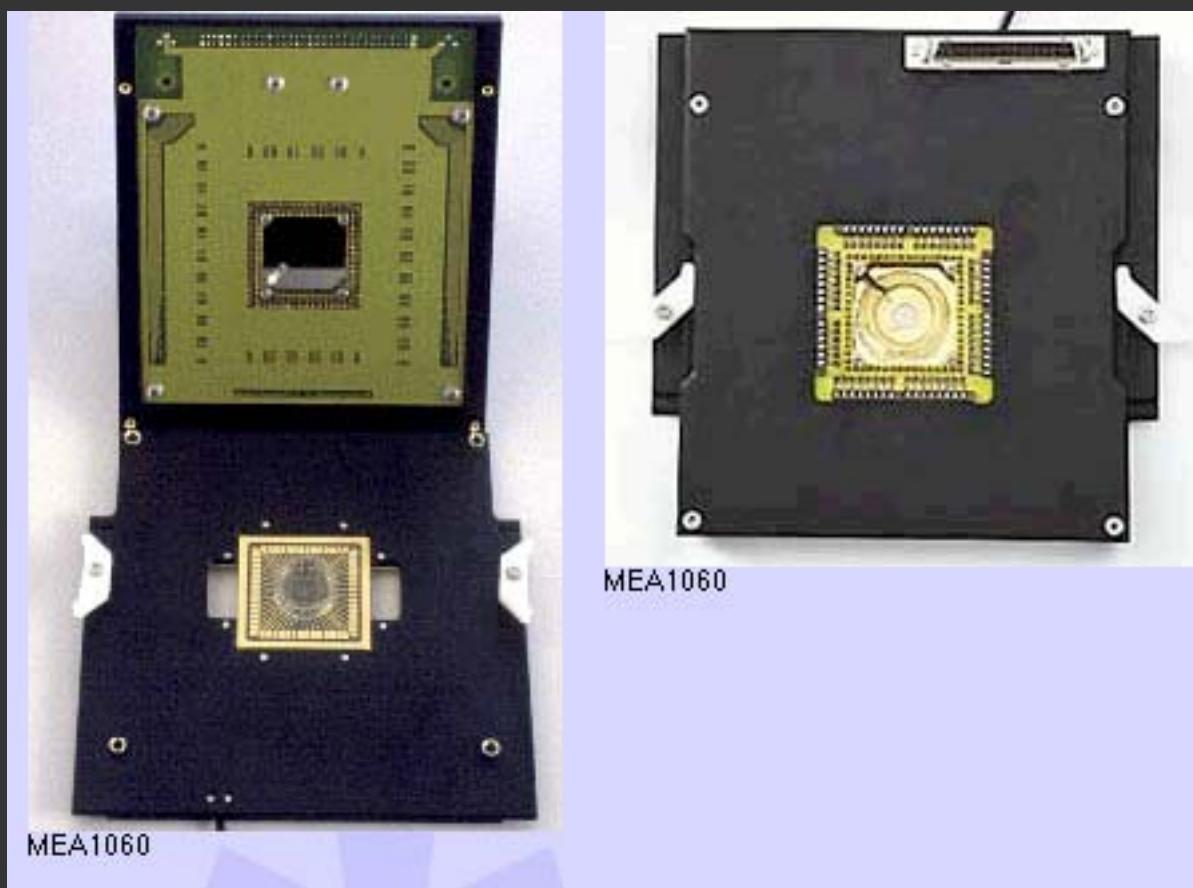


QuickTime™ and a decompressor are needed to see this picture.



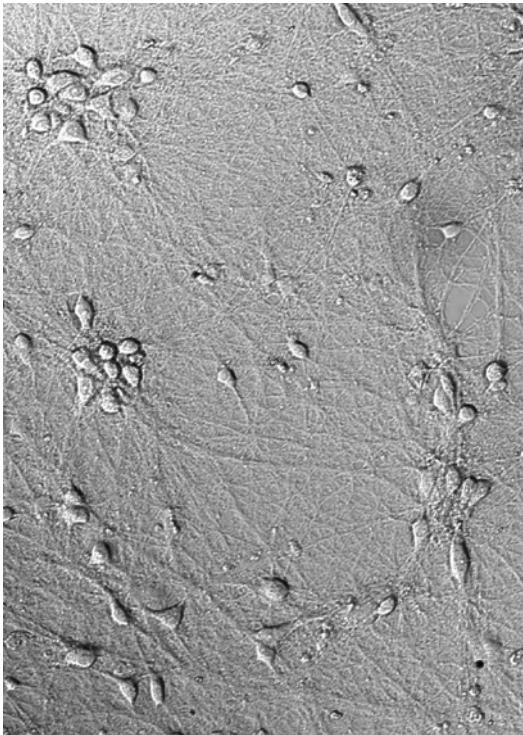
Hippocampal neurons on MEA



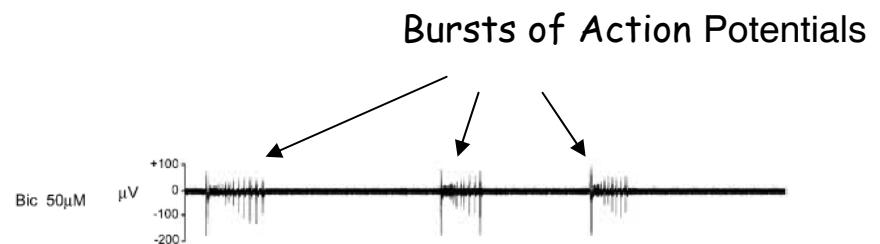




Imaging of Nuclear Calcium Signals in a Network of Hippocampal Neurons



QuickTime™ and a decompressor are needed to see this picture.



Kalzium

Woher kommt es?

Wohin geht es?

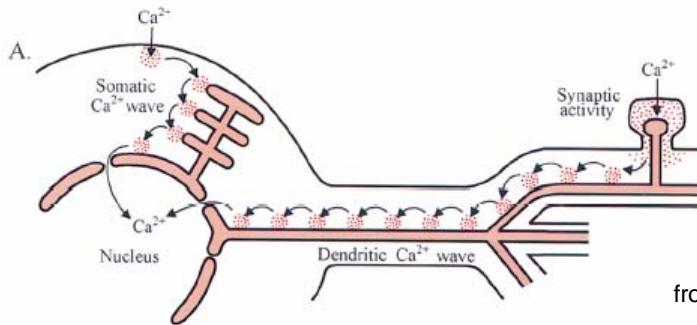
Was macht es?

