



INSTITUT PARIS DESCARTES  
NEUROSCIENCES  
COGNITION



FÉDÉRATION DE RECHERCHE EN  
NEUROSCIENCES

## Neuroscience Seminar Series

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**Monday, May 9<sup>th</sup>, 2016 at 11:30**

Salle des Conférences (R229)

Centre Universitaire des Saints-Pères

45 rue des Saints-Pères, 75006 Paris

### **Maria Geffen**

*Assistant Professor of Otorhinolaryngology*

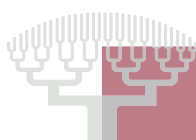
*University of Pennsylvania, Perelman School of Medicine*

## *Neuronal circuits for dynamic auditory processing and learning*

*Hearing perception relies on our ability to tell apart the spectral content of different sounds, and to learn to use this difference to distinguish behaviorally relevant (such as dangerous and safe) sounds. Recently, we demonstrated that the auditory cortex regulates frequency discrimination acuity following emotional learning. However, the neuronal circuits that underlie this modulation remain unknown. In the auditory cortex, excitatory neurons serve the dominant function in transmitting information about the sensory world within and across brain areas, whereas inhibitory interneurons carry a range of modulatory functions, shaping the way information is represented and processed. I will discuss the results of two of our recent studies that elucidate the function of specific inhibitory neuronal population in sound encoding and perception. In the first study, we find that interneurons in the auditory cortex, belonging to a specific class (parvalbumin-positive), modulate frequency selectivity of excitatory neurons, and regulate frequency discrimination acuity and specificity of discriminative auditory emotional learning. In a second study, we find that two different classes of cortical interneurons differentially amplify the ability of excitatory neurons to adapt their responses to frequent sounds. By selectively reducing responses to frequently, but not rarely, occurring sounds, auditory cortex enhances the brain's ability to detect unexpected events. These results expand our understanding of how specific cortical circuits contribute to auditory perception in everyday acoustic environments.*

Those interested in meeting with the speaker please contact

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*Les Sciences de l'Homme et de la Santé*