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# New Plastic Film Design Destroys Viruses

## Description

Every day, people touch many surfaces, like kitchen counters, public transport handrails, and phone screens. Germs and viruses can easily spread through these surfaces.

Infection often happens when someone touches a contaminated surface and then their face. Although chemical cleaners can disinfect surfaces, they may harm the environment or cause germs to resist medicines, a problem called antimicrobial resistance.

Recently, researchers developed a new type of thin plastic surface with tiny features called nanotextures, as small as a billionth of a meter. These mimic surfaces found on insect wings, which can break apart viruses, specifically targeting a virus known as hPIV-3.

This new material could help reduce the spread of diseases on surfaces like hospital equipment and phones. Current disinfection methods need the surface to stay wet to kill germs, which isn't always practical, and can use harsh chemicals.

In nature, some insect wings naturally kill bacteria. Inspired by this, researchers created a material with tiny pillars that pierce and destroy viruses. In tests, up to 94% of hPIV-3 virus particles were damaged in an hour.

The technology could be used in many settings, including food packaging and public transport. Although these surfaces are durable, they face wear and tear over time. This approach may offer a new way to protect against viruses without relying on chemicals.

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## Vocabulary List:

1. **contaminated** //kən'tæmɪ,neɪtɪd// (adjective): covered with germs or dirty things
2. **disinfect** //,dɪsɪn'fekt// (verb): use chemicals to kill germs on something
3. **antimicrobial** //,æntɪmaɪ'krɒʊbiəl// (adjective): able to stop or kill germs and bacteria
4. **nanotextures** //,nænoʊ'tekstʃəz// (noun): very small surface shapes much smaller than cells
5. **pierce** //pɪrs// (verb): make a hole through with something sharp
6. **mimic** //ˈmɪmɪk// (verb): act like or copy something else

## Comprehension Questions



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## Multiple Choice

1. What is the size of the tiny features on the new plastic surface developed by researchers?

- Option: One meter
- Option: One millimeter
- Option: One billionth of a meter
- Option: One centimeter

2. What type of virus does the new material specifically target?

- Option: hPIV-3
- Option: COVID-19
- Option: Influenza
- Option: Ebola

3. What is a major drawback of current disinfection methods mentioned?

- Option: They are always effective
- Option: They require surfaces to remain wet
- Option: They are environmentally friendly
- Option: They use no chemicals

4. What inspired researchers to create the new material?

- Option: Plastic surfaces
- Option: Chemical cleaners
- Option: Insect wings
- Option: Hospital equipment

5. Up to what percentage of hPIV-3 virus particles were damaged in the tests?

- Option: 50%
- Option: 75%
- Option: 94%
- Option: 100%

6. In which settings could the new technology be used?

- Option: Only hospitals
- Option: Food packaging and public transport
- Option: Private homes
- Option: Only schools



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### True-False

7. Germs and viruses can spread through surfaces like kitchen counters and phone screens.
8. Chemical cleaners always benefit the environment.
9. The new plastic surface is designed to mimic surfaces found on insect wings.
10. Current disinfection methods do not require any specific conditions to be effective.
11. Researchers have found a way to destroy viruses using chemical means only.
12. The new material can help reduce the spread of diseases on surfaces.

### Gap-Fill

13. Infection often happens when someone touches a contaminated surface and then their \_\_\_\_\_ .
14. This new material could help reduce the spread of \_\_\_\_\_ on surfaces like hospital equipment.
15. Some insect wings naturally kill \_\_\_\_\_ .
16. The technology could be used in many settings, including food packaging and \_\_\_\_\_ .
17. Although these surfaces are durable, they face wear and tear over \_\_\_\_\_ .
18. The problem of antimicrobial resistance may occur when chemical cleaners \_\_\_\_\_ .

