



First author Abolafia, Juan Manuel (poster)

Poster board D1 - Tue 15/07/2008, 16:45 - Hall 1
Session 188 - Auditory 2
Abstract n° 188.1
Publication ref.: *FENS Abstr.*, vol.4, 188.1, 2008

Authors Abolafia J. (1, 3), Perez-Marcos D. (1, 3) & Sanchez-Vives M. V. (1, 2, 3)

Addresses (1) IDIBAPS, Barcelona, Spain; (2) ICREA, Barcelona, Spain; (3) Inst. de Neurociencias de Alicante, Alicante, Spain

Title Auditory adaptation and post-adaptation in auditory cortex of the freely moving rat.

Text The influence of the previous history of stimulation on sensory responses is a constant in different sensory systems. In this work we explored how the firing frequency and the timing of neuronal responses are determined by preceding stimuli. We recorded from isolated units in the primary auditory cortex of chronically implanted freely moving rats. The stimulus consisted in two sounds (white noise) separated by a variable inter-stimulus interval (ISI; 50 ms-5 s). Our results revealed that when the ISI was shortened, and the duration or intensity of the first stimuli were increased, the firing frequency induced by a second stimulus was significantly decreased. Interestingly, sensory responses were influenced by stimuli occurring up to 2 seconds earlier. Similarly, the latency of the response to the 2nd stimulus was often significantly longer than that of the first. Thus, shorter ISIs induced more delayed responses to the 2nd stimulus (17 ms) than longer ISIs did (15 ms). The duration of the first stimulus also determined the lag of the response to the second stimuli (17 ms and 19 ms for 50 and 500 ms duration of the first stimuli, respectively). The intensity of the first stimulus though was found to be less critical to determine the latency of the second response (16 ms for any intensity). Stimulus post-adaptation was also observed, being more common for the second sound (47%) than for the first (39%), although the underlying mechanisms need yet to be elucidated. To conclude, we found that the history of stimulation not only alters the amplitude of subsequent responses, but also their timing. This increased lag of the second response correlates to the decrease in the response. Since navigation in the real world implies a permanent bombarding by different sounds, auditory perception should be determined by a continuous readjustment of amplitude and timing of the neural responses.

Supported by Ministerio de Educación y Ciencia de España (BFU2005-00041/BFI).

Theme D - Sensory and motor systems
Auditory - Auditory cortex