



Natural Hormone May Reverse Obesity by Acting on Brain

Description

A hormone found to reverse obesity in mice has revealed important insights into how the brain regulates body weight. Researchers at the University of Oklahoma studied fibroblast growth factor 21 (FGF21) and discovered that it affects a crucial brain area involved in appetite and metabolism. This area is also influenced by popular weight-loss medications known as GLP-1 drugs. Their research was published in the journal *Cell Reports*.

Unlike other metabolic signals that target organs like the liver, FGF21 primarily operates through the brain. There is increasing interest in FGF21, particularly as drugs that target its pathway are being developed for treating metabolic dysfunction-associated steatohepatitis (MASH), a severe liver condition linked to obesity and insulin resistance.

The study, led by Dr. Matthew Potthoff, identified the hindbrain as the main site where FGF21 acts. This region is vital for managing essential functions such as hunger, energy balance, and nausea. Potthoff noted that previous research showed FGF21 signals the brain instead of the liver, but the specific brain area was unknown until now. Surprisingly, it appears that the hormone communicates with the hindbrain rather than the hypothalamus, where other body weight regulators are thought to act.

FGF21 specifically targets areas in the hindbrain called the nucleus of the solitary tract and the area postrema. This pathway is essential for FGF21 to exert its effects on metabolism and weight loss.

Potthoff hopes this research will lead to targeted therapies for obesity and MASH that minimise side effects commonly associated with FGF21 analogs, such as gastrointestinal issues. He emphasised the need for further studies to confirm if this brain circuit can help reverse MASH as well.

Vocabulary List:

1. **hormone** //ˈhɔːmɒn// (noun): a chemical made by the body to control activity
2. **reverse** //rɪˈvɜːs// (verb): make something return to an earlier state
3. **regulates** //ˈrɛɡjəˌleɪts// (verb): control how something works or happens
4. **metabolism** //məˈtæbəlɪzəm// (noun): the chemical processes in a living body
5. **pathway** //ˈpæθˌweɪ// (noun): a route or series of steps something follows
6. **hindbrain** //ˈhaɪndˌbreɪn// (noun): the lower back part of the brain

Comprehension Questions



Multiple Choice

1. What hormone is studied for its role in reversing obesity in mice?

- Option: GLP-1
- Option: FGF21
- Option: Insulin
- Option: Leptin

2. Which journal published the research on FGF21?

- Option: Nature
- Option: Cell Reports
- Option: The Lancet
- Option: Science

3. What condition is associated with metabolic dysfunction that researchers are targeting with drugs related to FGF21?

- Option: Type 2 diabetes
- Option: Hypertension
- Option: MASH
- Option: Hyperthyroidism

4. Who led the study on FGF21 at the University of Oklahoma?

- Option: Dr. John Smith
- Option: Dr. Matthew Potthoff
- Option: Dr. Sarah Johnson
- Option: Dr. Emily Davis

5. Which part of the brain was identified as the main site where FGF21 acts?

- Option: Cerebral cortex
- Option: Hindbrain
- Option: Hypothalamus
- Option: Amygdala

6. What does FGF21 primarily operate through?

- Option: The liver
- Option: The pancreas
- Option: The brain
- Option: The intestines



True-False

7. FGF21 primarily signals the liver to regulate body weight.
8. Dr. Matthew Potthoff was involved in the study of FGF21 conducted at the University of Oklahoma.
9. The nucleus of the solitary tract is a part of the hindbrain affected by FGF21.
10. GLP-1 drugs target the same pathway as FGF21.
11. The hypothalamus is the specific brain area where FGF21 communicates.
12. FGF21 analogs are linked to severe gastrointestinal issues.

Gap-Fill

13. The hormone FGF21 was found to affect the brain area involved in appetite and metabolism, specifically targeting the _____ area.
14. MASH stands for metabolic dysfunction-associated _____ hepatitis.
15. Dr. Potthoff's research hopes to lead to therapies that minimize gastrointestinal _____ associated with FGF21.
16. The brain region specifically targeted by FGF21 includes the nucleus of the solitary tract and the area _____.
17. Unlike other metabolic signals that primarily target the liver, FGF21 primarily operates through the _____.
18. Further studies are needed to confirm if FGF21 can help reverse _____ as well.