Kalzium

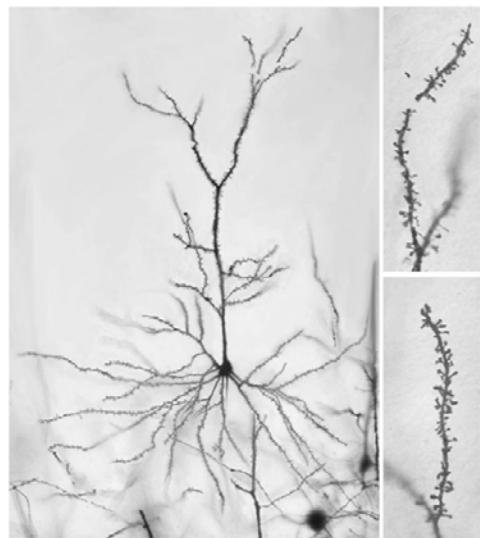
Woher kommt es?

Wohin geht es?

Was macht es?



from Michael Berridge

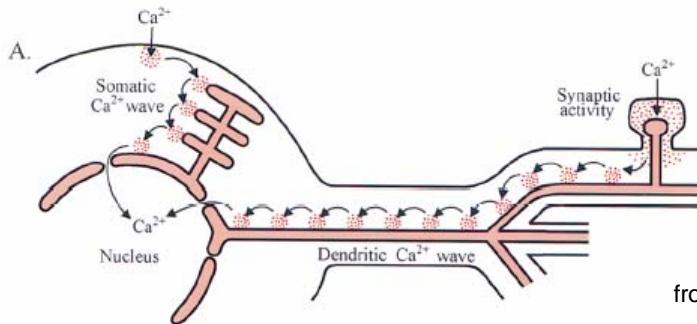


Kalzium

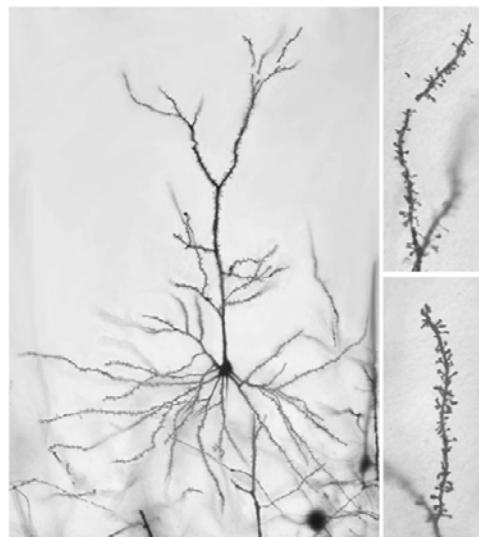
Woher kommt es?

Wohin geht es?

Was macht es?



from Michael Berridge



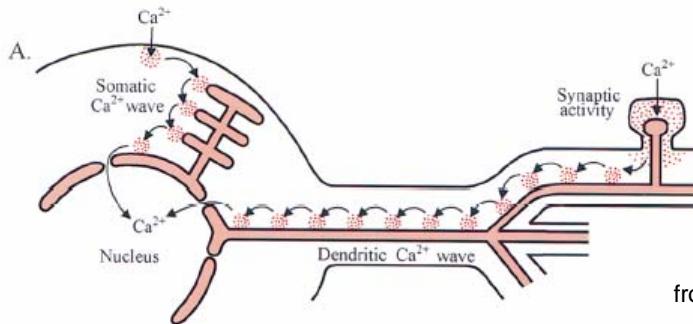
QuickTime™ and a decompressor are needed to see this picture.

Kalzium

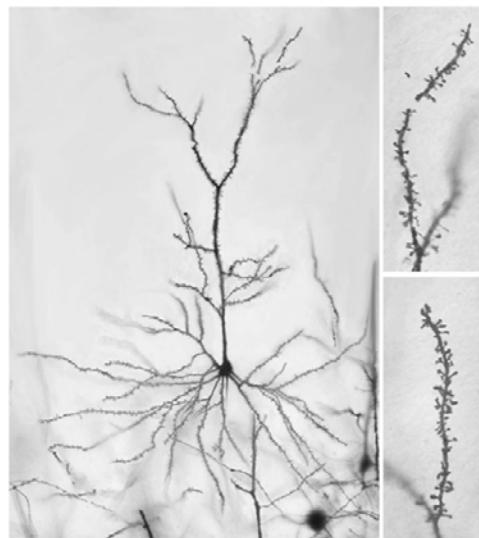
Woher kommt es?

Wohin geht es?

Was macht es?



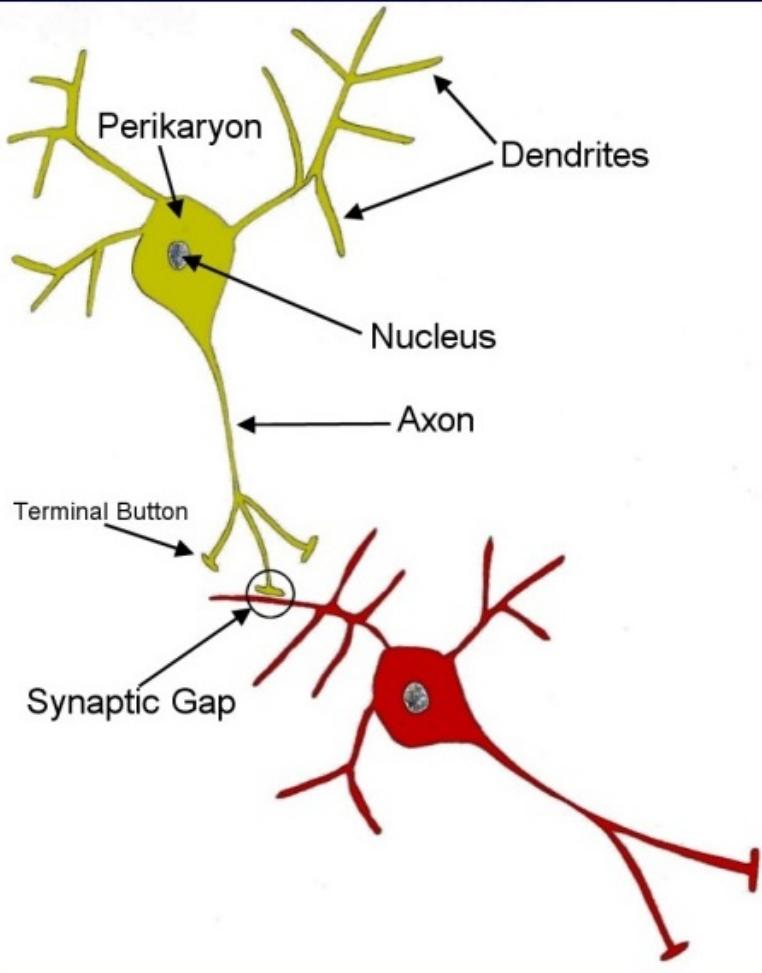
from Michael Berridge



How many neurons are in the brain?

