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The Body-Brain Axis: Looking to the Brain to Change Nutrition and Behavior

Diet sodas were supposed to save us from our own appetites: all the sweetness, none of the calories. Yet a billion people are obese today, and obesity-related conditions such as heart disease, stroke, type 2 diabetes and certain types of cancer are on the rise. Our never-ending desire for foods rich in sugar and fat is likely to continue even in the face of a new generation of weight-loss drugs. Change will ultimately require an understanding of the brain circuits responding to these strong, highly appetitive stimuli.

Part of our eating problem—says Charles Zuker, a neuroscientist who has spent more than a decade revealing and exploring the biology of taste—is that taste is not just about the tongue. He has been looking to the gut, as well.

[Dr. Zuker's lab](#) identified brain regions that respond to different tastes, such as sugar and bitter, and different brain regions that detect the presence of sugar and fat in the gut. Together, these two parallel communication lines, the tongue and the gut-brain axis, drive our cravings. Dr. Zuker and colleagues showed that manipulating the activity of these neural circuits caused mice to no longer crave treats, even though the animals could still taste them. The researchers' studies also [revealed](#) why diet sodas are unsatisfying and fail to curb the desire for sweet; the drinks tickle the tongue but not the gut-brain axis.

Could novel approaches to taste centered on the brain and gut quench the insatiable desire for sugar and fat so many of us struggle with?

“As we conduct our science, we are searching for new therapeutic approaches that can reduce or eliminate that drive,” said Dr. Zuker.

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