

GABBA

Graduate Program in Areas of Basic and Applied Biology

Universidade do Porto

Neuroscience Module

- Introduction to Neuroscience –

Organizers

Albino J. Oliveira-Maia

Rui M. Costa

Dates and Venue

May 28th to June 1st 2012

Champalimaud Centre for the Unknown

Lisbon, Portugal

Goals

The study of neuroscience has become truly multidisciplinary in recent years, integrating a considerable array of technologies and approaches into a science aimed at understanding how the brain comes to perceive, acquire and use information. Although molecular, systems and cognitive neuroscience will continue to prosper on their own, there is a growing sense that integration of these fields is inevitable. Recently, powerful tools emerging from molecular genetics, electrophysiology and brain imaging have offered novel perspectives to the study of the brain, and their use has led to an unprecedented ability to both manipulate and observe brain phenomena, across levels of biological complexity. In this module, we will highlight recent findings that document this exciting convergence between molecular, cellular, systems and computational neuroscience, focusing particularly in central control of feeding, fear conditioning and sensorimotor integration, across different species.

Lecturers

Andreas Luthi; Friedrich Miescher Institute for Biomedical Research

<http://www.fmi.ch/research/groupleader/?group=35>

Albino Oliveira-Maia; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/costa/people/collaborators>

Carlos Ribeiro; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/ribeiro/start>

Eugenia Chiappe; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/chiappe/start>

Inbal Israely; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/israely/start>

Gerald Rubin; Howard Hughes Medical Inst., Janelia Farm Research Campus.

<http://www.janelia.org/lab/rubin-lab>

Marta Moita; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/moita/start>

Michael Orger; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/orger/start>

Rui Costa; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/costa/start>

Susana Lima; Champalimaud Neuroscience Program

<http://www.neuro.fchampalimaud.org/research/lima/start>

Schedule

The Module will consist of lectures and workshops or demonstrations, held in the morning and early afternoon. On each day, at the end of the afternoon, students (in groups of 2 or 3) are expected to present a paper proposed by the lecturers to showcase a particular finding or experimental approach, and thus promote discussion. Evaluation for the course will depend on this presentation.

Papers for discussion

Monday: Han JH et al, 'Selective erasure of a fear memory', *Science*. 2009 Mar 13;323(5920):1492-6.

Mafalda Almeida, António Pinto Almeida and João Arezes

Tuesday: Wu et al, 'Deciphering a neuronal circuit that mediates appetite', *Nature*. 2012 Mar 14;483(7391):594-7.

Dário F. de Jesus, Danica Drpic and Ana Cristina Lima

Wednesday: Inagaki et al, 'Visualizing Neuromodulation In Vivo: TANGO-Mapping of Dopamine Signaling Reveals Appetite Control of Sugar Sensing', *Cell*. 2012 Feb 3, 148(3): 583–595.

João Neto and Inês Sá Pereira

Thursday: Haubensak et al, 'Genetic dissection of an amygdala microcircuit that gates conditioned fear', *Nature*. 2010 Nov 11;468(7321):270-6.

Joana Neves and Gonçalo Rodrigues

Friday: Clark et al, 'Defining the computational structure of the motion detector in *Drosophila*', *Neuron*. 2011 Jun 23;70(6):1165-77.

Ana Maria Fonseca and Diana Pinheiro

Monday	Tuesday	Wednesday	Thursday	Friday
10.00-12.00 RC Introduction to neuroscience	10.00-12.00 AOM Neuronal control of food intake	10.00-12.00 GR Student Nanocourse	9.30-10.45 SL Principles of optogenetics	10.00-12.00 MO Visually guided behavior in zebrafish
	12.00-13.00 GR (CNP Col.) A molecular geneticist's strategy for understanding the fly brain		10.45-12.00 MM Neural mechanisms of fear conditioning	
			12.00-13.00 AL (CNP Col.) Defining the Neuronal Circuitry of Fear	
		LUNCH		
13.30-15.30 II Synaptic and structural plasticity	14.30-16.00 AOM Hedonism vs. homeostasis in feeding regulation	13.30 -15.30 CR The molecular and neuronal basis for nutrient decisions	14.30-15.00 AL Q&A	13.30-15.30 EC Towards a physiological exploration of sensorimotor processing in behaving <i>Drosophila melanogaster</i>
16.00-18.00 RC&II Paper discussion	16.00-18.00 AOM Paper discussion	16.00-18.00 CR Paper discussion	15.00-16.00 MM Fear in a social context	16.00-18.00 MO&EC Paper discussion
			16.00-18.00 SL&MM Paper discussion	18.00 CNP Beer Hour
			20.00 Dinner	

AL - Andreas Luthi;
AOM - Albino Oliveira-Maia;
CR - Carlos Ribeiro;
EC - Eugenia Chiappe;
II - Inbal Israely;
GR - Gerald Rubin;
MM - Marta Moita;
MO - Michael Orger;
RC - Rui Costa;
SL - Susana Lima.