聴覚情景分析と選択的聴取の脳内メカニズム

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日常の環境では，さまざまな音が同時に鳴っていることが多い．耳に到達する音響信号は，それらの混合信号である．健常な聴取者は，その混合信号を意味のあるまとまりに分解し，何がどこで起きているかを把握したり（聴覚情景分析），その中から特定の対象だけを聴き取ったり（選択的聴取）することができる．我々は，この柔軟な聴覚機能を実現している脳の情報処理メカニズムについて，心理物理学的手法による健常者および選択的聴取困難者の知覚特性の分析，脳波計や機能的 MRI を用いた脳活動計測，神経伝達物質関連遺伝子の多型性と知覚の個人差の解析，瞳孔径変化などの自律神経系反応計測，耳音響放射の計測など，多角的手法を用いて解明を進めている．その結果，皮質下および皮質上の，聴覚主経路以外も含む広範な脳部位のダイナミックな相互作用が本質的な役割を果たしていることが明らかになってきた．計算論的観点からは，入力信号の短期的・長期的な統計的性質に基づく予測符号化，反復共起に基づくスパース表現の獲得，内的に生成されたリズムへの引き込みなどの情報処理原理が浮かび上がってきた．

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