of country codes, area codes, and regional codes, etc.," he proposes in PNAS.

Dreyer acknowledges that his picture of olfactory receptors offering embryonic targets rests on the contention that, in addition to recognizing odors, these proteins can bind to copies of themselves and to similar receptors. "These things are built to recognize molecules," he says. "It's perfectly reasonable, [but] there's no evidence. It's pure hypothesis."

Dreyer has outlined several experiments to test his theory. For example, he encourages researchers to mark when and where in an embryo the individual olfactory receptor genes are active. Those experiments would have to be analyzed carefully, he notes, because an embryo may show only a speckled pattern of cells expressing a particular receptor, much as only a small number of people in a specific area code would have the same last four digits in their phone number.

Mombaerts suggests another test: Scientists could create mice in which a large number of olfactory receptor genes have been disabled.

While a few biologists have already dismissed Dreyer's hypothesis as far-fetched, others are keeping an open mind. "The notion that olfactory receptor genes may be expressed in other cell types than olfactory sensory neurons deserves our full attention. I am afraid that this issue has never been seriously addressed," says Mombaerts.

Sensory cells (labeled in green) in the nose (left) extend their axons to targets in the initial odor-processing region of the brain (right).

Ngai and Joseph Dynes

John Ngai, who studies development of the vertebrate olfactory system at the University of California, Berkeley, admits he was ready to reject Dreyer's theory but found he couldn't.

"One experiment could tell us that the theory is totally impossible or implausible, but I haven't found that experiment yet. I don't know of any one thing that unequivocally says it's wrong," he says.

As for Dreyer, he has faced skepticism before and had the last laugh. In 1965, he and a colleague put forth the radical notion that immune cells shuffle DNA sequences to create the genes encoding the many antibodies and cell surface proteins that recognize infectious organisms. The idea was ridiculed initially but later proven correct. Dreyer is now hoping that history will repeat itself. □

Biology

Oh, not those jet-ski things again!

If motorboats were bad for nesting birds, jet skis promise to be worse.

Personal watercraft, both the stand-up and sit-down styles, disrupt breeding colonies even more than boats chugging by, says Joanna Burger of Rutgers University in Piscataway, N.J. She watched common terns nesting on an island in Barnegat Bay, N.J. As watercraft roared past, she kept track of how many birds became alarmed and soared into the air. Other studies have linked frequent alarms to declines in breeding.

The New Jersey channel was posted for "no wake," but Burger recorded plenty of fast, noisy traffic. She found that the birds reacted most dramatically early in the breeding season.

In these periods, a personal watercraft zipping by would send some 200 birds flapping into the air, more than six times as many as a motorboat passing. In the August CONDOR, Burger recommends that personal watercraft not be allowed within 100 meters of nesting colonies. —*S.M.*

New hunting trick explains bird luck

A hunting method that ornithologists had never recognized may explain why the red knot is such a lucky bird.

A kind of sandpiper, the knot stalks wet shores, hunting for buried mollusks and hard-shelled crustaceans. Finding bivalves can be tough, since they just clam up and give no clues to their location.

Yet red knots detected these buried treasures seven to eight times more often than predicted by models of random searching, according to a team led by Theunis Piersma from the University of Groningen in the Netherlands. The knots also beat the odds for hunting by touch, which is how some other shorebirds including oystercatchers find their prey.

The secret is right on the tip of the bill, the team reports. Microscopic examination revealed pits containing stacks of cells called Herbst corpuscles, similar to the organs used by other shorebirds to detect vibrations from wriggling prey.

The researchers propose that the red knots, however, use the system in a different way. As the knots drive their bills into the sand, causing water movement, the Herbst corpuscles sense pressure variations that occur when an immobile object, like a hidden bivalve, obstructs the flow.

In tests in captivity, birds were trained to indicate whether sand pails hold hidden mollusks. They could manage their task only when the sand was wet. Sounds of life did not seem relevant since the birds responded to rocks as well as to living prey.

The observation that the birds prefer to feed in sand so wet that there are puddles "suddenly makes sense," the researchers say in the August 7 PROCEEDINGS OF THE ROYAL SOCIETY OF LONDON B. —*S.M.*

Aspirin works on plants, too

Pain in the lower bark? Ralph A. Backhaus tells a plant to take two aspirin and call him in the morning.

Backhaus of Arizona State University in Tempe and his colleagues have unraveled a key mystery in the way aspirin shuts down a plant's response to injury. Although plants may not feel pain as people do, they do respond to injuries by pumping out a chemical called jasmonic acid. They even produce vapors, chemicals related to the jasmine in commercial perfumes, that waft from the injured plant and cause responses in neighbors.

For years, researchers have known that aspirin somehow shuts down plants' jasmonic acid output, which requires the enzyme allene oxide synthase. The synthase has "virtually nothing in common" with the enzyme that aspirin disables in humans, yet the researchers found that the painkiller knocks out both substances with the same kind of chemical reaction. Details appeared in the July 17 JOURNAL OF BIOLOGICAL CHEMISTRY. —*S.M.*