... a million million

1 000 000 000 000

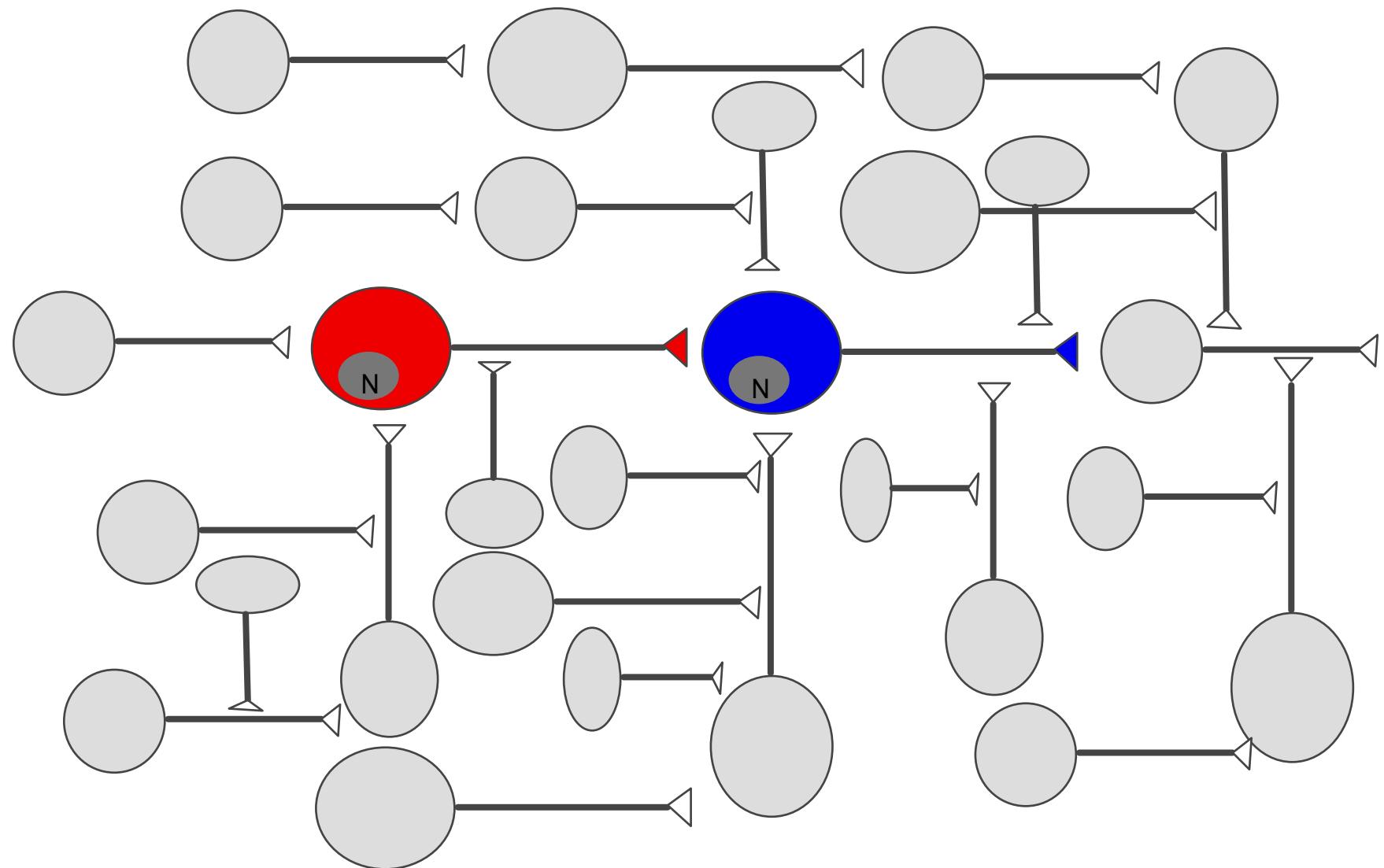


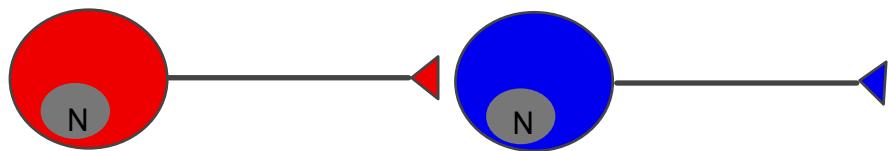
How many connections?

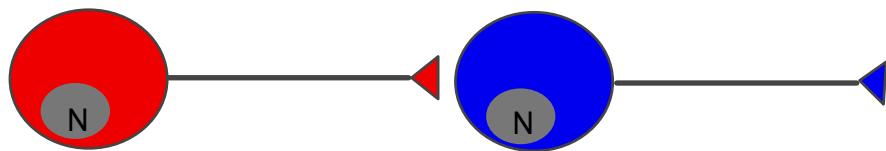
each neuron can have thousands of connections

Estimated total...

