Gut Protein Shown to Neutralise Harmful Bacteria

Description

Researchers have identified a specific protein in the gut that plays a key role in combating the spread of bacteria. This discovery could lead to potential treatments for conditions like inflammatory bowel disease.

The protein, known as intelectin-2, has been recognised by scientists, but its specific function within the gastrointestinal (GI) tract was previously unclear. Intelectin-2 is classified as a lectin, a type of protein that binds to particular sugar molecules.

A team from the Massachusetts Institute of Technology (MIT) has revealed that intelectin-2 operates in two ways. Firstly, it connects mucus molecules that line the GI tract, enhancing the protective mucus barrier around intestinal tissues. Secondly, if the barrier is breached, intelectin-2 identifies and traps various bacterial cells, either inhibiting their growth or killing them outright.

This dual action of intelectin-2 serves both defensive and offensive purposes for maintaining health. Researchers employed multiple methods to examine the protein's activity, including studies on mouse tissue, gut bacteria from both mice and humans, and the human and mouse versions of the protein in a laboratory setting.

Notably, intelectin-2 targets galactose, a simple sugar present in mucus and on the surface of some bacterial cells associated with GI infections. When intelectin-2 binds to and traps these bacteria, they appear to deteriorate over time, presumably due to damage to their outer membranes.

Importantly, some bacteria that intelectin-2 neutralises are resistant to antibiotics, which enhances the significance of this research for drug development.

The scientists believe that intelectin-2's abilities could lead to innovative treatments, either by developing drugs that mimic its actions or by enhancing its functions within the body. Their findings were published in *Nature Communications*.

Vocabulary List:

1. **lectin** /ˈlɛktɪn/ (noun): a protein that binds specific sugar molecules
2. **mucus** /ˈmjuːkəs/ (noun): a slippery substance that lines some body parts
3. **barrier** /ˈbæriər/ (noun): something that blocks or protects an area
4. **breached** /briːtʃt/ (adjective): broken so protection is no longer effective
5. **galactose** /gəˈlæktoʊs/ (noun): a simple sugar found in some foods and cells
6. **resistant** /rɪˈzɪstənt/ (adjective): not easily affected or killed by something

Comprehension Questions

Multiple Choice

1. What type of protein is intelectin-2 classified as?

   Option: Enzyme
   Option: Hormone
   Option: Lectin
   Option: Antibody

2. Which institution's team conducted the research on intelectin-2?

   Option: Harvard University
   Option: Stanford University
   Option: Massachusetts Institute of Technology
   Option: California Institute of Technology

3. What is one of the primary functions of intelectin-2?

   Option: Binding to fatty acids
   Option: Enhancing protective mucus barrier
   Option: Stimulating insulin production
   Option: Absorbing nutrients

4. What simple sugar does intelectin-2 target?

   Option: Glucose
   Option: Fructose
   Option: Galactose
   Option: Sucrose

5. What could intelectin-2's abilities potentially lead to in terms of treatments?

   Option: Vaccines
   Option: Antibiotics
   Option: Innovative drug treatments
   Option: Surgical procedures

6. In which journal were the findings on intelectin-2 published?

   Option: Science

Option: Nature
Option: Nature Communications
Option: The Lancet

True-False

7. Intelectin-2 is only involved in protecting the intestinal tissues without any offensive action.

8. The research on intelectin-2 included studies on both mouse and human tissues.

9. Galactose is not found in mucus but is targeted by intelectin-2.

10. Intelectin-2 can neutralise some antibiotic-resistant bacteria.

11. The specific function of intelectin-2 was clear to scientists before the recent research.

12. The dual action of intelectin-2 serves to maintain health.

Gap-Fill

13. Researchers have identified a specific protein in the gut known as _____.

14. Intelectin-2 enhances the protective mucus barrier around intestinal _____.

15. When intelectin-2 binds to bacteria, they appear to deteriorate over _____.

16. Intelectin-2's dual actions include connecting mucus molecules and _____ bacterial cells.

17. This research could lead to drugs that mimic intelectin-2’s _____.

18. The findings on intelectin-2 were published in _____ Communications.

Answer

Multiple Choice: 1. Lectin 2. Massachusetts Institute of Technology 3. Enhancing protective mucus barrier 4. Galactose 5. Innovative drug treatments 6. Nature Communications
True-False: 7. False 8. True 9. False 10. True 11. False 12. True
Gap-Fill: 13. intelectin-2

14. tissues 15. time 16. trapping 17. actions 18. Nature

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. ESL learning
2. esl news
3. gut protein
4. Level 5
5. neutralize bacteria

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