

Endocannabinoids, body's natural marijuana-like chemicals, make fatty foods difficult to resist

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Recent studies have revealed potato chips and french fries to be the worst contributors to weight gain – and with good reason. Have you ever wondered why you can't eat just one chip or a single fry? It's not just the carbohydrates at fault.

UC Irvine researchers Daniele Piomelli, Nicholas DiPatrizio and colleagues found that fats in these foods make them nearly irresistible and trigger a surprising biological mechanism that likely drives our gluttonous behavior. The apparent culprit? Natural marijuana-like chemicals in the body called endocannabinoids.

In their study, the Piomelli team discovered that when rats tasted something fatty, cells in their upper gut started producing endocannabinoids. Sugars and proteins, the researchers noted, did not have this effect.

The process starts on the tongue, where fats in food generate a signal that travels first to the brain and then through a nerve bundle called the vagus to the intestines. There, the signal stimulates the production of endocannabinoids, which initiates a surge in cell signaling that prompts the wanton intake of [fatty foods](#), Piomelli said, probably by initiating the release of digestive chemicals linked to hunger and satiety that compel us to eat more.

"This is the first demonstration that endocannabinoid signaling in the gut plays an important role in regulating fat intake," added the Louise Turner Arnold Chair in the Neurosciences and professor of pharmacology.

Study results appear this week in the online edition of *Proceedings of the National Academy of Sciences*.

Piomelli said that from an evolutionary standpoint, there's a compelling need for animals to consume fats, which are scarce in nature but crucial for proper cell functioning. In contemporary human society, however, fats are readily available, and the innate drive to eat fatty foods leads to obesity, diabetes and cancer.

The findings suggest it might be possible to curb this tendency by obstructing endocannabinoid activity – for example, by using drugs that "clog" cannabinoid receptors. Since these drugs wouldn't need to enter the brain, they shouldn't cause the central side effects – anxiety and depression – seen when endocannabinoid signaling is blocked in the brain, Piomelli noted.

Director of the UCI School of Medicine's Center for Drug Discovery & Development, Piomelli is one of the world's leading researchers on endocannabinoids. His groundbreaking work is showing that this system can be targeted by new treatments for anxiety, depression and obesity.

More information: "An endocannabinoid signal in the gut controls dietary fat intake," by Nicholas DiPatrizio, Giuseppe Astarita, Gary Schwartz, Xiaosong Li, and Daniele Piomelli, *PNAS*.

Provided by University of California - Irvine

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