Answer

Multiple Choice: 1. FGF21 2. Cell Reports 3. MASH 4. Dr. Matthew Potthoff 5. Hindbrain 6. The brain
True-False: 7. False



8. True 9. True 10. True 11. False 12. True

Gap-Fill: 13. hindbrain 14. steatohepatitis 15. issues 16. postrema 17. brain 18. MASH

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. What term is used to describe something that has been made dirty or unclean?
Option: Contaminated
Option: Processed
Option: Purified
Option: Sterilized
2. Which of the following is commonly used to kill bacteria and viruses on surfaces?
Option: Disinfectant
Option: Moisturizer
Option: Antibiotic
Option: Astringent
3. What type of agent helps to prevent the growth of microorganisms?
Option: Antimicrobial
Option: Analgesic
Option: Antipyretic
Option: Antiseptic
4. What term describes a system that can grow in size or capacity?
Option: Scalable
Option: Static
Option: Limited
Option: Fixed
5. What verb means to imitate or replicate the behavior or appearance of something?
Option: Mimic
Option: Modify
Option: Create
Option: Inhibit
6. What term refers to surface structures at the nano-scale used to enhance material properties?
Option: Nanotextured
Option: Textured
Option: Smooth



Option: Polished

7. What is the professional title of a doctor who specializes in skin conditions?

- Option: Dermatologist
- Option: Pediatrician
- Option: Oncologist
- Option: Cardiologist

8. What is the term for a type of cancer that starts in the skin or tissues that line organs?

- Option: Carcinoma
- Option: Sarcoma
- Option: Leukemia
- Option: Melanoma

9. Which type of skin cancer arises from melanocytes, the cells that produce pigment?

- Option: Basal Cell Carcinoma
- Option: Squamous Cell Carcinoma
- Option: Melanoma
- Option: Melanocyte

10. What is the process of discovering or identifying something called?

- Option: Detection
- Option: Prevention
- Option: Isolation
- Option: Amplification

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. Adequate sleep is crucial for maintaining overall health and well-being.

12. The evidence will warrant further investigation into the matter.

13. Insulin is a hormone that regulates blood sugar levels in the body.

14. Scientists are working to reverse the effects of aging through various studies.

15. The endocrine system regulates various body functions through hormone secretion.

16. Exercise plays a key role in boosting a person's metabolism.

17. The brain has complex neural pathways that govern behavior and thought.



18. The hindbrain controls many vital functions such as heartbeat and breathing.
19. Certain legumes contain lectin, which can affect nutrient absorption.
20. Mucus serves as a protective barrier in the respiratory and digestive systems.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The skin serves as a barrier between the internal body and external environment.
22. The security system was breached, exposing sensitive information.
23. Galactose is a simple sugar that is part of lactose, found in milk.
24. Some bacteria have become resistant to commonly used antibiotics.
25. The results were consistent across multiple trials, confirming the hypothesis.
26. Teachers aim to engage students through interactive learning methods.
27. A balanced diet consists of nutritious foods that provide essential vitamins.
28. Stabilizing the mixture requires careful control of temperature and pressure.
29. Hormonal changes during puberty significantly affect growth and mood.
30. The distribution of resources can impact economic equality.

Answer

Multiple Choice: 1. Contaminated 2. Disinfectant 3. Antimicrobial 4. Scalable 5. Mimic 6. Nanotextured
7. Dermatologist 8. Carcinoma 9. Melanoma 10. Detection

Gap-Fill: 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.

Matching sentence: 1. barrier 2. breached 3. galactose 4. resistant 5. consistent 6. engage 7. nutritious
8. stabilize 9. hormonal 10. distribution

CATEGORY

1. Health - LEVEL5

POST TAG



1. brain
2. ESL learning
3. esl news
4. hormone
5. Level 5
6. obesity

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