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## Special Gut Protein Neutralises Bacteria, Study Finds

### Description

Researchers have found that a specific protein in the gut plays an important role in fighting bacteria. This discovery could help create treatments for diseases like inflammatory bowel disease.

The protein, called intelectin-2, is not new, but its function in the gastrointestinal (GI) tract was unclear. Intelectin-2 belongs to a group of proteins known as lectins, which attach to certain sugar molecules.

A team from MIT discovered that intelectin-2 helps in two ways. First, it connects mucus molecules in the GI tract, making the mucus barrier stronger to protect the intestinal tissues. If this barrier is damaged, intelectin-2 can also recognise and trap bacterial cells, either stopping their growth or killing them.

The researchers used various methods to study intelectin-2, including examining mouse and human tissue. They found that intelectin-2 targets galactose, a simple sugar found in mucus and on some bacterial surfaces. When it binds to bacteria, the bacteria break down over time.

Some of the bacteria that intelectin-2 fights have become resistant to antibiotics. These include *Staphylococcus aureus*, which can cause serious infections. Researchers believe that understanding and using proteins like intelectin-2 may lead to new ways to treat bacterial infections.

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### Vocabulary List:

1. **inflammatory** //ɪnˈflæmə,tɔːri// (adjective): causing swelling and redness in the body
2. **gastrointestinal** //,gæstrəʊɪnˈtɛstɪnəl// (adjective): relating to the stomach and intestines
3. **lectins** //ˈlektɪnz// (noun): proteins that stick to certain sugar molecules
4. **mucus** //ˈmjuːkəs// (noun): thick liquid that protects body surfaces
5. **galactose** //gəˈlæktəʊs// (noun): a simple sugar found in milk and mucus
6. **resistant** //rɪˈzɪstənt// (adjective): not affected by a drug or treatment

### Comprehension Questions

#### Multiple Choice

1. What is the name of the protein identified to play a role in fighting bacteria?



- Option: Lectin
- Option: Intelectin-1
- Option: Intelectin-2
- Option: Galactose

2. Which diseases could treatments based on intelectin-2 potentially address?

- Option: Inflammatory bowel disease
- Option: Diabetes
- Option: Cancer
- Option: Heart disease

3. What group of proteins does intelectin-2 belong to?

- Option: Enzymes
- Option: Hormones
- Option: Lectins
- Option: Antibodies

4. What simple sugar does intelectin-2 target?

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

5. Which type of tissue was examined in the research study?

- Option: Skin tissue
- Option: Muscle tissue
- Option: Mouse and human tissue
- Option: Bone tissue

6. What can intelectin-2 do when the mucus barrier is damaged?

- Option: Enhance digestion
- Option: Recognise and trap bacterial cells
- Option: Reduce inflammation
- Option: Repair the barrier

### True-False

7. Intelectin-2 is a newly discovered protein.



8. Intelectin-2 helps to strengthen the mucus barrier in the GI tract.
9. The research found that intelectin-2 can accelerate bacterial growth.
10. Some bacteria that intelectin-2 fights are resistant to antibiotics.
11. Intelectin-2 connects to sugar molecules in the blood.
12. Researchers believe that proteins like intelectin-2 can help in treating bacterial infections.
13. Researchers have found that a specific protein in the gut plays an important role in fighting bacteria. This discovery could help create treatments for diseases like inflammatory bowel disease \_\_\_\_ .

### Gap-Fill

13. Researchers have found that a specific protein in the gut plays an important role in fighting bacteria. This discovery could help create treatments for diseases like inflammatory bowel disease \_\_\_\_\_ .
14. The protein, called intelectin-2, is not new, but its function in the gastrointestinal (GI) tract was \_\_\_\_\_ .
15. Intelectin-2 helps in two ways. First, it connects \_\_\_\_\_ molecules in the GI tract, making the mucus barrier stronger.
16. When it binds to bacteria, the bacteria break down over \_\_\_\_\_ .
17. Researchers used various methods to study intelectin-2, including examining mouse and \_\_\_\_\_ tissue.
18. Some of the bacteria that intelectin-2 fights have become \_\_\_\_\_ to antibiotics.

