

OG Neuroplasticiteit en Neuroproteomics

Promotor: Prof. Dr. L Arckens

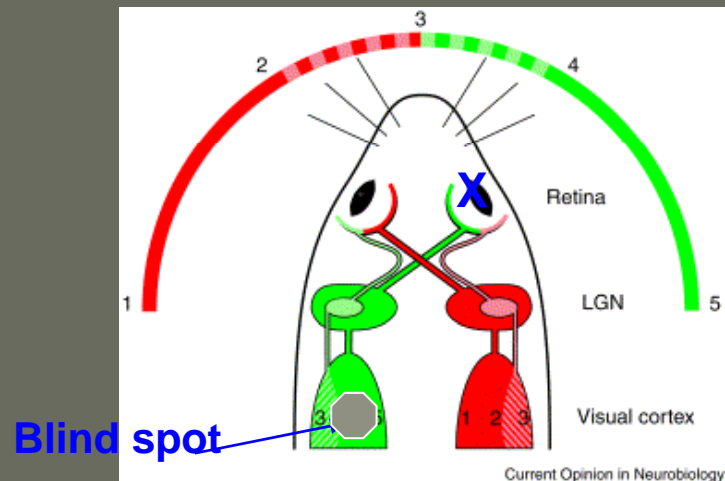
Mechanismen van hersenplasticiteit

*Begeleiders: Julie Nys – Katrien Smolders – Jeroen Aerts – Samme Vreysen
Tariq Ahmed*

Moleculaire mechanismen van hersenplasticiteit

Het effect van sensorische deprivatie op het visueel systeem

Neuronen in de hersenen hebben de mogelijkheid om zich na een letsel te reorganiseren om zo functioneel herstel te bewerkstelligen. In dit onderzoek wordt deze neuroplasticiteit onderzocht in visueel gederpiveerde muizen



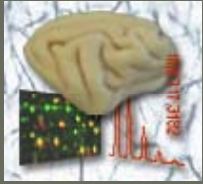
Hoe?

Welke cellen zijn belangrijk? Neuronen? Glia cellen? Bloedvaten?

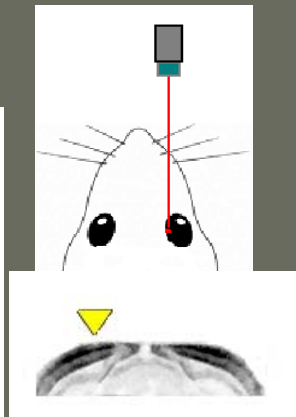
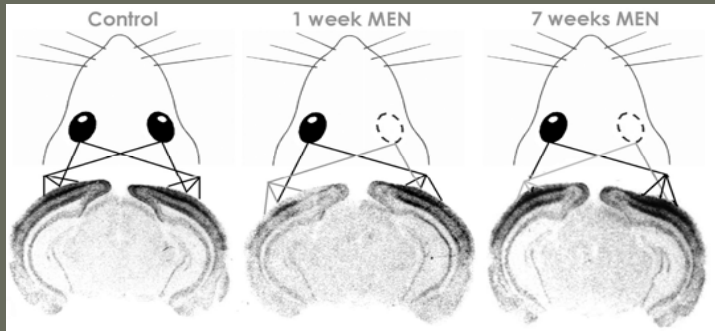
Welke moleculen zijn betrokken? essentieel?

Zijn moleculen uit het immuunsysteem betrokken? Cytokines?

Zijn dezelfde moleculen ook belangrijk bij leren en geheugen?

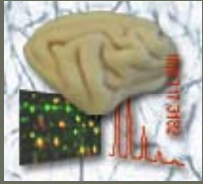


Julie Nys: Characterization of age-dependent cortical plasticity in mouse visual cortex following monocular enucleation



Monocular enucleation

Retinal lesion



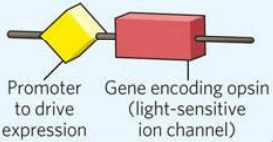
Samme Vreysen: De invloed van celspecifieke micromanipulatie op neurale activiteit bij hersenplasticiteit – Een optogenetische studie in de visuele cortex van de muis.

SIX STEPS TO OPTOGENETICS

With optogenetic techniques, researchers can modulate the activity of targeted neurons using light.

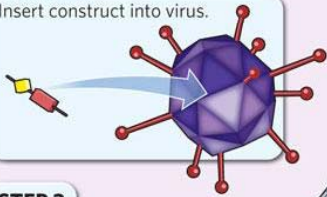
STEP 1

Piece together genetic construct.



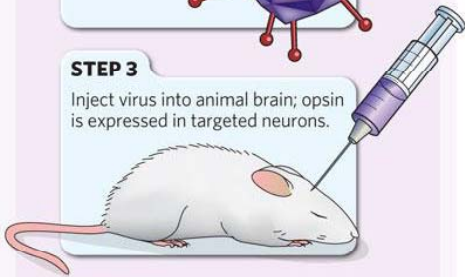
STEP 2

Insert construct into virus.



