

'Hunger hormone' enhances memory

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A team of neuroscience researchers at the University of Southern California have identified a surprising new role for the "hunger hormone" ghrelin. Ghrelin has previously been recognized for its unique role in sending hunger signals from the gut to the brain, but, as presented this week at the annual meeting of the Society for the Study of Ingestive Behavior, these new findings suggest that it may also be important for memory control.

Ghrelin is produced in the stomach and secreted in anticipation of eating, and is known for its role to increase hunger. "For example, ghrelin levels would be high if you were at a restaurant, looking forward to a delicious dinner that was going to be served shortly," said Dr. Elizabeth Davis, lead author on the study. Once it is secreted, ghrelin binds to specialized receptors on the vagus [nerve](#)—a nerve that communicates a variety of signals from the gut to the brain. "We recently discovered that in addition to influencing the amount of food consumed during a meal, the vagus nerve also influences [memory function](#)," said Dr. Scott Kanoski, senior author of the study. The team hypothesized that ghrelin is a key molecule that helps the vagus nerve promote memory.

Using an approach called RNA interference to reduce the amount of ghrelin receptor, the researchers blocked ghrelin signaling in the vagus nerve of laboratory rats. When given a series of memory tasks, animals with reduced vagal ghrelin signaling were impaired in a test of episodic memory, a type of memory that involves remembering what, when, and where something occurred, such as recalling your first day of school. For

the rats, this required remembering a specific object in a specific location.

The team also investigated whether vagal ghrelin signaling influences feeding behavior. They found that when the vagus nerve could not receive the ghrelin signal, the animals ate more frequently, yet consumed smaller amounts at each meal. Dr. Davis thinks these results may be related to the episodic memory problems. "Deciding to eat or not to eat is influenced by the memory of the previous meal," says Davis. "Ghrelin signaling to the [vagus nerve](#) may be a shared molecular link between remembering a past meal and the hunger signals that are generated in anticipation of the next meal."

These novel findings add to our understanding of how episodic memories are generated, as well as the relationship between memory and eating behavior. In the future, researchers may be able to develop strategies for improving [memory](#) capacity in humans by manipulating [ghrelin](#) signaling from the gut to the brain.

More information: Vagal afferent ghrelin signaling promotes episodic memory and influences meal patterns in rats, Presented July 2019, Society for the Study of Ingestive Behavior, Utrecht, Netherlands

Provided by Society for the Study of Ingestive Behavior

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