



Scientists Identify Vagus Nerve Role in Food-Related Memory

Description

Food is crucial in various life events, from weddings to family dinners. A recent study indicates that food might do more than enhance these occasions; it could play a direct role in forming memories.

Scott Kanoski, a biologist at the University of Southern California, led this research, published in *Nature Communications*. The study shows that after a nutritious meal, signals travel through the vagus nerve from the gut to the brain. This signal impacts neurons in a brain area called the medial septum, which is known to affect the hippocampus, the centre for memory.

Previous research confirmed that memories form in the hippocampus when neurons release acetylcholine, a neurotransmitter. The new findings suggest that gut activity can influence the release of acetylcholine in the medial septum, linking diet directly to memory formation.

The researchers used fiber photometry to measure brain cell activity in rats fed different diets. Those consuming fats and sugars showed enhanced memory-related activity, indicating that it is calorie intake, rather than the act of eating itself, which influences memory signalling.

However, a high-fat, high-sugar diet had the opposite effect. Rats given unhealthy 'junk food' early in life displayed weakened memory signals, struggling with memory tasks even after returning to healthier diets.

While the study's outcomes apply to rats, they might suggest similarities for humans, but more research is needed. Kanoski noted that disruptions in acetylcholine signalling are linked to Alzheimer's disease. These findings could lead to new treatments based on vagus nerve activity, with ongoing trials investigating their effects on human memory.

Vocabulary List:

1. **vagus** //ˈveɪɡəs// (noun): a nerve that connects the gut to the brain
2. **neurons** //ˈnɜːrɒnz// (noun): cells in the brain that send signals
3. **hippocampus** //ˌhɪpəˈkæmpəs// (noun): part of the brain that makes and stores memories
4. **acetylcholine** //ˌæsɪtəˈkoʊliːn// (noun): a chemical in the brain that helps memory
5. **intake** //ˈɪnteɪk// (noun): the amount of food or drink taken in
6. **disruptions** //dɪsˈrʌpʃənz// (noun): breaks or problems in normal brain or body work

Comprehension Questions



Multiple Choice

1. Who led the research on food and memory?

- Option: John Smith
- Option: Scott Kanoski
- Option: Alice Johnson
- Option: Michael Brown

2. In which journal was the study published?

- Option: Science
- Option: Nature
- Option: Nature Communications
- Option: Journal of Biology

3. What is the main role of the medial septum in relation to memory?

- Option: Regulating emotions
- Option: Processing visual information
- Option: Affecting the hippocampus
- Option: Controlling bodily movements

4. What type of diet showed enhanced memory-related activity in rats?

- Option: High-protein diet
- Option: Organic diet
- Option: Fats and sugars diet
- Option: Low-carb diet

5. What was the effect of a high-fat, high-sugar diet on rats?

- Option: Enhanced memory
- Option: Weakened memory signals
- Option: Improved cognitive functions
- Option: No effect on memory

6. What neurotransmitter is associated with memory formation in the hippocampus?

- Option: Dopamine
- Option: Serotonin
- Option: Acetylcholine
- Option: Adrenaline



True-False

7. The study suggests that food has no role in memory formation.
8. The research was conducted at the University of Southern California.
9. The findings may lead to new treatments based on acetylcholine signalling.
10. Fiber photometry was used to measure brain activity in mice.
11. Disruptions in acetylcholine signalling are linked to Alzheimer's disease.
12. Healthy diets were proven to have adverse effects on memory in rats.

Gap-Fill

13. Food is crucial in various life events, including weddings and family _____.
14. Scott Kanoski is a biologist at the University of _____.
15. Signals travel through the _____ nerve from the gut to the brain.
16. The study shows a link between diet and memory _____.
17. Rats consuming unhealthy 'junk food' displayed weakened memory _____.
18. More research is needed to confirm these findings in _____.

Answer

Multiple Choice: 1. Scott Kanoski 2. Nature Communications 3. Affecting the hippocampus 4. Fats and sugars diet 5. Weakened memory signals 6. Acetylcholine

True-False: 7. False 8. True 9. True 10. False 11. True 12. False

Gap-Fill: 13. dinners 14. Southern California 15. vagus 16. formation 17. signals 18. humans

CATEGORY

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Date Created

2026/07/30

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