EuroSciCon

4th EuroSciCon Conference on

Neurology & Neurological Disorders

July 12-13, 2018
Paris, France

Martine Hamann, J Neurol Neurosci 2018, Volume: 9
DOI: 10.21767/2171-6625-C1-008

TINNITUS, A NEUROLOGICAL DISORDER UNDERLINED BY AN ALTERATION OF SYNAPTIC PLASTICITY IN THE AUDITORY BRAINSTEM

Martine Hamann
University of Leicester, UK

Tinnitus, the phantom perception of sound, affects 10 to 15% of the adult population worldwide. Despite its prevalence, there are still no U S Food and Drug Administration (FDA)- or European Medicines Agency (EMA)-approved drugs on the market that target tinnitus. Over the past decade, numerous studies suggest that tinnitus results from an increased central gain in response to cochlear damage and hearing loss. Our previous studies shed light on dysfunctional excitability in the central auditory system during hearing loss. Here, we show that exposure to loud sound leading to hearing loss and tinnitus triggering a deficit in synaptic plasticity due to an increased release probability of glutamate in the central auditory brainstem. More importantly, we show that *in vivo* administration of magnesium threonate promotes recovery from these deficits, and allows recovery using an experimental model of tinnitus. The significance and novelty or our study is linked to the physiological relevance behind the modulation of long-term potentiation (LTP), the neural basis for learning and memory. We showed that LTP alterations form a memory trace in the dorsal cochlear nucleus that is related to the phantom perception of auditory objects. Decreasing release probability could potentially lead to the development of novel treatments for tinnitus and open new avenues for understanding cellular and network mechanisms linked to aberrant auditory perceptions. Although tinnitus is caused by cochlear dysfunction, it is actually a neurological disorder for which underlying cellular mechanisms remain poorly understood. Our study highlights a novel role for synaptic plasticity in an auditory brainstem nucleus and describes cellular mechanisms behind a therapeutic intervention against tinnitus.

Biography

Martine Hamann is an Associate Professor of Neurosciences in the Department of Neurosciences, Psychology and Behaviour at University of Leicester (UK). She has graduated and obtained her PhD in Neurosciences from University of Strasbourg. She was a Research and Teaching Assistant at Centre Médical Universitaire in Geneva and completed Post-doctoral studies from University College London. She became a RCUK Research Fellow at University of Leicester (UK), studying the effects of acoustic over-exposure on the dorsal cochlear nucleus, the auditory cerebellum. Her research focuses on understanding cellular mechanisms associated to hearing loss and tinnitus in pre-clinical models, and aims at identifying markers to prevent or target those auditory deficits. Her projects involve modulation of temporal encoding after acoustic over exposure, understanding genetic dysregulation after acoustic over-exposure and identifying molecular mechanisms common to epilepsy and tinnitus.

mh86@le.ac.uk