### Answer

**Multiple Choice:** 1. Intelectin-2 2. Inflammatory bowel disease 3. Lectins 4. Galactose 5. Mouse and human tissue



6. Recognise and trap bacterial cells

**True-False:** 7. False 8. True 9. False 10. True 11. False 12. True 13. False

**Gap-Fill:** 13. 14. unclear 15. mucus 16. time 17. human 18. resistant

## Vocabulary quizzes

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

1. What are microorganisms that can cause disease in living organisms?

- Option: Bacteria
- Option: Viruses
- Option: Fungi
- Option: Parasites

2. Which of the following is used to kill bacteria and viruses on surfaces?

- Option: Antibiotics
- Option: Disinfectants
- Option: Antiseptics
- Option: Vaccines

3. What term is used to describe bacteria that do not respond to antibiotics?

- Option: Sensitive
- Option: Vulnerable
- Option: Resistant
- Option: Infectious

4. What chemical substance transmits signals across a synapse between neurons?

- Option: Neurotransmitter
- Option: Hormone
- Option: Protein
- Option: Enzyme

5. What condition is characterized by hearing ringing or buzzing in the ears?

- Option: Hearing Loss
- Option: Tinnitus
- Option: Ear Infection
- Option: Vertigo

6. Which system is responsible for digestion and absorption of nutrients?

- Option: Nervous System
- Option: Respiratory System



- Option: Circulatory System
- Option: Gastrointestinal System

7. What accumulations in the brain are often associated with Alzheimer's disease?

- Option: Cysts
- Option: Tumors
- Option: Plaques
- Option: Lesions

8. What structural component helps maintain cell shape and transport within neurons?

- Option: Mitochondria
- Option: Microtubules
- Option: Ribosomes
- Option: Nuclei

9. What are the signs indicating the presence of a disease or condition?

- Option: Treatment
- Option: Symptoms
- Option: Diagnosis
- Option: Prevention

10. What type of response is the body's method of fighting injuries or infections?

- Option: Inflammatory
- Option: Antibiotic
- Option: Antigen
- Option: Viral

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

- 11. Viruses can invade \_\_\_\_\_ and reproduce within them.
- 12. It is important to use \_\_\_\_\_ to prevent infection in healthcare settings.
- 13. Some bacteria develop \_\_\_\_\_ to protect themselves against antibiotics.
- 14. Dopamine is a type of \_\_\_\_\_ that plays a key role in mood regulation.
- 15. Patients with \_\_\_\_\_ often experience hearing ringing or buzzing sounds.
- 16. The \_\_\_\_\_ tract plays a crucial role in digestion and nutrient absorption.



17. Amyloid \_\_\_\_\_ are linked to Alzheimer's disease and interfere with neuron function.
18. \_\_\_\_\_ are essential for maintaining the shape of neurons.
19. Fever and fatigue are common \_\_\_\_\_ of infection.
20. An \_\_\_\_\_ response is often seen in autoimmune diseases.

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

21. Viruses are smaller than bacteria and require a host to multiply.
22. Disinfectants are crucial for maintaining hygiene in medical facilities.
23. Antibiotic-resistant strains of bacteria pose a significant public health challenge.
24. Neurotransmitters are essential for sending signals between nerve cells.
25. Tinnitus can be caused by exposure to loud noises over time.
26. The gastrointestinal system includes the esophagus, stomach, and intestines.
27. Plaques can build up in the brain and disrupt normal cognitive function.
28. Microtubules are vital for cell division and maintaining cell structure.
29. Recognizing the symptoms early can improve treatment outcomes.
30. Inflammatory responses are essential for healing but can also cause damage if excessive.

**Answer**

**Multiple Choice:** 1. Viruses 2. Disinfectants 3. Resistant 4. Neurotransmitter 5. Tinnitus 6. Gastrointestinal System 7. Plaques 8. Microtubules 9. Symptoms 10. Inflammatory

**Gap-Fill:** 11. host cells 12. disinfectants 13. resistance 14. neurotransmitter 15. tinnitus 16. gastrointestinal 17. plaques 18. Microtubules 19. symptoms 20. inflammatory

**Matching sentence:** 1. viruses 2. disinfectants 3. resistant 4. neurotransmitter 5. tinnitus 6. gastrointestinal 7. plaques 8. microtubules 9. symptoms 10. inflammatory

**CATEGORY**

1. Health - LEVEL2



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4. neutralize bacteria
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aimeeyoung99

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