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Contralateral White Noise-Induced Enhancement in the Guinea Pig's MLR: A Possible Link to Directional Hearing

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Abstract: The evoked potential components in a time window of 10-50 ms following an acoustic stimulus are called middle latency responses (MLRs). It is known that an amplitude enlargement occurs in guinea pig MLRs to monaural clicks when continuous white noise is applied to the other ear. This study was undertaken to see whether this enlargement is due simply to an overall, generalised effect of contralateral white noise (WN), or whether it may have some connection to directional hearing. Recordings were made from chronic guinea pig preparations with epidural electrodes in the temporal regions. Parallel to the results in the literature, an enlargement of the MLR to monaural clicks was seen when WN was at the opposite ear relative to the condition with no WN. A decrease was the result when WN was applied to the same ear as the click. With WN delivered to both ears an increase was observed again. We suggest that these findings, which are not likely to result from a generalised effect of WN over the auditory system, could be explained by a contribution to the MLR from binaural mechanisms which are probably stimulated by the momentary shift of the intra-cranial sound image from the side of the ear receiving the WN to side of the ear receiving the click.

Key Words: Guinea Pig, Middle Latency Response, MLR, Directional Hearing, Contralateral White Noise Enhancement

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