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Rats as Model Systems for Auditory Discrimination
Tasks

Majors: Physiology and Neurobiology, Psychology

Despite their relatively small frame, it is no secret that rats have made a sizable contribution to biomedical research and the advancement of human healthcare. These so-called “lab rats” have been used as physiological model systems of human disease for decades and have allowed for the elucidation of mechanisms of several disease states including obesity, cancer, and neurological deficits. One way rats are used in behavioral neuroscience is through auditory discrimination tasks to study how sound perception works in the brain. Through operant conditioning, rats are trained in the auditory discrimination tasks for the purpose of tracking auditory processing through various cortical structures, including the primary auditory cortex (AI), medial geniculate body (MGB) of the thalamus, and caudal suprarhinal auditory field (cSRAF) to name a few. Through this research, rats can be trained to distinguish sounds between duration and frequency and later, through electrocorticography (ECoG), their brainwaves can be recorded to gauge arousal and attention state of the animal and for further analysis of behavior. My project will encompass why rats are used for auditory cortical processing research, discuss previously used methodologies of auditory discrimination tasks, and examine clinical applications of this field of study.