LEARNING AND MEMORY IN NEURONAL CIRCUITS OF FEAR

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In my lecture, I will introduce the basic concepts of classical fear conditioning and how behavioral learning is represented at the level of synapses, cells and circuits in the amygdala and related brain structures. Moreover, I will explain how fear extinction, a form of inhibitory learning that allows for adaptive control of conditioned fear responses, taps into the neuronal circuitry of conditioned fear and how it may control fear at the behavioral level.

I will present recent data from several labs addressing the question how amygdala microcircuits mediate the acquisition and extinction of conditioned fear responses. In particular, it emerges that the acquisition, consolidation and expression of fear and extinction memories are mediated by highly specific neuronal circuits embedded in a large-scale brain network including the amygdala, prefrontal cortex, hippocampus and brain stem. Moreover, I will describe how switches in the activity between distinct types of neurons located in the basal and central nuclei of the amygdala underlie context-dependent expression and extinction of fear memories. Finally, I will address the role of amygdala circuits beyond fear learning.

Literature:


Biographical sketch

Name: Lüthi, Andreas
Date of Birth: 17th November 1968
Place of Birth: Basel, Switzerland
Citizenship: Swiss

Education
1988-1992 M.Sc. in Biology University of Basel, Switzerland
1993-1996 Ph.D. in Neurobiology University of Basel, Switzerland

Employment
1996-1998 Postdoctoral Fellow Department of Anatomy, University of Bristol, UK
1998-2000 Postdoctoral Fellow Brain Research Institute, University of Zurich, Switzerland
2000-2003 Assistant Professor Department of Pharmacology/Neurobiology, Biozentrum, University of Basel, Switzerland
2003-2004 Junior Group Leader Friedrich Miescher Institute, Basel, Switzerland
2004- Group Leader Friedrich Miescher Institute, Basel; Titular Professor, University of Basel, Switzerland

Honors and Fellowships
Swiss National Science Foundation/ European Union, TMR Fellowship – 1996; EMBO Long-Term Fellowship – 1996; Roche Research Foundation, Postdoctoral Fellowship – 1996; Borderline Personality Disorder Research Foundation, Junior Investigator Award – 2003; Swiss National Science Foundation, Professorship – 2003; Titular Professor, University of Basel – 2006; Pfizer Research Prize, Neuroscience – 2006; NARSAD Independent Investigator Award – 2008; Betty and David Koetsier Award for Brain Research - 2009.

Professional Service
2005-2009 Council Member, Swiss Society for Neuroscience
2007 Founding Co-Chair, Gordon Conference, “Amygdala in Health and Disease”
2007- Advisory Board Member, Paris School of Neuroscience
2009 Member, Program Committee FENS 2010, Amsterdam

Publications (selected)


