

CLEARLY YOUR LOVE FOR THE GROCERY STORE'S COOKIE AISLE IS EXTREME. SCIENTISTS, HOWEVER, NEVER REALLY THOUGHT THAT A PERSON COULD BECOME HOOKED ON SWEETS LIKE THEY WERE A DRUG. NOW A BATCH OF FINDINGS IS MAKING RESEARCHERS REEXAMINE THE CONCEPT. THE STUDIES, MOSTLY IN ANIMALS, PROVIDE EVIDENCE THAT OVEREATING SWEETS MAY SHARE SOME CHARACTERISTICS OF SERIOUS ADDICTIONS. FURTHER INSIGHTS MAY LEAD TO NEW TYPES OF EATING DISORDER TREATMENTS.

SUGAR ADDICTION

You tried it for Lent, as a New Year's resolution and to shed some pounds before bikini season hit. Yet each time your ban on sweets was derailed by a desire for Ben and Jerry's. Friends who regularly observe your weakness for desserts claim that you're a sugar addict.

Sugar addiction has long been joked about. Most researchers, however, believed you could not get hooked on sweets and lose control over consuming them, as if they were drugs. Now studies compiled over the years are making some scientists revisit the idea. The results do not indicate that donuts are in the same category as addictive drugs like heroin, alcohol or nicotine. They do suggest that some brain actions and characteristics associated with the intake of sweets and drug addiction may overlap.

The findings are leading to:

- A better understanding of how the brain controls food intake and how this system may go awry.
- New ideas on how to treat people with extreme compulsions to overeat sweets.

Studies that focused on brain chemicals, known as opioids, provided some of the first clues that an overlap may exist

