Antoine Triller's research group is seeking to recruit 3 Post-Doctoral researchers in the frame of an ERC funded program

General thematic:

The tracking of single molecules has revolutionized our understanding of the regulation of neurotransmitter receptors at the cell surface, demonstrating the importance of diffusion-capture processes. Receptors in the plasma membrane continuously exchange between synaptic and extra-synaptic locations. Interactions between neurotransmitter receptors and postsynaptic scaffold proteins control the distribution of receptors at synaptic and extra-synaptic sites. This mechanism is modulated at many levels (e.g. receptor-scaffold or scaffold-scaffold interactions), and contributes to the regulation of the synaptic strength of excitatory and inhibitory synapses in physiological and pathological conditions. The gap in knowledge between the molecular instability of randomly diffusing receptors and the stable functional architecture of synapses will be addressed through super-resolutive and single particle tracking methods, and combining them with electrophysiology and functional imaging. Accessing molecular dynamics in an integrated system such as organotypic cultures and ultimately *in vivo* is a challenge but will represent a significant and revolutionary breakthrough in the field.

Research projects (RP1-3) will focus on inhibitory Glycine and $GABA_A$ receptors (GlyR, $GABA_AR$).

RP1. Controlling synaptic receptor number: toward chemistry *in cellulo*

***Objective*:** establish quantitatively the link between diffusion dynamics and receptor trapping at synapses in relation with the chemical properties of molecular interactions. This innovative approach involving the development of new imaging technologies, will uncover the mechanisms responsible for receptor accumulation at synapses.

RP2. Cell-autonomous regulation of inhibition: activity and Ca^{2+}-dependent diffusion trapping

***Objectives*: 1)** to establish how phosphorylation-dependent affinities within the postsynaptic assembly impact the diffusion dynamics and the number of receptors at synapses; and **2)** to link this regulation with the excitation/inhibition equilibrium.

RP3. Non-cell autonomous regulation of inhibition: glia and inflammation

***Objective*:** elucidate the role of glia-neuron interactions for the regulation of the molecular dynamics and synaptic accumulation of GlyRs and $GABA_ARs$ at inhibitory synapses.

Applications should include the following documents:

- A cover letter,
- A Curriculum Vitae

These documents and two letters of recommendation e-mailed directly by their authors should be sent to: daniele.murciano@ens.fr and christian.specht@ens.fr

DEADLINE FOR APPLICATIONS MAY 15th, 2013

Start date: End of 2013 at the latest

The net annual salary will be indexed on the postdoctoral researcher scale. The position will be funded for 24 months with the possibility of an extension.

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