

# Qualia

## The Omaha Tiger Project

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The Omaha Tiger Project began ten years ago under Dr. Edward Walsh, Director of the Development, Auditory and Physiology Laboratory at Boys Town National Research Hospital. Along with colleagues from the hospital, University of Toledo, MIT, Harvard University, Creighton Medical Center and the Omaha Henry Doorly Zoo, Walsh conducts research on hearing and vocalization in tigers – in Nebraska, far from their natural habitat.

A sound-proof bio-acoustics lab has been built at the zoo specifically for tiger research. The team also has access to CT, CAT, and MRI machines to image the animals' vocal tracks and inner and middle ears.

Tiger conservation is the main goal of this acoustic research project. Walsh and his collaborators hope their findings will not only add to our understanding of these beautiful animals, but also contribute to their preservation in the wild.

Previous research from the Omaha Tiger Project showed some tiger sounds have significant low frequency and infrasonic frequency (below the range of human hearing) components. Tigers may rely on these signals to attract mates and repel rivals from their territories over long distances, as lower frequencies can travel farther. By examining the auditory response of the brains of anesthetized tigers, the researchers confirmed tigers are especially sensitive to lower frequencies. Investigations of their inner ear structure verified they are able to hear and process infrasonic frequencies as well.

Walsh recently presented new research at the Symposium on Acoustic Communication by Animals in Ithaca, New York, suggesting the inner ear of the tiger may have adapted during the course of its evolution to be different than that of most other mammals. In tigers, neural responses to lower frequency sounds were just as fast as responses to higher frequency sounds,

while in most mammals neural response latency and stimulus frequency are inversely related. The behavioral implications of this finding are not known, but it may confer a hunting or communicative advantage.

The Omaha Tiger Project is yielding research findings that have real-world conservation applications. The idea of using infra-sound to deter tigers from villages and livestock is being discussed. A long-term aim of the project is to determine whether the sounds of individual tigers are distinctive enough to serve as "acoustic fingerprints" that could allow discrimination of individuals based on their vocalizations. If so, tiger population censuses could be obtained using arrays of microphones in their territories.