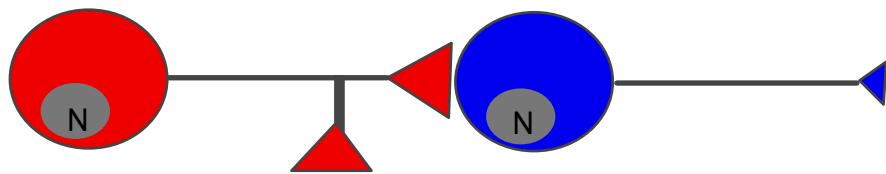
1 000 000 000 000 000



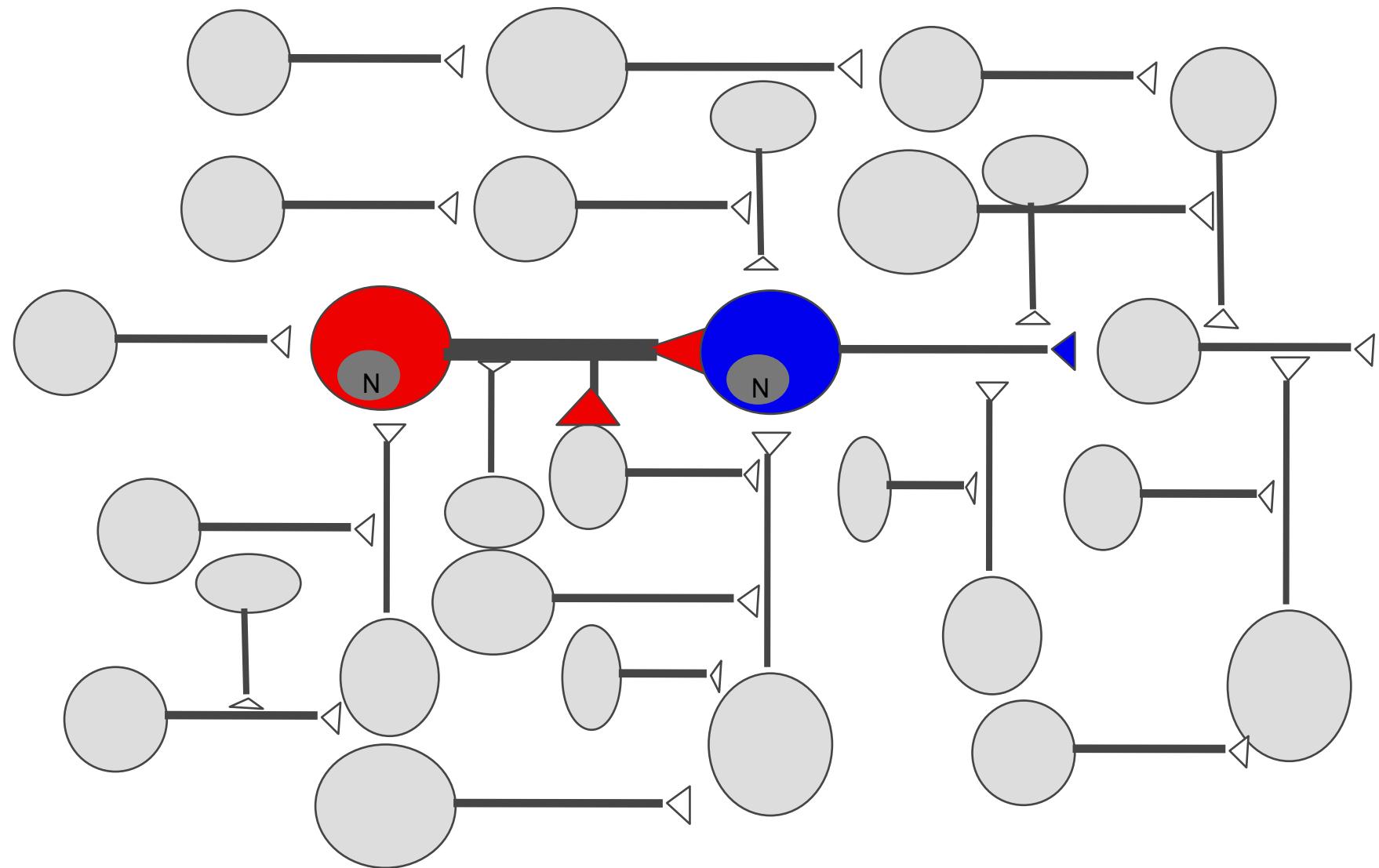


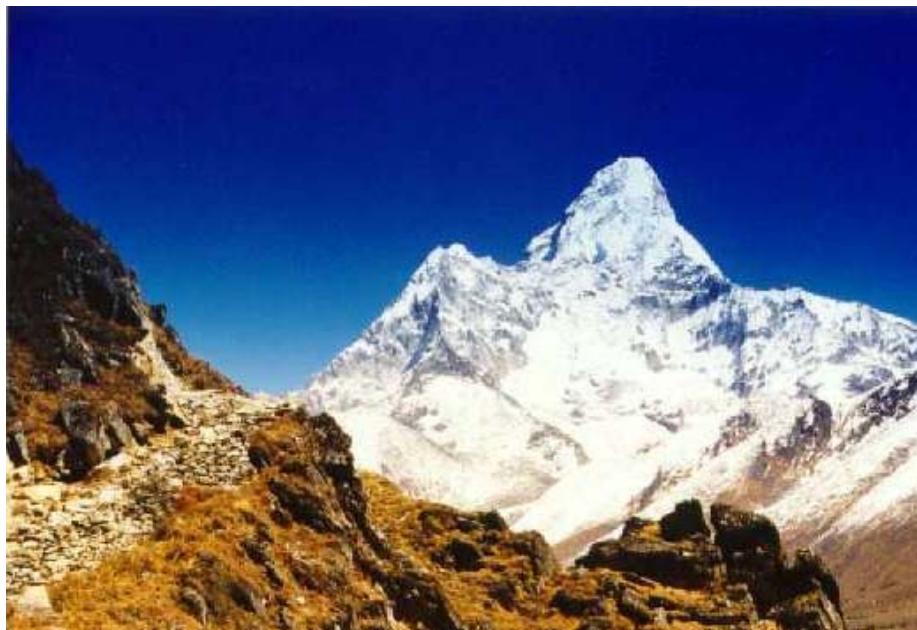


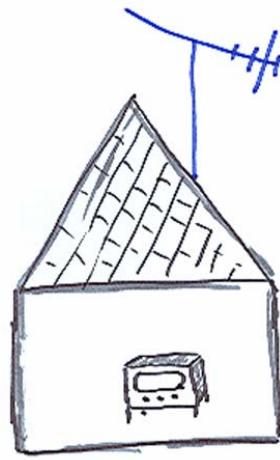
vorher

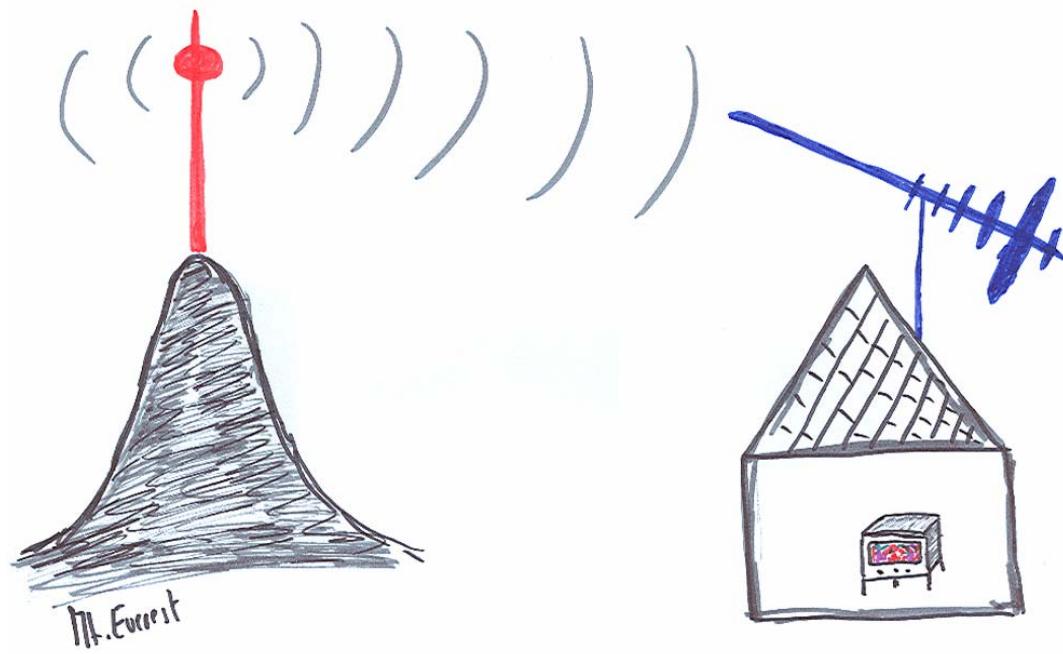


