to the pigmented Strep B had problems. Four went into preterm labor; the fifth had an emergency C-section after researchers found discolored amniotic fluid indicating an infection.

Neutrophils flooded the sites of infection, but to no avail. Strep B's pigment, a chain of fat attracted to cell membranes, poked holes in the neutrophils. The pigment "inserts in random places, disfiguring the membrane," Rajagopal says. Neutrophils normally expel their innards, ensnaring invaders in a mess of DNA and chromatin, but the traps were ineffective against the pigmented bacteria.

Maria Gloria Dominguez-Bello of the New York University School of Medicine says that this "beautiful, elegant study" raises a lot of questions, such as how Strep B can go from harmless to dangerous.

Other recent work found that some Strep B strains emit toxic sacs that are associated with stillbirth in mice (*SN: 10/1/16, p. 11*). But the pigment seems to be the bacteria's primary weapon, the authors of the new paper argue. ■

Krupenye's team shows for the first time that a nonhuman animal can track others' false beliefs, says psychologist Amanda Seed of the University of St. Andrews in Fife, Scotland. But it has yet to be demonstrated that apes, like humans, can act on such knowledge, say, by hiding food from others, she says.

Laurie Santos, a psychologist at Yale University, isn't so sure apes track false beliefs. Previous research has consistently indicated that no nonhuman animals monitor others' beliefs, even on tasks similar to those used by Krupenye's team, Santos says. In the new study, she adds, apes may have realized that an observer was ignorant about an object's new location but not that he had false expectations about where to find it.

Krupenye disagrees: "The apes specifically anticipated that the actor in the video would search for an object where we humans know the actor falsely believed the object to be." ■

Jumping spider hears distant sounds

Arachnid can detect airborne noise from across a room

BY SUSAN MILIUS

Accidental chair squeaks in a lab have tipped off researchers to a new world of eavesdroppers.

Spiders don't have eardrums, though their exquisitely sensitive leg hairs pick up vibrations humming through solids like web silk. Biologists thought airborne sounds more than a few centimeters away would be inaudible. But the first recordings of auditory nerve cells firing inside a spider brain suggest that the *Phidippus audax* jumping spider picks up airborne sounds from at least three meters away, says Ronald Hoy of Cornell University.

During early sessions of spider brain recordings, Hoy's colleagues saw bursts of nerve cell, or neuron, activity when a chair moved. Systematic experiments then showed that from several meters away, the spiders detected relatively quiet tones at levels comparable to human conversation. In a hearing test based on behavior, the spiders also clearly noticed when researchers broadcast a low droning like the wing sound of a predatory wasp. In an instant, the spiders hunkered down motionless, the researchers report online October 13 in *Current Biology*.

Jumping spiders have brains about the size of a poppy seed. Hoy credits the success of probing even tinier spots inside these (anesthetized) brains to coauthor Gil Menda, also of Cornell. When Menda realized the spider brain reacted to a chair squeak, he and Paul Shamble, a coauthor now at Harvard, started clapping hands, backing away from the spider and clapping again. The claps didn't seem earthshaking, but the spider's brain registered clapping even when the researchers had backed out into the hallway.

G. MENDA/HOY LAB AT CORNELL

Jumping spiders (*Phidippus audax*, shown) can hear airborne sounds from several meters away, new experiments suggest.

Clapping or other test sounds might confound the experiment by sending vibrations through equipment holding the spider. So the researchers did their neuron observations on a table protected from vibrations. They also took the setup to an echo-dampened chamber in the lab of coauthor Ronald Miles at Binghamton University in New York.

Tests revealed a narrow, low-pitched range of special sensitivity for the spiders. They pick up rumbly tones pitched around 70 to 200 hertz, Hoy says; people hear best between 500 and 1,000 hertz.

Spiders may hear low rumbles much as they do web vibes: with specialized leg hairs, Hoy and colleagues propose. They found that making a hair twitch could cause a sound-responsive neuron to fire.

"There seems to be no physical reason why a hair could not listen," says Jérôme Casas of the University of Tours in France. When monitoring nerve response from hairs on cricket legs, he's tracked airplanes flying overhead. Hoy's team calculates that an 80 hertz tone the spiders responded to would cause air velocities of only 0.13 millimeters a second if broadcast at 65 decibels three meters away. That's hardly a sigh of a breeze. Yet it's above the threshold for leg hair response, says Friedrich Barth of the University of Vienna, who studies spider senses.

Eons of attacks from wasps might have been an evolutionary pressure favoring such sensitivity, Hoy says. If detecting wasp wing drone turns out to have been important in the evolution of hearing, other spiders vulnerable to wasps might do long-distance eavesdropping, too, says Ximena Nelson of the University of Canterbury in Christchurch, New Zealand. ■

Watch a spider respond to threatening sounds at **bit.ly/SN_jumpingspider**