Mind Control
Are we entering the brain-chip era?
By John Horgan
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 fat. "Wnt10b is a switch that determines whether a pre-fat cell turns into a fat cell," says Osmond MacDougald, a physiologist at the University 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 tuberness 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

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 deicapitate 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.

> DERIVATIONS

**Clone**

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