Kaylah Jacques and Doris Serrano
BIOL 040: Audition Glossary Terms

Acoustic adaption hypothesis: The hypothesis that evolution favors those acoustic signals that suffer minimal propagation losses and noise overlap.
Acoustic impedance: A measure of how hard it is for sound to travel through a medium or structure; mismatch between tissue and air is the reason we have a middle ear.
Active space: The volume in which a receiver can still detect and identify a sender's signal.
Basilar membrane: A flexible membrane within the cochlea where hair cell bundles sit; stiffness gradient accounts for tonotopy and place.
Basilar papilla: The ancestor of tetrapod auditory epithelial structures which later evolves into the mammalian cochlear organ.
Bone conduction: The transmission of sound through the skull bones directly into the inner ear; an important feature of mysticete whales, seals, and some terrestrial mammals.
Cochlea: The auditory structure of the mammalian inner ear, filled with fluid and coiled.
Dispersion: Different frequencies propagate at different speeds.
Frequency response: A graph that displays the changes in the amplitude of a signal component caused by the box on the vertical axis and the frequency of that component on the horizontal axis.
Impedance matching: Utilizing the ear stone, ossicles, and the area ratio around the oval window to effectively couple sound energy from one medium to another with different impedances (air to fluid).
Inner ear: Sensory fluid-filled part of the ear (cochlea and vestibular system), where hair cells are responsible for frequency analysis and transduction.
Interaural level difference (ILD): Difference in sound intensity between the two ears, primarily utilized for higher frequency localization.
Interaural time difference (ITD): Difference in the time of arrival of a sound at the two ears, primarily utilized for lower frequency localization.
Near Field: The region that is very close to a sound source where the particle motion of the medium dominates over pressure variation, causing the medium to move back and forth.
Ossicles: Small bones in the middle ear of mammals, and a single bone called the columella in amphibians, reptiles, and birds, used as levers to amplify pressure on the oval window.
Oval window: Small membrane that the stapes bone pushes on to transmit sound to the cochlear fluid; this is the inner ear entrance.
Pinna: Flap of the outer ear of mammals, used to identify and amplify sound and its spectrum, especially to determine the elevation of a sound source.
Ranging:estimation of sender distances from acoustic degradation.
Rayleigh wave: A seismic wave that travels on the ground surface and is felt through bone conduction.
Reverberations: Reflected versions of the signal from the sender that arrives at the receiver.
Semicircular canals: Three canals in the inner ear that contain fluid and can feel rotation of the head, but have a similar cellular structure to the hearing apparatus.
Saccule/utricle/lagena: These are sacs in the inner ear containing hair cells and otoliths. In fish and amphibians, these are involved in balance and hearing.
Statocyst/otolith organ: Balanced organs using hair cells and a heavy mass. In vertebrates, these develop into parts of the inner ear.
Tympanum (Eardrum): Thin membrane vibrates in response to sound and transmits vibrations to the middle ear.
Waveguide: Sound trapped between surfaces and traveling along them, often with preferred modes and cutoff frequencies (used in ocean sound, but also in how sound reaches marine vertebrates).