9:00

3aABa5. Novel technique for rapid screening of tinnitus in rats. Jeremy G. Turner, Thomas J. Brozoski, Jennifer L. Parrish, Carol A. Bauer, Larry F. Hughes, and Donald M. Caspary (Southern Illinois Univ. School of Medicine, P.O. Box 19620, Springfield, IL 62794-9620, jturner@siumed.edu)

Measuring tinnitus in laboratory animals is difficult, involving weeks or months of operant training. Preliminary data suggest that rapid screening for tinnitus in rats can be accomplished using an unconditioned acoustic startle reflex. In control animals, a gap in an otherwise constant acoustic background inhibits a subsequent startle response to a sound impulse. If, however, the background signal is qualitatively similar to the animal's tinnitus, poorer detection of the gap and less inhibition of the startle might be expected. Fourteen animals with putative tinnitus at 10 kHz and 13 control animals were tested for gap detection using three different background signals: broadband noise, and filtered bandpass noise centered either at 16 kHz (15.5–16.5 kHz) or at their suspected tinnitus locus of 10 kHz (9.5–10.5 kHz). As predicted, animals with evidence of tinnitus exhibited significantly worse gap detection at 10 kHz, and were not significantly different than control animals at 16 kHz and broadband noise. These results suggest a new methodology for rapidly detecting tinnitus in individual animals. Equipment donated by Hamilton-Kinder Inc Behavioral Testing Systems in the memory of SIU graduate Dorothy Jean Kinder (Walker). [Work supported by NIH grants AG023910-01 (JT), DC4830 (TB & CB), and DC00151 (DC).]

9:15

3aABa6. Emotional learning modulates the rats sensitivity to transient changes in correlation between sounds. Juan Huang, Liang Li, Zhigang Yang, Junli Ping (Dept. of Psych., Natl. Key Lab. on Machine Percept. Speech and Hearing Res. Ctr., Peking Univ., Beijing 100871, China), Xian Liu, Yixin Chen, and Xihong Wu (Peking Univ., Beijing 100871, China)

Humans are sensitive to small discrepancies between two sounds, and can detect a transient change in sound correlation. Here, prepulse inhibition of the startle reflex was used to examine rats sensitivity to transient changes in correlation between two correlated broadband noises, which were delivered by two spatially separated loudspeakers. The results show that either an uncorrelated noise fragment (UCNF, a drop of inter-sound correlation from 1.00 to 0 and then return to 1.00) or an anti-phase noise fragment (APNF, a drop of inter-sound correlation from 1.00 to -1.00 and then return to 1.00) could be detected by rats, since each of the changes in correlation could act as a prepulse stimulus to inhibit the startle reflex. The duration threshold for detecting the APNF was much lower than that for the UCNF. The detection of each of the changes in correlation was improved either by prolonged testing or by temporally pairing the UCNF or APNF with footshock. Thus similar to humans, rats also have the sensitivity to a sudden change in inter-sound correlation. Moreover, an increase of the sensitivity can be induced in rats either by repeated exposure to the change in correlation or by emotional learning.

9:30

3aABa7. The role of tragus on echolocating bat, *Eptesicus fuscus*. Chen Chiu (Neurosci. and Cognit. Sci. Program, Univ. of Maryland, College Park, MD 20742) and Cynthia Moss (Univ. of Maryland, College Park, MD 20742)

Echolocating bats produce ultrasonic vocal signals and utilize the returning echoes to detect, localize and track prey, and also to avoid obstacles. The pinna and tragus, two major components of the bats external ears, play important roles in filtering returning echoes. The tragus is generally believed to play a role in vertical sound localization. The purpose of this study is to further examine how manipulation of the tragus affects a free-flying bat's prey capture and obstacle avoidance behavior. The first part of this study involved a prey capture experiment, and the bat was trained to catch the tethered mealworms in a large room. The second experiment involved obstacle avoidance, and the bat's task was to fly through the largest opening from a horizontal wire array without touching the wires. In both experiments, the bat performed the tasks under three different conditions: with intact tragus, tragus-deflection and recovery from tragus-deflection. Significantly lower performance was observed in both experiments when tragi were glued down. However, the bat adjusted quickly and returned to baseline performance a few days after the manipulation. The results suggest that tragus-deflection does have effects on both the prey capture and obstacle avoidance behavior. [Work supported by NSF.]

9:45

3aABa8. Minimum audible angles for aerial pure tones in a northern elephant seal (*Mirounga angustirostris*). Marla M. Holt, Ronald J. Schusterman (UC Santa Cruz Long Marine Lab., 100 Shaffer Rd, Santa Cruz, CA 95060), Brandon L. Southall (UCSC Long Marine Lab. and NOAA Fisheries Acoust. Program, Silver Spring, MD 20910), and David Kastak (UC Santa Cruz Long Marine Lab., Santa Cruz, CA 95060)

Recent work has shown that several pinniped species localize aerial broadband signals as accurately as some terrestrial carnivores. Additionally, both harbor seals and California sea lions can better localize both the lower and higher frequencies of their hearing range compared to performance at intermediate frequencies. These results are congruent with the duplex theory of sound localization which states that low frequencies are localized by interaural time differences while high frequencies are localized by interaural intensity differences. Northern elephant seals are land breeding pinnipeds whose range of best hearing sensitivity is shifted toward lower frequencies compared to other pinnipeds tested thus far. In this study, we tested a female northern elephant seal in a hemi-anechoic chamber at six frequencies ranging between 0.8 and 16 kHz that were presented at levels approximately 25 dB above threshold. A left/right behavioral procedure was used to measure minimum audible angles (MAAs) at 75 percent correct discrimination. MAAs ranged from approximately three to fifteen degrees. Best performance occurred at the lower frequencies while worse performance occurred at the two highest test frequencies. Unlike sea lions and harbor seals, this subject showed a decreased ability to utilize interaural intensity differences above 4 kHz.