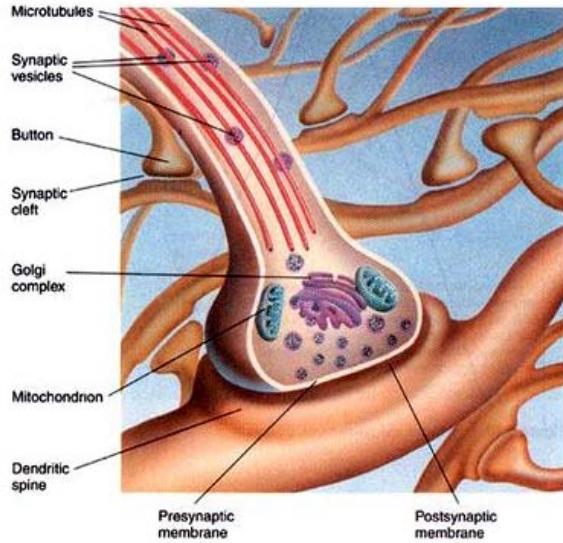
nachher



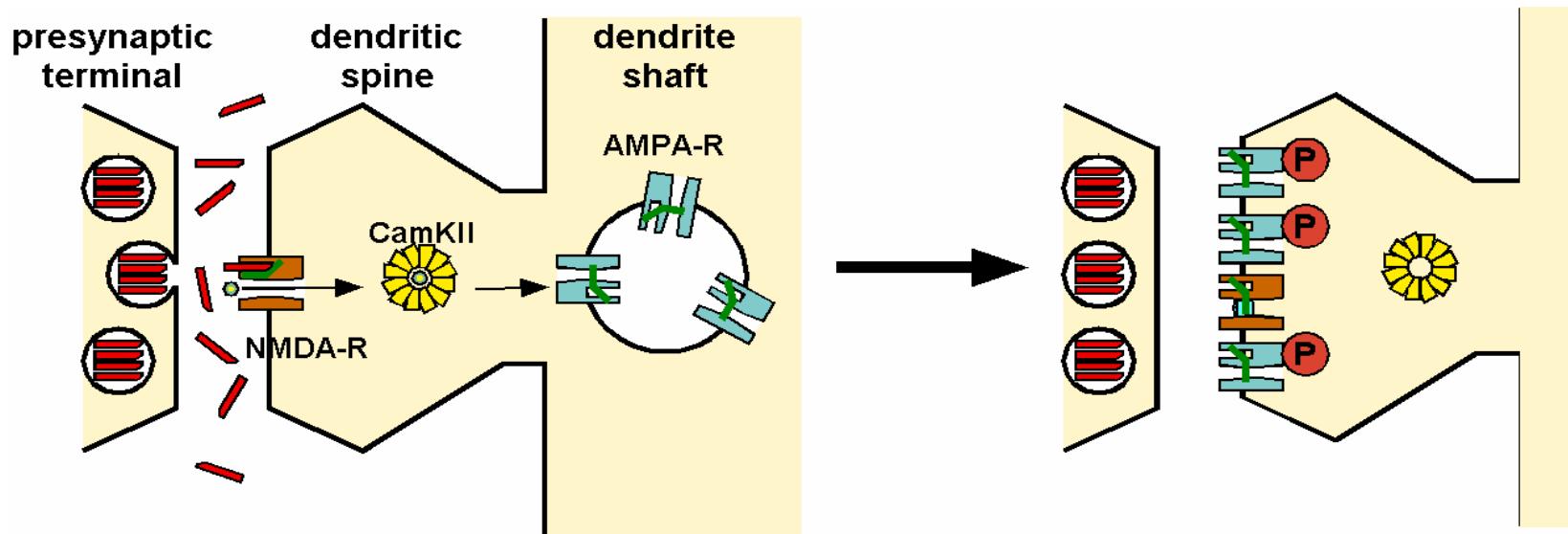








A model for synapse strengthening



Kalzium

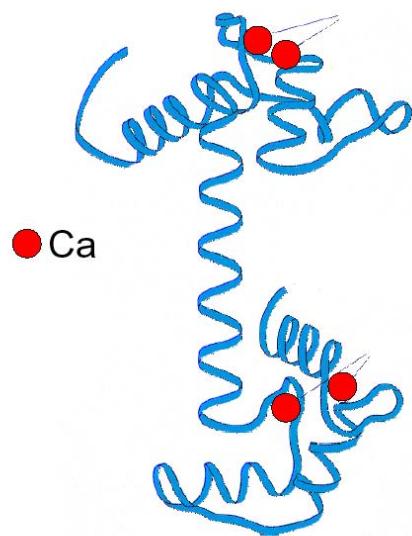
Was macht es: **Veränderungen synaptischer Verbindungen
in neuronalen Netzwerken**

