Animal experimentation in the Neurosciences

3.6.2005
Dept. of Basic Neurosciences, CMU, Geneva
Salle de séminaire 7001

Time	Speaker	Affiliation	Topic (specific titles to be defined)
	Imaging neural function		
9	**P. Salmon**	CMU	Design and Production of Human Immunodeficiency Virus-Derived Vectors
9:30	**R. Aronoff**	EPFL	Targeted Genetic Manipulation of Mouse Barrel Cortex with Lentiviral Vectors
10	Pause		
10:30	**I. Rodriguez**	Fac Science	Fluorophores to visualize sensory pathways
11			
11:30	**M. Li**	Edinbourgh	Midbrain dopaminergic neuron development from stem cells:
12			application of genetic labeling and selection strategy
12:30	Lunch with Speakers		
	Behavioral testing of neural function		
14:00	**H. Würbel**	Giessen	Environmental modulation of brain and behaviour: implications for laboratory animal reserach
15:00	**D. Wolfer**	ZH	What can the analysis of mouse behavior tell us about brain function?
16:00	Pause		
16:15	**M. Cador***	Bordeaux	Addiction in rodents
17:00			

Organizer: Christian Lüscher

*to be confirme Talks should not last more than 45 minutes to allow for discussion

P. Salmon, CMU, Genève
Lentiviral vectors (LV) can transduce a wide range of cells in vitro and in vivo, including neurons, and can be used for generating transgenic animals. LV-mediated gene transfer results in the ubiquitous, tissue-specific, and/or regulated expression of these transgenes, depending on the promoter contained in the vector. LV systems can also mediate the knockdown of endogenous genes by expression of interfering small hairpin RNAs. LVs thus represent a key tool for in vitro and in vivo experimental approaches. We will discuss practical issues regarding anesthesia and animals handling respecting its integrity.

R. Aranoff, EPFL, Lausanne
We are interested in synaptic determinants of sensory processing and utilize the mouse barrel cortex as a model system. In order to genetically modify the cortical cells without activating compensatory mechanisms during development, we have begun to use lentiviral vectors for targeted injections of a particular whisker barrel. Both function and anatomy of infected cells appear normal when only GFP is expressed from such vectors. Currently, we are attempting to either knockout or knockdown NMDA channels, via injections of, respectively, virus expressing the Cre recombinase into transgenic 'floxed NR1' (from J. Tsien) mice, or virus encoding shRNAs targeting the NR1 gene into C57BL76 mice.

Meng Li, Institute for Stem Cell Research, University of Edinburgh, Edinburgh, UK

In conjunction with alternate models of Parkinson's disease (PD), we have generated ES cells and mice in which an eGFP reporter is knocked in to the *Pitx3* gene that is expressed exclusively in mDA neurons. I will report the characterization of *Pitx3*-GFP mice and discuss our current work using this reporter system for studying mDA neuron development and for functional identification of molecules governing mDA neuron differentiation from pluripotent stem cells.

Hanno Würbel Division of Animal Welfare and Ethology, University of Giessen, Germany

Laboratory mice and rats are raised under highly artificial conditions. Standard housing conditions have been associated with altered brain development, behavioural disorders, and an anxiogenic behavioural profile. These effects can be prevented by environmental enrichment without disrupting the precision and reproducibility of results from animal experiments. However, since environment and genotype interact in non-additive ways, systematic environmental (and genetic) variation is needed to determine the external validity of experimental results.

David P. Wolfer M.D., Univ. Zurich, Inst. Anatomy

The advances in mouse molecular genetics and the biological similarity between mice and humans have made this rodent species an important model in neuroscience, creating a large need for tools to study brain function at the level of behavior. In my talk I will discuss the potential and limits of current approaches and outline possible alternatives.

Ivan Rodriguez, Dépt. de Zoologie, Université de Genève

Transgenic technology in the mouse allows us today to direct expression of mulitiple genetically-encoded fluorophores in specific cellular populations. We will discuss practical issues of such transgenesis and show how we apply this type of approach to understand information coding in the pheromone-sensing system of the mouse, and make use of very specific promoters expressed in limited but well defined neuronal populations to express the fluorophores, which are then transported both antero and retrogradely. The visualization, in a single animal, of multiple parallel lines each labeled with different fluorophores, permit the study of the processing of a given pheromonal stimulus.