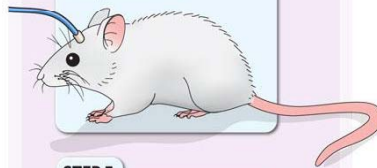
STEP 3

Inject virus into animal brain; opsin is expressed in targeted neurons.



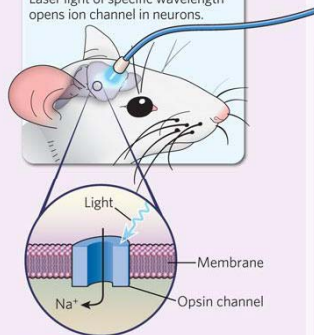
STEP 4

Insert 'optrode', fibre-optic cable plus electrode.



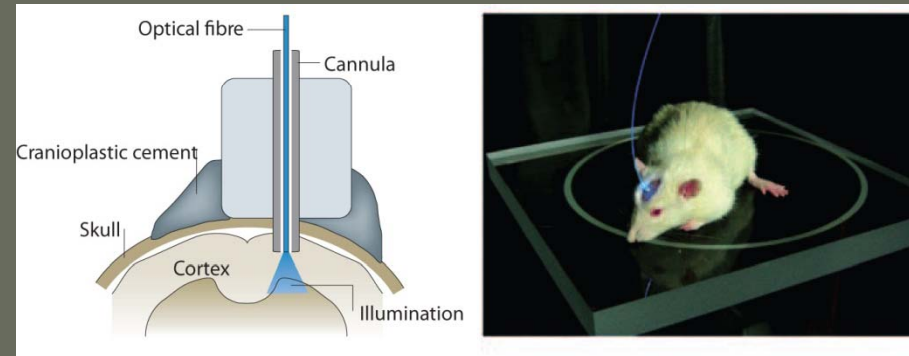
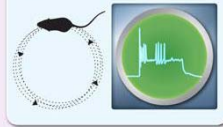
STEP 5

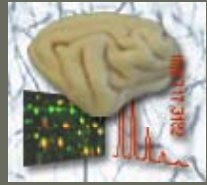
Laser light of specific wavelength opens ion channel in neurons.



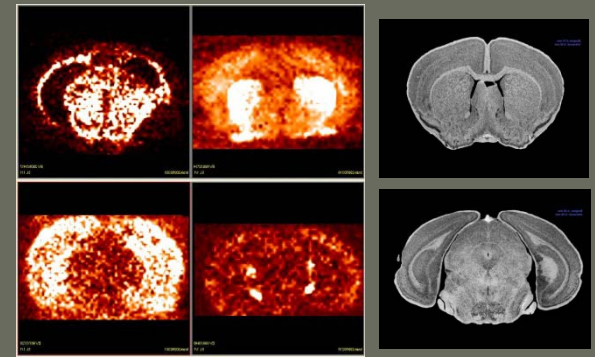
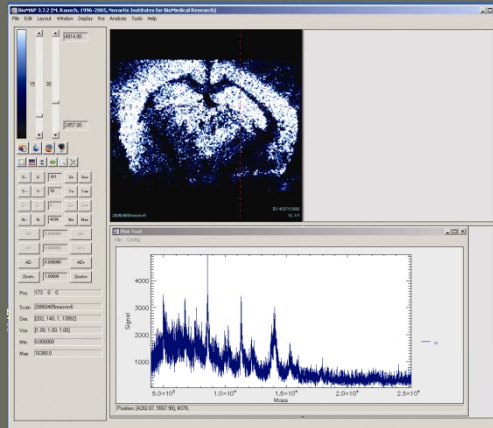
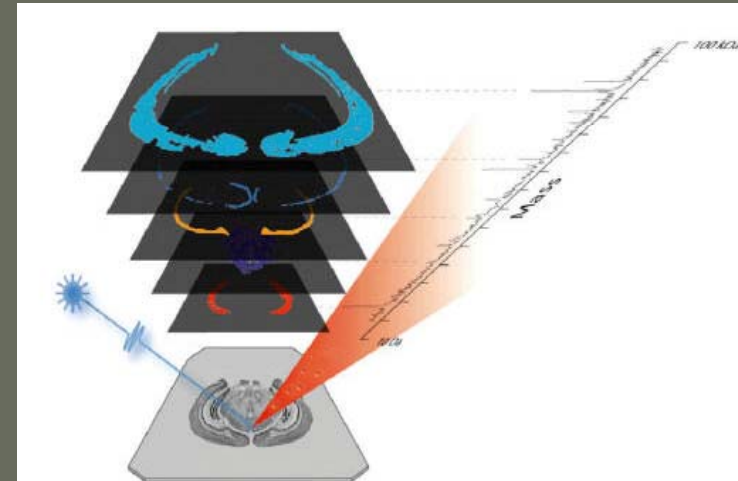
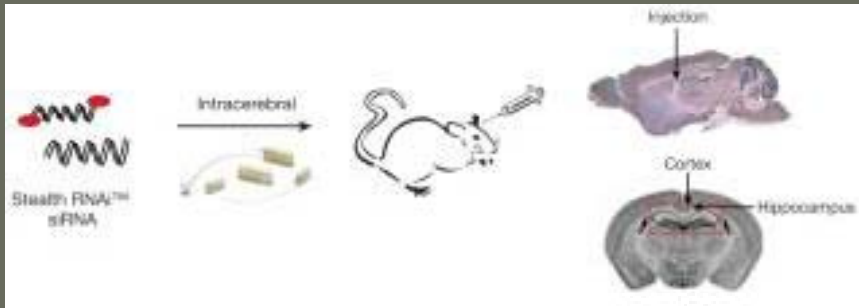
STEP 6

Record electrophysiological and behavioural results.