Kalzium

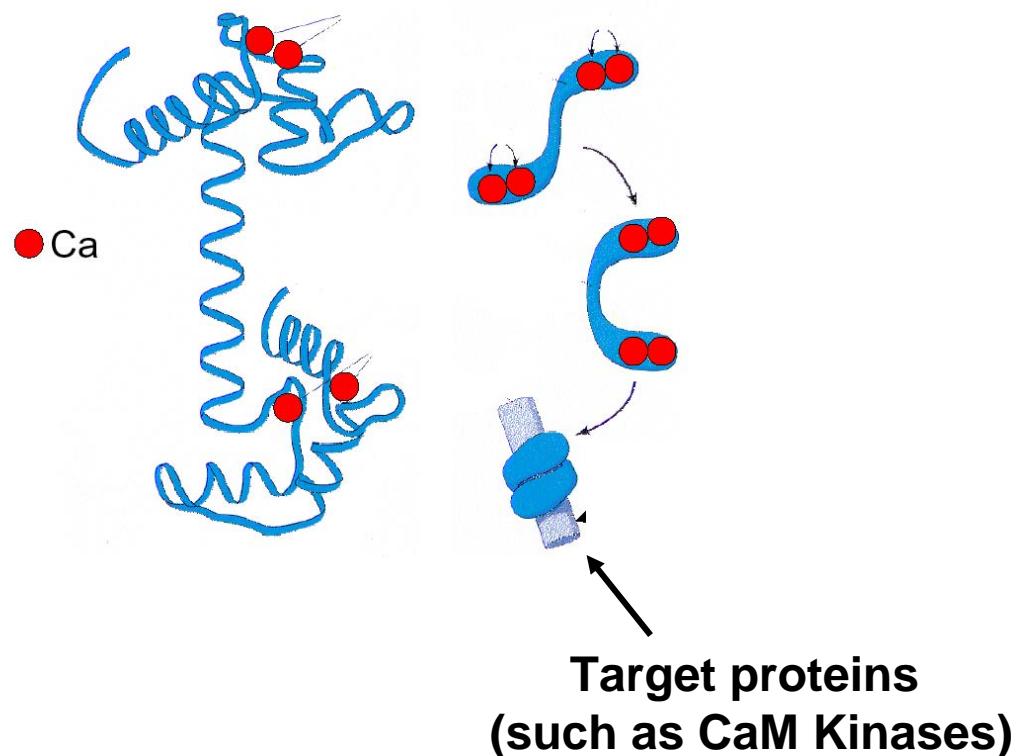
Was macht es: Veränderungen synaptischer Verbindungen
 in neuronalen Netzwerken

Wie macht Kalzium das?

