

Science and the Super-Fatty Eskimo Diet

EARTH SCIENCE | SPACE | TECHNOLOGY | EVOLUTION | PHYSICS | ASTRONOMY | ECOLOGY | ENVIRONMENT | GENETICS

VOL. 25, NO. 10

Discover

Mind Control

Are we entering
the brain-chip era?

By John Horgan

\$4.99 | CAN. \$6.50



OCTOBER 2004

Is life on Mars
from Pasadena?

Too old too soon:
Genes run amok

Desalinating
the oceans



HONEYBEES' ESPIONAGE MISSION

For more than half a century, biologists have been driven a little crazy trying to figure out why honeybees, unlike other bee species, perform an elaborate dance to tell their cohorts where the best flowers are. Biologist James Nieh at the University of California at San Diego thinks he may have finally figured out the puzzling behavior.

Nieh and his colleagues studied two species of tropical bees—the aggressive *Trigona spinepes* and the more mild-mannered *Melipona rufiventris*. Both bees use odors to mark a good source of pollen, but sometimes the strategy backfires. Nieh found that the *Trigona* bees can use the odor markings of the *Melipona* to find their food source and take it over. If the *Melipona* put up a fight, the *Trigona* gang up on them and rip them apart or simply decapitate them.

Nieh speculates that ancestors of today's honeybees might have adapted by leaving less obvious trails. That would help keep competitors away, he notes, but "you're providing less information to help your guys at the nest." Thus the honeybee dance is a great adaptation: It tells hive mates precisely where to find some choice, pollen-rich plants while keeping the information secret from other bees. —Sarah Webb



A hostile takeover in action: An aggressive *Trigona* bee sneaks up on an unsuspecting honeybee to commandeer its flower.

The All-You-Can-Eat Gene

Biologists investigating pathways associated with obesity have created a genetically modified mouse that can binge on fatty food without gaining weight. The critter's secret weapon is an overactive version of the gene for a protein—Wnt10b—that regulates the formation of flab. "Wnt10b is a switch that determines whether a pre-fat cell turns into a fat cell," says Ormond MacDougald, a physiologist at the Uni-

versity of Michigan Medical School, who led the study. "If the switch is turned on, it prevents the development of new fat tissue."

The modified mice had half as much body fat as normal, even when fed a high-fat diet. In addition, the mutants are less prone to type 2 diabetes because they are more insulin sensitive and more tolerant to glucose. But the trade-offs are scary: MacDougald's low-fat mice have freakishly thick skin, abridged mammary development, and are hypersensitive to cold. Not surprisingly, MacDougald expects that a gene-targeted treatment for our tubbiness is a long way off.

Nevertheless, the genetic basis for human obesity is becoming increasingly clear. A recent study in Ireland, for example, has uncovered evidence that famine survivors preferentially pass on a gene that helps the body store fat. Back when food was scarce, fat storage was a good way to stay alive. In modern times, those same genes are a prescription for plumpness. —Alex Stone



Fat deposits surround the kidneys of a normal mouse (left). Mice engineered to overproduce the protein Wnt10b have drastically smaller fat deposits (right) and are leaner; unfortunately, they lack the body fat needed to keep warm.

> DERIVATIONS

Clone

Drawn originally from the field of horticulture, the word was first used to denote a branch that had been cut off and rerooted to form a new, self-sufficient plant. It comes from the Greek *klŷn*, or "twig," and until the 20th century it was spelled without an *e*. In biology, the word came to mean any living thing cre-

ated by asexual reproduction. Geneticist J. B. S. Haldane is credited with coining the modern usage—an exact genetic copy of an organism—in 1963, in a speech titled "Biological Possibilities for the Human Species of the Next Ten Thousand Years." The word has also been co-opted to denote any copied object.