### Answer

**Multiple Choice:** 1. One billionth of a meter 2. hPIV-3 3. They require surfaces to remain wet 4. Insect wings 5. 94% 6. Food packaging and public transport

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

**Gap-Fill:** 13. face



14. diseases 15. bacteria 16. public transport 17. time 18. harm

## Vocabulary quizzes

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

1. What does the term 'metabolism' refer to?

- Option: The process of food ingestion
- Option: The chemical reactions that occur within a living organism
- Option: The physical structure of a cell
- Option: The movement of nutrients within the body

2. What classification is given to an individual with a body mass index (BMI) of 30 or higher?

- Option: Overweight
- Option: Obese
- Option: Normal weight
- Option: Underweight

3. What hormone is often referred to as the 'stress hormone'?

- Option: Insulin
- Option: Cortisol
- Option: Adrenaline
- Option: Thyroxine

4. Which process involves killing germs and bacteria on surfaces?

- Option: Sanitize
- Option: Disinfect
- Option: Sterilize
- Option: Clean

5. What is the most serious type of skin cancer?

- Option: Basal cell carcinoma
- Option: Squamous cell carcinoma
- Option: Melanoma
- Option: Carcinoma in situ

6. What term describes the condition of being subjected to something harmful?



- Option: Isolation
- Option: Exposure
- Option: Seclusion
- Option: Protection

7. Which type of agent is used to inhibit the growth of microbes?

- Option: Antiseptic
- Option: Antimicrobial
- Option: Antibiotic
- Option: Antiviral

8. What term is used for something that has been made impure or unclean by contact with a harmful substance?

- Option: Pure
- Option: Contaminated
- Option: Filtered
- Option: Sterilized

9. What is the ability of an organism to continue living called?

- Option: Reproduction
- Option: Survival
- Option: Metabolism
- Option: Adaptation

10. What do we call the act of taking in food and drink?

- Option: Digestion
- Option: Consume
- Option: Ingestion
- Option: Absorption

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

- 11. The \_\_\_\_\_ of an object is its mass per unit volume.
- 12. Dietary \_\_\_\_\_ can help in weight management.
- 13. Prolonged \_\_\_\_\_ to UV radiation can increase the risk of skin cancer.
- 14. Vaccination can help prevent the \_\_\_\_\_ of infectious diseases.
- 15. Regular check-ups can help \_\_\_\_\_ potential health issues.



16. He felt \_\_\_\_\_ after listening to the constant noise.
17. Meeting client \_\_\_\_\_ is crucial for business success.
18. Poor communication can \_\_\_\_\_ team effectiveness.
19. A nutrient \_\_\_\_\_ can lead to various health problems.
20. Some materials can \_\_\_\_\_ the properties of natural substances.

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

21. Antimicrobial agents are used to combat infections by inhibiting the growth of bacteria.
22. Carcinoma is a type of cancer that originates in epithelial tissue.
23. Cortisol helps to regulate metabolism and the body's response to stress.
24. Infrasound refers to sound waves that are below the frequency range of human hearing.
25. Contaminated water can pose serious health risks to those who consume it.
26. The density of a substance determines whether it will float or sink in water.
27. Obese individuals are at a higher risk for developing chronic health conditions.
28. The lack of information during the crisis was unsettling for the public.
29. The survival of endangered species relies heavily on conservation efforts.
30. Many people fail to properly consume the recommended daily intake of fruits and vegetables.

**Answer**

**Multiple Choice:** 1. The chemical reactions that occur within a living organism 2. Obese 3. Cortisol 4. Disinfect 5. Melanoma 6. Exposure 7. Antimicrobial 8. Contaminated 9. Survival 10. Consume

**Gap-Fill:** 11. density 12. restriction 13. exposure 14. spread 15. prevent 16. irritated 17. expectations 18. hinder 19. deficit 20. mimic

**Matching sentence:** 1. antimicrobial 2. carcinoma 3. cortisol 4. infrasound 5. contaminated 6. density 7. obese 8. unsettling 9. survival 10. consume



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## CATEGORY

1. Health - LEVEL3

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aimeeyoung99

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