Pherosys Days, Versailles, 23-24 June 2009

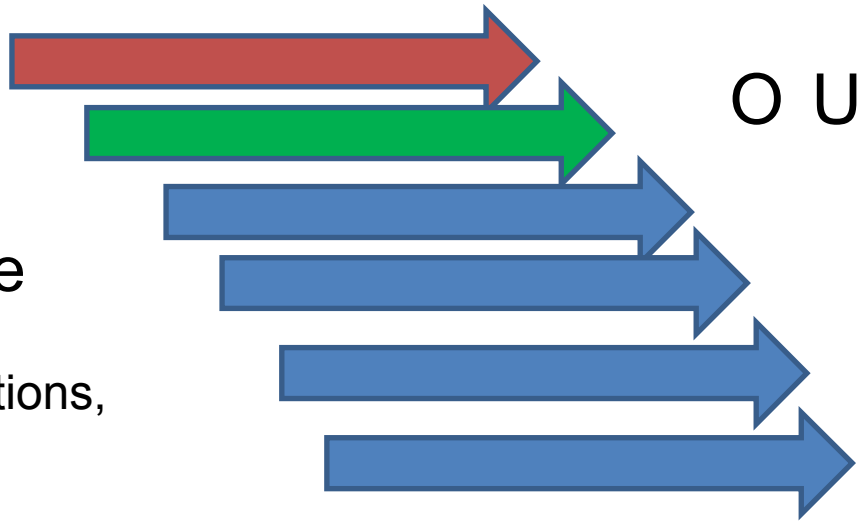
WP1. ANTENNAL INPUT TO THE ANTENNAL LOBE

AIM: Reconstructing the global input of the pheromonal ORN population to the brain in natural and experimental conditions (prerequisite for WP2 and WP3)

Population of ORNs
Different locations
Different sensitivities
Different optimum stimulus

INPUT

OUTPUT



Pheromone
components,
relative concentrations,
time course

MGC
Spatio-temporal
pattern of spikes

WP1. ANTENNAL INPUT TO THE ANTENNAL LOBE

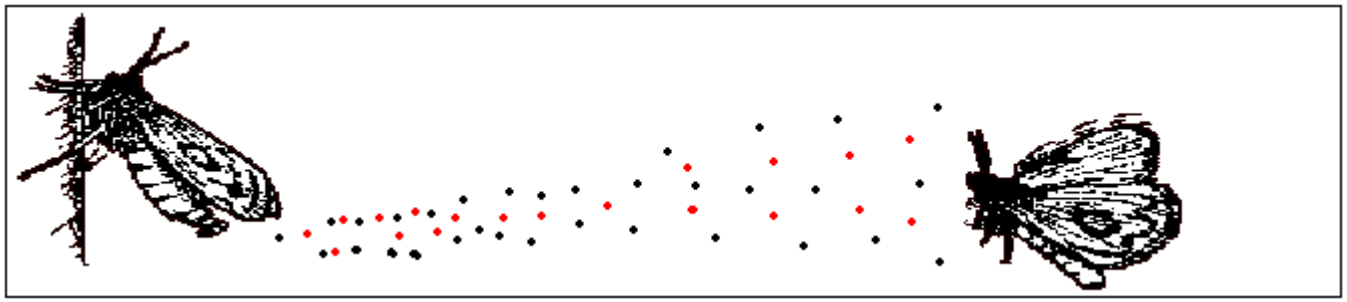
AIM : Reconstructing the global input of the pheromonal ORN population to the brain in natural and experimental conditions (prerequisite for WP2 and WP3)