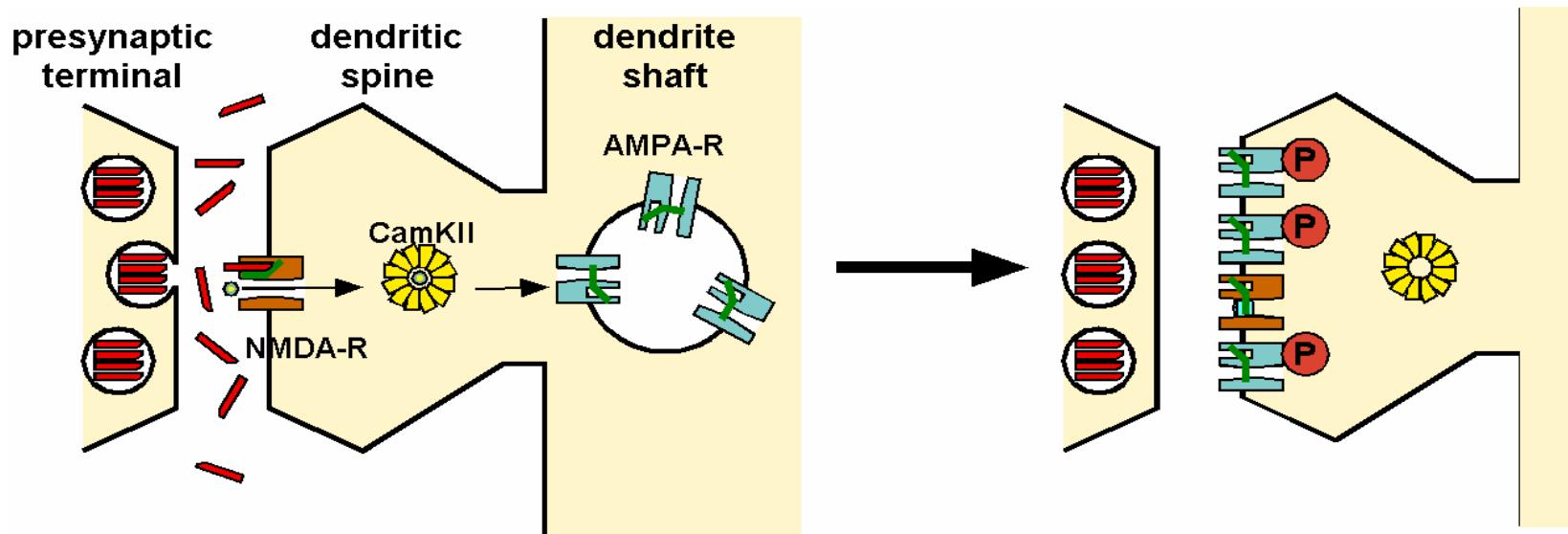
Calmodulin: Principal Calcium Sensor

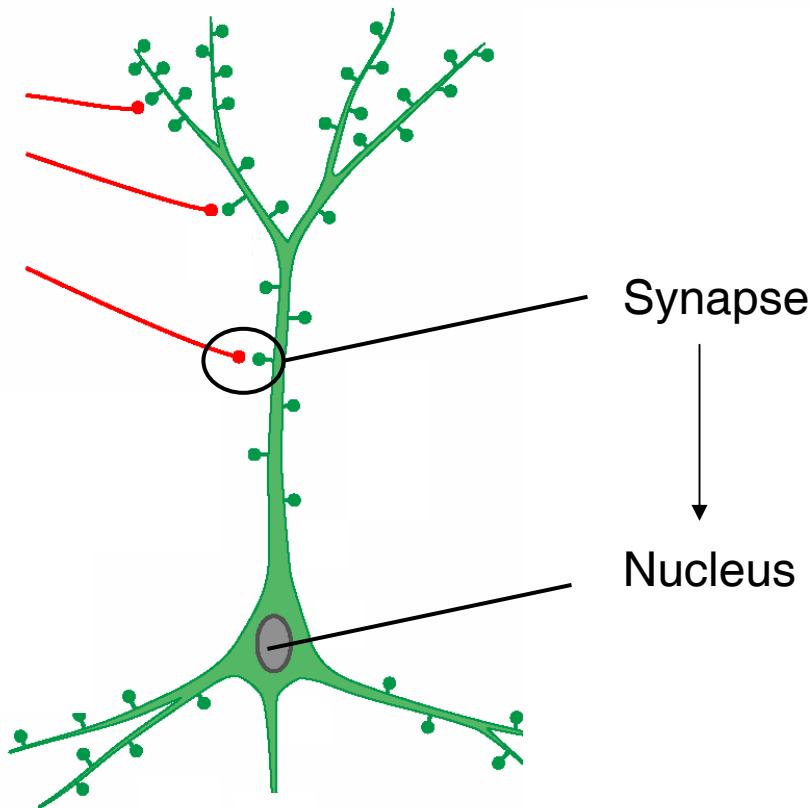


Calmodulin: Principal Calcium Sensor



A model for synapse strengthening



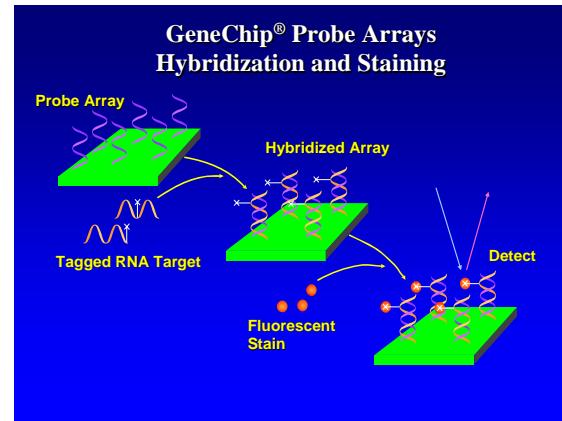
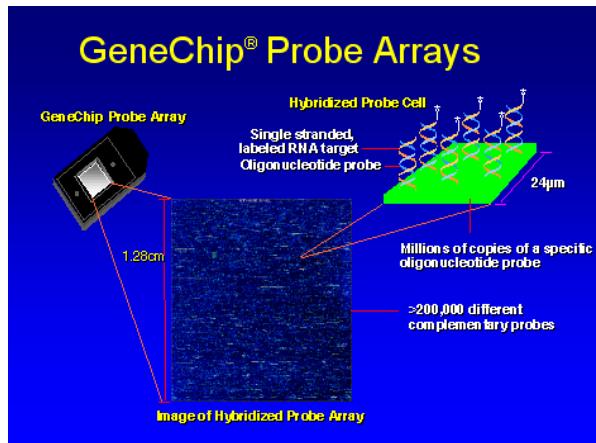


