

# Owls on Campus

**UO LAB STUDIES  
BIRDS OF PREY  
AND HOW  
THEY HEAR**

By Amy Klarup



ILLUSTRATION BY SARAH DECKER

**T**he University of Oregon hosts a number of traditional campus critters — crows, squirrels and freshmen, to name a few.

But hidden away in neuroscientist Terry Takahashi's lab is a parliament of 10 barn owls that helps Takahashi and his team of researchers understand the complexity of hearing in both birds and mammals. The owls have even led the scientist's team to discoveries that could improve the lives of human beings.

"They're really good at figuring out where sounds are coming from," says Takahashi, a professor in the UO's biology department and co-director of the UO's Institute of Neuroscience. "They're good enough that you can put them in a completely dark environment — like a moonless night, for example — and they can use their sense of hearing to capture prey."

Barn owls don't use echolocation like bats or porpoises. Instead, Takahashi explains, owls use time to locate where a noise is coming from. Imagine a sound wave traveling toward an owl's head, Takahashi says, with the sound first hitting the owl's left ear and then traveling over the owl's

head to hit its right ear. Owls' brains can use that time difference to calculate where a noise is coming from.

"Their brains have been engineered through evolution to be incredibly sensitive to these time differences," Takahashi says.

People can do this, too, but owls are just as good at it, even though they have less surface area to work with.

Barn owls also have asymmetrical heads, with the right ear pointing upward and the left ear pointing down. Takahashi says this configuration helps the owl determine where a sound is coming from — if the noise is louder in its right ear, it knows the sound is coming from above.

The barn owls at the UO, which live on campus and have been captive bred there since at least 1989, participate in behavioral experiments wearing owl-sized ear buds that play a variety of recorded sounds. Researchers observe how the owls respond to the noise and measure the accuracy of their head turn as they react. They also monitor brain activity with electrodes.

Ultimately, Takahashi's team seeks to better understand what's happening in an owl's brain when it locates noise

sources. In the meantime, Takahashi's lab has discovered a new method for testing hearing in babies — human babies, that is.

Takahashi explains the phenomenon: "If you play a sound to an owl or a person, and it's a sudden sound, the pupil dilates momentarily. It's a really rapid reflex."

Avinash Bala, a research associate in Takahashi's lab, noticed this reflex and subsequently realized that audiologists could use this information to test for deafness in young children who can't yet verbally confirm when they hear or don't hear a noise. Though still in development, the idea could lead to a smoother, easier hearing test.

"I think that's why you do basic research," Takahashi says. "That's why you study fish that live in muddy puddles in India, or owls or bats. You never know where the next application is going to come from."

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