Leader: INRA Versailles

Tak 1a : Single ORN investigations

Task 1b : Population of ORNs

Task 1c: Projection of ORN and MGC organization



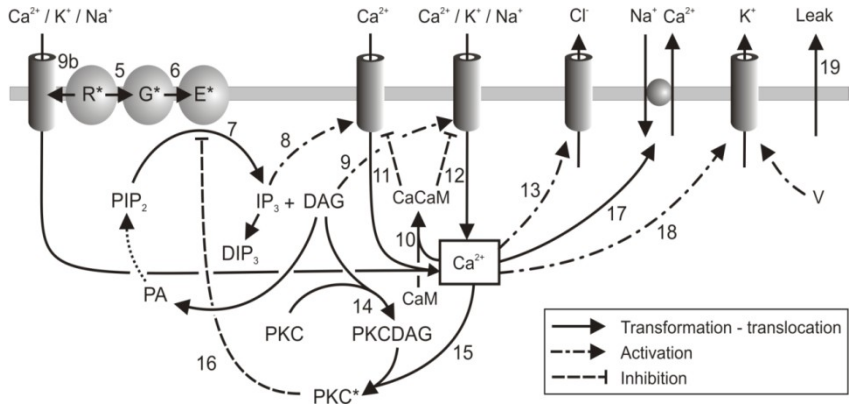
Task 1a: Single ORN investigations

Aim: Modelling ORN responses *in situ*

Investigators: **Yuqiao GU** (postdoc), Philippe LUCAS, Jean-Pierre ROSPARS

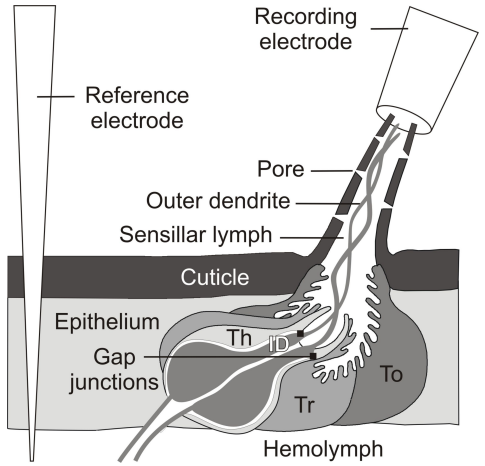
Stimulus → Receptor potential RP → Action potentials AP

a. Time: Intracellular processes



Stim → R → G → E → DAG → channels → currents → RP

b. Time & space: Outer dendrite + sensillum



c. Axon-potential generation

6 voltage-dependent channels

In the inner dendrite-soma-axon region

d. Technical problems:

Parameter identification

Sensitivity analysis

Task 1b: Population of pheromone-responsive ORNs

Aim: Describe evoked spike trains of pheromone-responsive ORNs

Correlation with RP. Intra- and inter-ORN variabilities.

Investigators: D. JARRIAULT (PhD), **A. GREMIAUX**, P. LUCAS, J.-P. ROSPARS, S. ANTON

a. First series: *in vivo*, *Agrotis*, APs, few doses.
Experiments by David, further analyzed by Alexandre

b. Second series: *in vivo*, *Spodopera*, RP + APs, more doses (in progress)
Experiments by Quentin Geissmann (M1 student) with P. Lucas

Stimuli:

Single pheromone component (major compound)

Square pulse of short duration

Different doses

In the future: different durations + periodic + others

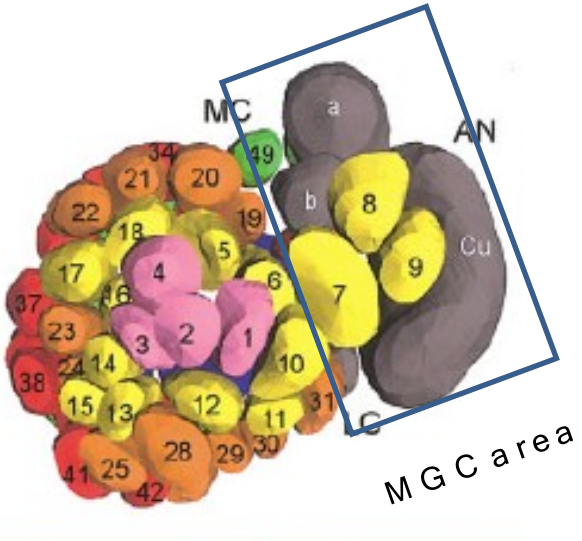
Experiments → Statistical study → Model of input to AL

Task 1c: Projection of ORNs and MGC organization

Aim: Describe the structure of the MacroGlomerular Complex (MGC)

Investigators: Louise COUTON, David JARRIAULT, Nina DEISIG, Sylvia ANTON, J.-P. ROSPARS

Spodoptera littoralis



Sex pheromone has 3 components.

What are the glomeruli in which pheromone-responsive neurons project ?

Major component (Z7-12:Ac) → Cumulus Cu

Minor components → 2 identified glomeruli

Behavioural antagonist ? → 1 unstained glomerulus

Work multiple contributions:

- Neuroanatomy (glomeruli)
- Neuroanatomy (single neurons)
- Calcium imaging
- Electrophysiological recordings

(Paper in project)

WP1. DELIVERABLES AND MILESTONES

Pherosys = 3 years = 13.05.2008 to 12.05.2011 (extended 31.12.2011)

Done in 2008 / Present / Next (end 2009) / 2010-11

Deliverables

D1.1 First model of receptor-potential generation	month 8	end 2008
D1.2 Structure of MGC from single-ORN staining in confocal	month 12	mid 2009
D1.3 Report on integrated model of sensillum	month 18	end 2009
D1.4 First model of pheromonal message sent to brain (static dose-response curves)	month 24	mid 2010
D1.5 Report on neuronal and synaptic organization of MGC	month 24	mid 2010
D1.6 Report on model of pheromonal message sent to brain (from dose-response curves & periodic-pulses)	month 36	end 2011

Milestones

M1.1 Integrated model of pheromone ORN and sensillum	month 20	end 2009
M1.2 Model of MGC organization	month 27	mid 2010
M1.3 Model of olfactory input to AL based on ORN typology	month 36	end 2011