Synapse

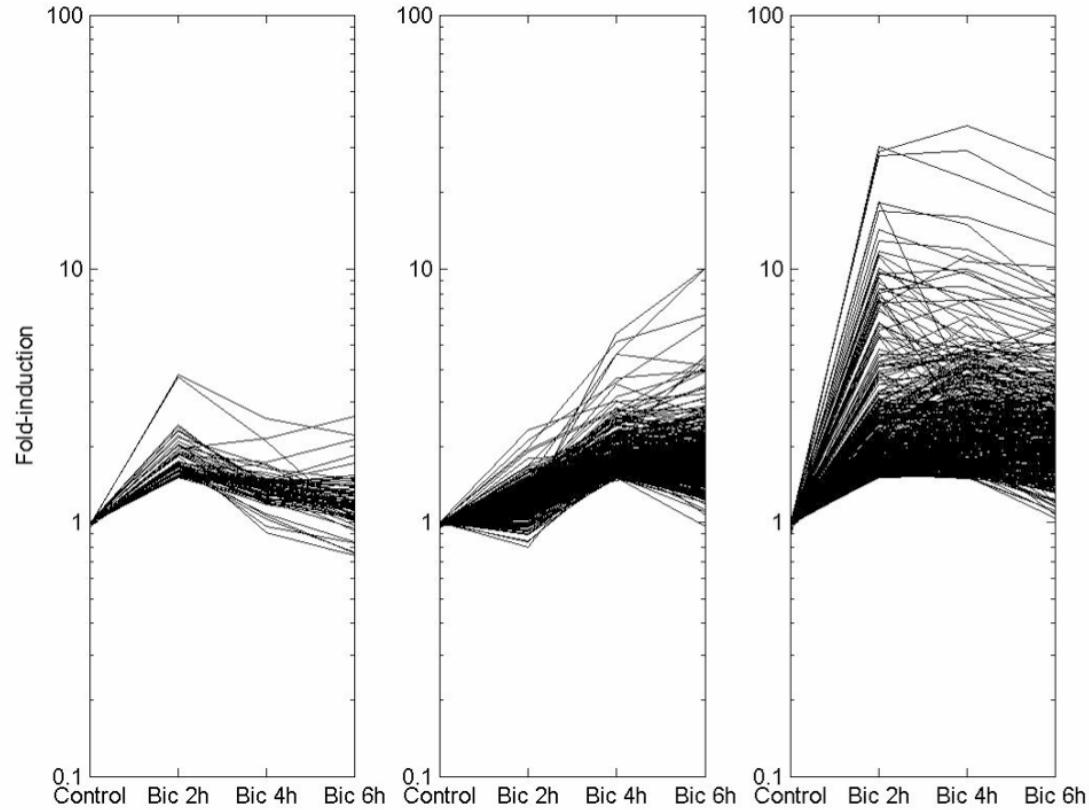
Nucleus



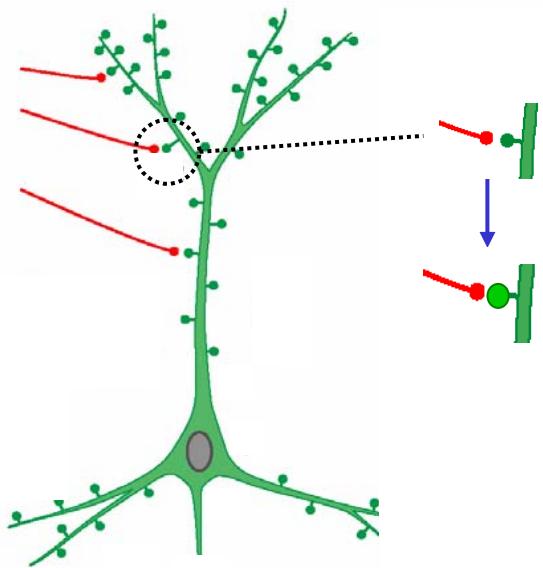
GeneChip® Probe Array



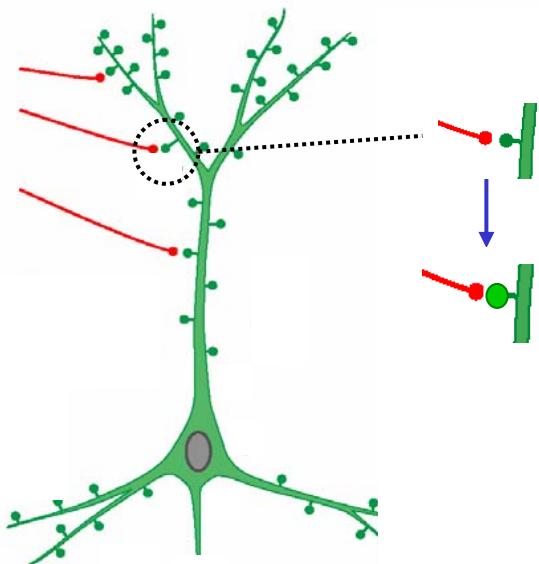
Viele Gene verändern ihre Expression



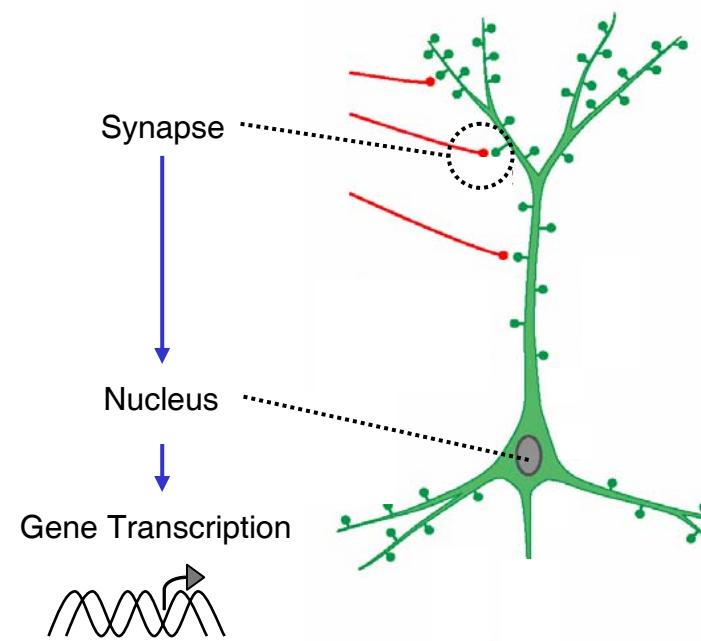
1) Increase in synaptic efficacy



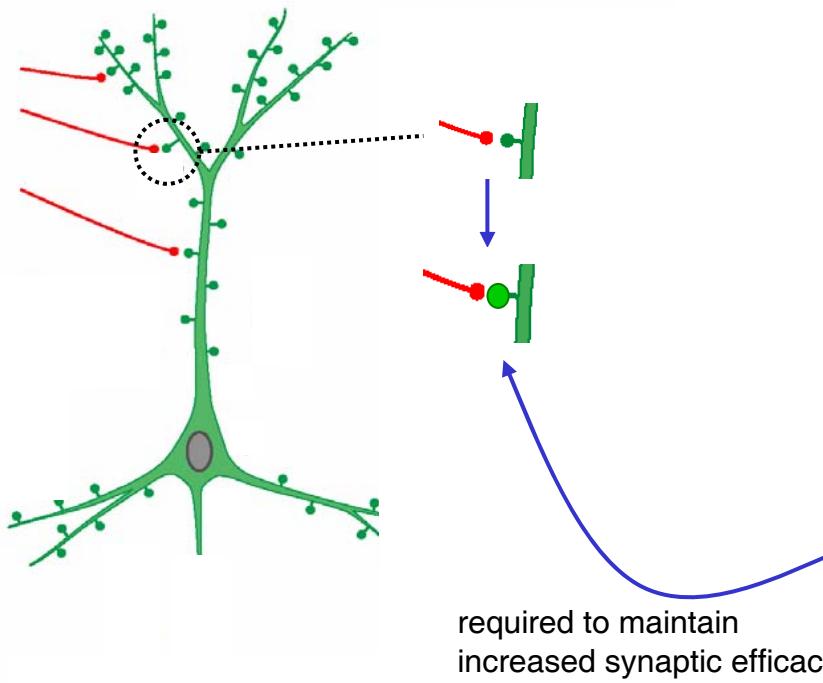
1) Increase in synaptic efficacy



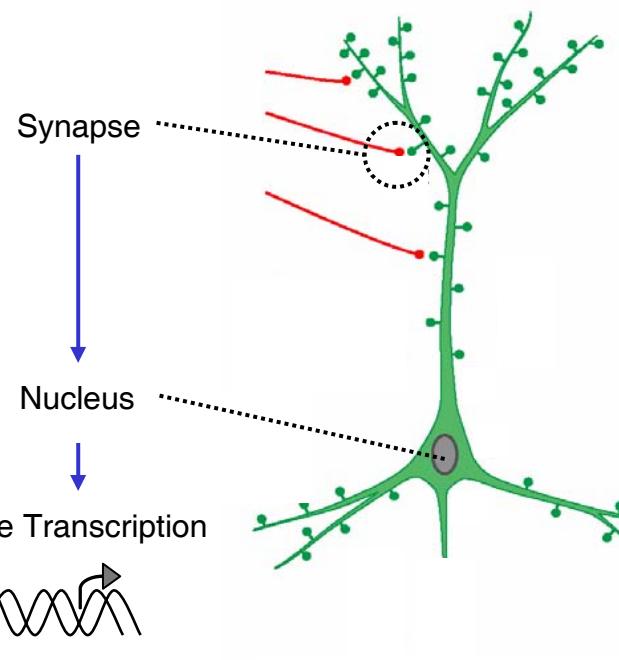
2) Activation of synapse-to-nucleus communication



1) Increase in synaptic efficacy



2) Activation of synapse-to-nucleus communication





Kalzium:

Schalter für Veränderungen im Gehirn



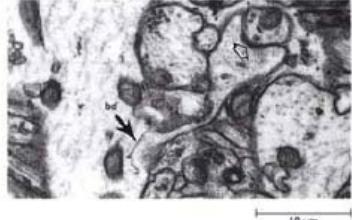
A Thin



B Stubby



C Mushroom



10 μ m

Protein-based Calcium Indicator

