## PREMIO AL MEJOR PÓSTER

# Electrophysiological evidence for an early change detection reflected by modulations of the middle-latency evoked potentials

Recasens M [1,2], Grimm S [1,2], Slabu L [1,2], Costa-Faidella J [1,2], Escera C [1,2]
1 Institute for Brain, Cognition and Behavior (IR3C), University of Barcelona, Spain
2 Cognitive Neuroscience Research Group, Department of Psychiatry and Clinical Psychobiology, University of Barcelona, Spain
recasensmarc@gmail.com

The rapid detection of changes in the acoustic environment becomes a crucial function of the auditory system when detecting potentially relevant novel events. Until now, auditory change detection has been associated to the Mismatch Negativity (MMN), an event-related potential (ERP) occurring between 100 and 250 ms after the onset of a sound breaking an acoustic regularity previously encoded.
Animal studies using SSA (Stimulus-Specific Adaptation) as index for change detection either on the single-unit or multi-unit level have shown that rare sounds can be processed in earlier time ranges corresponding hierarchically to lower structures of the auditory system. These studies lead to the suggestion that detection of acoustic changes is a pervasive feature present all along the auditory pathway.
In the present study we tested this hypothesis in human subjects by measuring middle-latency auditory evoked potentials (MAEPs) and long-latency auditory evoked potentials (LAEPs) during a controlled frequency oddball paradigm. Frequency deviants spanned from 800Hz and 3730Hz in a long and a low-frequency range. Responses to deviant stimuli were compared against identical physical standard stimuli and control stimuli.
Latencies and amplitudes of the components P0, Na, Pa, Nb from MAEPs, and MMN from LAEPs were analyzed. Results showed a distinct response in the MAEPs range besides of a clear MMN. Specifically, the Nb component peaking at 40 ms showed an amplitude enhancement for deviants compared to standards and controls for both frequency ranges. The finding implies that early change detection processes exist in humans upstream of MMN generation which supports the emerging view of a hierarchical organization of change detection expanding along multiple levels of the auditory pathway.