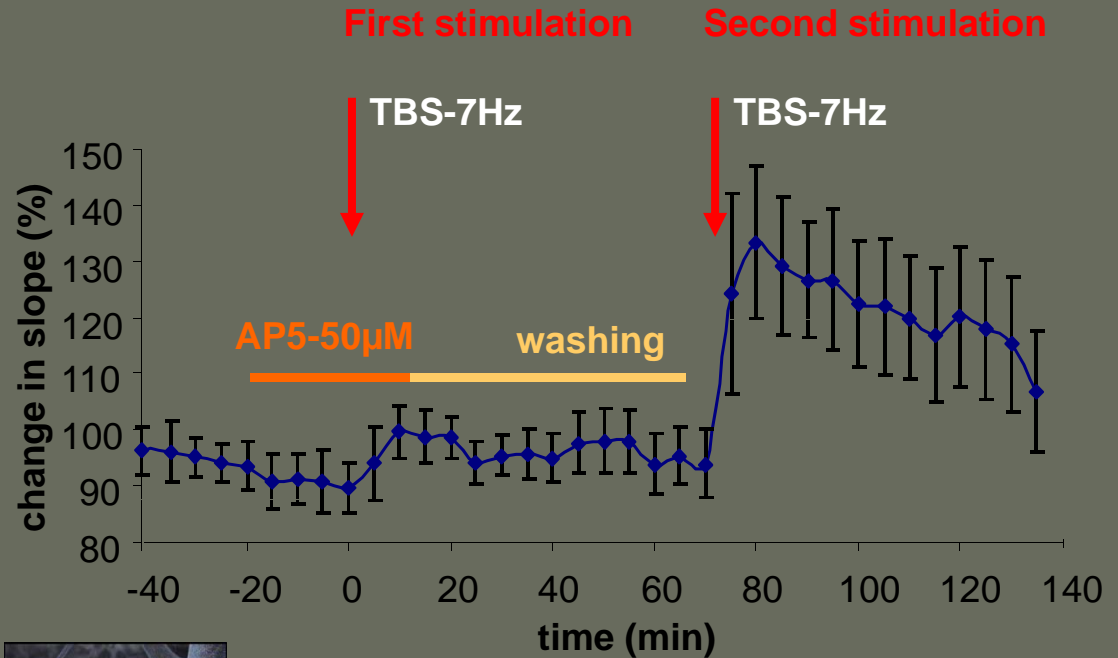
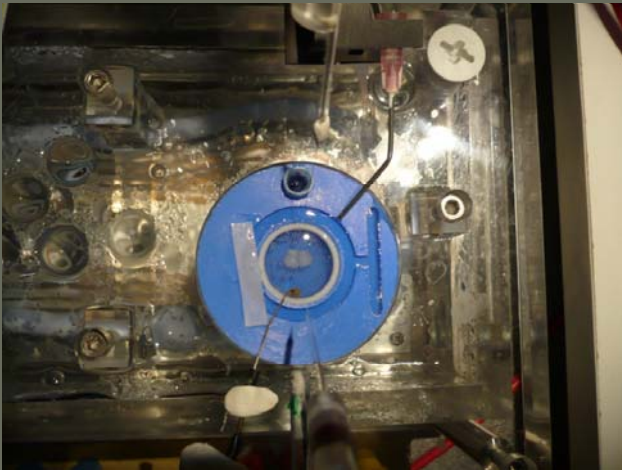
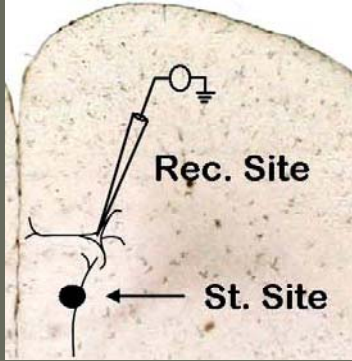
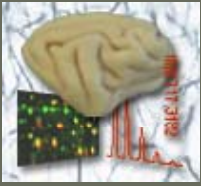


Jeroen Aerts: The functional role of MMP3 in brain plasticity in response to visual deficits



Tariq Ahmed: Molecular changes associated with an in vitro model of learning

LTD in hippocampal slices



Hoe veranderen de expressiepatronen voor zif/Arc?
LTD en CREB signaalweg?