Reduction of Information Redundancy in the Ascending Auditory Pathway
Gal Chechik, Michael J. Anderson, Omer Bar-Yosef, Eric D. Young, Naftali Tishby, and Israel Nelken
[Summary] [Full Text] [PDF] [Supplemental Data]

The principles underlying information processing in sensory systems are still largely unknown, but insights can be obtained by measuring the transformations in stimulus representation in successive brain processing stations. Here, Chechik et al. compare information content and stimulus-induced information redundancy in a series of three auditory processing stations, and find that midbrain neurons (inferior colliculus) are highly informative but redundant due to their frequency selectivity. Information redundancy is absent in thalamic and cortical representations, where different neurons convey nearly independent informational attributes. Redundancy reduction of sensory information may be a general organizing principle of neural systems, allowing for a successively easier readout of complex stimuli. The context and significance of this study are discussed in a Preview by Schnupp.

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