Innovative Plastic Film Destroys Viruses Upon Contact

Description

Every day, people touch many surfaces like kitchen counters, bus handrails, work desks, and phone screens. Germs and viruses can spread easily through these contact points, often infecting people when they touch their face after contact with contaminated surfaces.

While surfaces can be cleaned with chemical products, these can harm the environment and may lead to germs becoming resistant to medicines. Researchers recently published a study in *Advanced Science* where they developed a thin plastic surface with nanoscale features, mimicking the surface of insect wings. This can physically destroy viruses, such as the human parainfluenza virus type 3 (hPIV-3), offering a more environmentally friendly way to stop disease spread.

Typical disinfection involves cleaning surfaces, which can be difficult because disinfectants need to remain wet for a while to work. Surfaces also quickly become contaminated again. Existing antiviral coatings, often using materials like graphene, can pose health risks and become less effective as their active ingredients weaken.

The journey to develop this new virus-bursting surface began over a decade ago. Initially, researchers aimed for smooth surfaces to repel germs, but discovered that rough, textured surfaces inspired by insect wings were more effective at killing bacteria and viruses through physical means.

In the latest study, scientists created a lightweight and flexible film with tiny pillars that tear apart virus particles. Tests showed that up to 94% of hPIV-3 particles were destroyed within an hour. This material could be scaled for various uses, from food packaging to public transport and medical equipment. Despite their durability, these surfaces will eventually degrade, but they offer a promising alternative to chemical methods in fighting germs.

Vocabulary List:

1. **contaminated** /kənˈtæməˌneɪtɪd/ (adjective): made dirty or unsafe with germs or chemicals
2. **nanoscale** /ˈneɪnoʊskeɪl/ (adjective): extremely small; much smaller than cells
3. **mimicking** /ˈmɪmɪkɪŋ/ (verb): copying the way something looks or works
4. **physically** /ˈfɪzɪkli/ (adverb): by using real things or physical forces
5. **pillars** /ˈpɪlərz/ (noun): small upright parts that stand up from surfaces
6. **resistant** /rɪˈzɪstənt/ (adjective): able to fight against something harmful

Comprehension Questions

Multiple Choice

1. What surfaces do people commonly touch that can spread germs?

   Option: Kitchen counters
   Option: Smartphones
   Option: Bus handrails
   Option: All of the above

2. What did researchers develop as a new method for virus destruction?

   Option: Chemical disinfectants
   Option: Smooth surfaces
   Option: Thin plastic surfaces with nanoscale features
   Option: Graphene coatings

3. What virus type was specifically mentioned in relation to the new surface developed by researchers?

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

4. How long did the tests show it took to destroy up to 94% of hPIV-3 particles?

   Option: 10 minutes
   Option: 30 minutes
   Option: 1 hour
   Option: 24 hours

5. What is a major downside of using chemical disinfectants?

   Option: They are too cheap
   Option: They can harm the environment
   Option: They are ineffective against viruses
   Option: They are hard to find

6. What was the original goal of the researchers over a decade ago?

   Option: To create a chemical disinfectant

Option: To create smooth surfaces to repel germs
Option: To invent new viruses
Option: To find a use for graphene

True-False

7. Researchers have found that smooth surfaces are more effective at killing bacteria and viruses.

8. Chemical cleaning products can lead to germs becoming resistant to medicines.

9. The new virus-bursting surface offers a promising alternative to chemical methods in fighting germs.

10. Surfaces need to remain wet for a long time to be effective when using disinfectants.

11. The developed thin plastic surface is heavier and less flexible than traditional surfaces.

12. The study was published in a journal titled Advanced Science.

Gap-Fill

13. Every day, people touch many surfaces like kitchen counters, _____ handrails, work desks, and phone screens.

14. Researchers developed a thin plastic surface with nanoscale features mimicking the _____ of insect wings.

15. Typical disinfection involves cleaning surfaces, but disinfectants need to remain wet for a while to _____.

16. Up to _____ of hPIV-3 particles were destroyed within an hour using the new surface.

17. Existing antiviral coatings can become less effective as their active ingredients _____.

18. Despite their durability, these surfaces will eventually _____, but they provide a

promising alternative.

Answer

Multiple Choice: 1. All of the above 2. Thin plastic surfaces with nanoscale features 3. hPIV-3 4. 1 hour 5. They can harm the environment 6. To create smooth surfaces to repel germs
True-False: 7. False 8. True 9. True 10. True 11. False 12. True
Gap-Fill: 13. bus 14. surface 15. work 16. 94% 17. weaken 18. degrade

CATEGORY

1. Health - LEVEL4

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