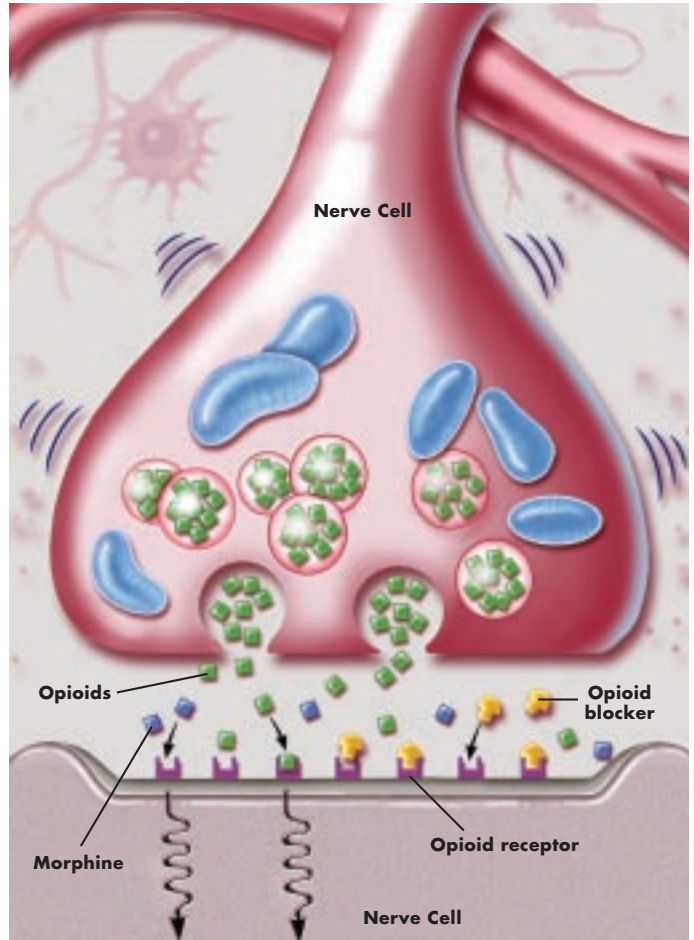


ILLUSTRATION BY UYDIA KIBUK

▲ RESEARCH INDICATES THAT COMPOUNDS THAT BLOCK OPIOID RECEPTORS, SPECIFIC NERVE CELL AREAS WHERE THE OPIOID CHEMICALS CARRY OUT THEIR ACTIONS IN THE BRAIN, CAN REDUCE THE INTAKE OF SWEET FOODS. ALTHOUGH DIRECT PROOF IS STILL LACKING, SOME SCIENTISTS BELIEVE THAT THIS FINDING INDICATES THAT SWEETS CREATE A RELEASE OF OPIOIDS THAT ACTIVATE THE RECEPTORS AND CREATE A PLEASURABLE RESPONSE. WHEN THE REACTION IS BLOCKED, SO IS THE URGE TO CONSUME SWEETS. IN ADDITION, IT'S KNOWN THAT SOME ADDICTIVE DRUGS, LIKE MORPHINE, DIRECTLY TARGET THE OPIOID RECEPTORS AND CREATE AN INTENSE RESPONSE. THIS SUGGESTS THAT THERE ARE PARALLELS BETWEEN DRUGS AND SWEETS. DRUGS, HOWEVER, LIKELY CAUSE MUCH MORE POWERFUL ACTIONS IN THE BRAIN.

between sweets and drugs. Some addictive drugs like heroin or morphine activate the opioid system to produce a pleasurable response that many

believe helps fuel a longing for more drugs and is key to the addiction process. In one study, compounds that blocked the activity of opioids made

HUDA AKIL, PhD

President
University of Michigan, Ann Arbor

STORY C. LANDIS, PhD

President-Elect
NINDS NIH

FRED H. GAGE, PhD

Past President
The Salk Institute

FOR MORE INFORMATION

please call Leah Ariniello,
science writer, or Joseph Carey,
senior director, communications
& public affairs, at (202) 462-6688

PAST ISSUES

<http://www.sfn.org/briefings>

COPYRIGHT © 2003 SOCIETY FOR NEUROSCIENCE

animals less interested in eating meals, particularly sweetened versions. Researchers found similar results in tests of humans with eating disorders like bulimia, marked by a habit of bingeing on foods that are typically sweet. The blockers cut in half the consumption of sweets packed with sugar and fat including candy bars and cookies. The intake of low sugar, low fat snacks such as popcorn, saltines, breadsticks and pretzels did not decrease. Some believe that the studies hint that sweets, like some drugs, have a pronounced affect on the brain's opioid system (see image), although direct proof is still lacking.

Whether through opioids or some other brain chemical, the scientists suspect that sweets like drugs can activate an "incentive system" in the brain that helps reinforce behaviors.

Activation by food is generally beneficial. It makes us want more and keeps us alive. Sweets, however, packed with calories, may create extra activity that helped us in primitive times when food was scarce, but is not needed today. Some also believe that gorging on sweets may alter the system so that it caters to addiction rather than survival, propelling some people to repeatedly binge.

Recent behavioral tests in rats further back the idea of an overlap between sweets and drugs. Drug addiction often includes three steps. A person will increase his intake of the drug, experience withdrawal symptoms when access to the drug is cut off and then face an urge to relapse back into drug use. Rats on sugar have similar experiences. Researchers withheld food for 12 hours and

then gave rats food plus sugar water. This created a cycle of bingeing where the animals increased their daily sugar intake until it doubled. When researchers either stopped the diet or administered an opioid blocker the rats showed signs common to drug withdrawal, such as teeth-chattering and the shakes. Early findings also indicate signs of relapse. Rats weaned off sugar repeatedly pressed a lever that previously dispensed the sweet solution.

Plans are under way to study binge eaters and further determine whether molecular and behavioral signs common to drug addiction exist. If confirmed, the research could lead to new ideas for treating eating disorders. It also may give you more incentive to steer clear of that pint of chocolate fudge brownie. Well maybe.



**NON-PROFIT
US POSTAGE PAID
WASHINGTON DC
PERMIT 4929**