



Study Links Common Dental Issue to Breast Cancer Risk

Description

Recent research has uncovered an unexpected connection between oral health and breast cancer. Scientists found that a common bacterium linked to gum disease can enter the bloodstream and settle in breast tissue, leading to DNA damage and promoting the growth and spread of tumours.

The study, conducted by the Johns Hopkins Kimmel Cancer Center and the Bloomberg-Kimmel Institute for Cancer Immunotherapy, indicates that this bacterium not only affects the tissue but also makes cancer cells more aggressive and less responsive to treatment. Dr Dipali Sharma noted that the research was motivated by previous smaller studies that showed a link between periodontal disease and breast cancer.

Dr Sheetal Parida, the first author of the study, stated the team aimed to explore these connections further. They used mouse models and human breast cancer cells to investigate how the bacterium impacted breast tissue. The research revealed that when the bacterium was introduced into breast ducts, it caused inflammation and DNA damage, whereas when it entered the bloodstream, it significantly accelerated the growth of existing tumours.

The study also identified a crucial biological process: exposure to the bacterium damaged cellular DNA, activating repair mechanisms that could introduce errors. Additionally, it raised levels of a protein called PKCs, associated with cancer cell movement and resistance to chemotherapy.

While the findings highlight a potential link between oral microbes and the risk of breast cancer, further research is needed to understand its implications for patient care. Dr Sharma emphasized that these results suggest that various risk factors, including genetic ones like BRCA1 mutations, may interact with this bacterium, increasing breast cancer risk and tumour aggressiveness.

Vocabulary List:

1. **bacterium** //bæk'tɪriəm// (noun): a very small living thing that can cause disease
2. **bloodstream** //ˈblʌdstri:m// (noun): the flow of blood inside the body
3. **DNA** //di:en'eɪ// (noun): material in cells that has genetic instructions
4. **inflammation** //,ɪnflə'meɪʃən// (noun): swelling and pain as the body reacts
5. **resistance** //rɪ'zɪstəns// (noun): when a drug or treatment stops working well
6. **mutations** //mju:'teɪʃənz// (noun): small changes in genes that can affect cells

Comprehension Questions



Multiple Choice

1. What common bacterium is linked to gum disease and breast cancer?
Option: E. coli
Option: Streptococcus mutans
Option: Porphyromonas gingivalis
Option: Lactobacillus
2. Which research institution conducted the study on oral health and breast cancer?
Option: Harvard University
Option: Stanford University
Option: Johns Hopkins Kimmel Cancer Center
Option: Yale University
3. Who is the first author of the study?
Option: Dr Dipali Sharma
Option: Dr Sheetal Parida
Option: Dr John Doe
Option: Dr Jane Smith
4. What accelerates the growth of existing tumors according to the study?
Option: High sugar diet
Option: Bacterium entering the bloodstream
Option: Regular exercise
Option: Antibiotics
5. What risky protein levels were raised by the bacterium?
Option: PKCs
Option: EGFR
Option: HER2
Option: TP53
6. What does the bacterium cause when introduced into breast ducts?
Option: Cell death
Option: Inflammation and DNA damage
Option: Tumor regression
Option: Enhanced immunity



True-False

7. The study indicates that the bacterium makes cancer cells more responsive to treatment.
8. The research suggests a link between oral microbes and breast cancer risk.
9. Dr Dipali Sharma is the first author of the study.
10. The research was motivated by previous studies showing a link between periodontal disease and breast cancer.
11. The study used human breast cancer cells and dog models for investigation.
12. Further research is needed to understand the implications of the findings for patient care.

Gap-Fill

13. The common bacterium linked to gum disease can enter the bloodstream and settle in breast tissue, leading to DNA damage and promoting the growth and spread of _____.
14. Dr Sheetal Parida stated that the team aimed to explore these connections _____.
15. The study revealed that the bacterium caused inflammation and DNA damage when introduced into breast _____.
16. The exposure to the bacterium damaged cellular DNA, activating repair mechanisms that could introduce _____.
17. The findings suggest that various risk factors may interact with this bacterium, increasing breast cancer risk and tumour _____.
18. The study conducted by the Johns Hopkins Kimmel Cancer Center indicates that the bacterium makes cancer cells more aggressive and less _____ to treatment.



Answer

Multiple Choice: 1. Porphyromonas gingivalis 2. Johns Hopkins Kimmel Cancer Center 3. Dr Sheetal Parida
4. Bacterium entering the bloodstream 5. PKcs 6. Inflammation and DNA damage

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

Gap-Fill: 13. tumours 14. further 15. ducts 16. errors 17. aggressiveness 18. responsive

Vocabulary quizzes

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

1. What is a common use for a tampon?

Option: Contraception

Option: Menstrual hygiene

Option: Infection prevention

Option: Surgical assistance

2. Which of the following substances is considered toxic?

Option: Water

Option: Oxygen

Option: Lead

Option: Glucose

3. Which of the following is a primary symptom of fatigue?

Option: Increased energy

Option: Drowsiness

Option: Hyperactivity

Option: Euphoria

4. What is a single-celled organism classified as a bacterium?

Option: Virus

Option: Fungi

Option: Protozoa

Option: Eubacteria

5. The term 'inflate' typically refers to what action?



- Option: Deplete
- Option: Expand
- Option: Compress
- Option: Contract

6. What is the primary function of DNA?

- Option: Energy production
- Option: Genetic information storage
- Option: Cell respiration
- Option: Protein synthesis

7. What does the term 'discharge' refer to in medical terms?

- Option: Release of fluid
- Option: Infection
- Option: Surgery
- Option: Diagnosis

8. Microtubules are primarily involved in which cellular function?

- Option: Energy production
- Option: Structural support
- Option: Protein synthesis
- Option: Genetic replication

9. What is the body's natural response to infection or injury called?

- Option: Euphoria
- Option: Asthenia
- Option: Inflammation
- Option: Amnesia

10. What is a common environmental concern associated with hydrofluorocarbons?

- Option: Acid rain
- Option: Ozone depletion
- Option: Global warming potential
- Option: Water pollution

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

11. Certain chemicals can have a _____ effect on human health.

12. Toxic substances can _____ in the bloodstream over time.



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13. In nature, species often engage in _____ for resources.
 14. A scientific _____ is a proposed explanation for a phenomenon.
 15. Genetic _____ can lead to variations in a species.
 16. Proteins can _____ into larger structures called fibrils in diseases.
 17. The _____ is a fruit known for its numerous health benefits.
 18. Antibiotic _____ is a growing concern in medicine.
 19. A _____ is a substance used in cooling systems.
 20. The _____ of a substance defines the temperature at which it transitions from solid to liquid.

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

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21. Fluorescence is the emission of light by a substance that has absorbed light or other electromagnetic radiation.
22. Amyloidosis is a disorder characterized by the accumulation of amyloid proteins in organs and tissues.
23. Fibrils are thread-like structures formed by proteins and are associated with various diseases.
24. Ionocaloric materials are related to changes in thermal properties when ions are applied.
25. Global warming potential is a measure of how much heat a greenhouse gas traps in the atmosphere.
26. A compound is a substance formed when two or more elements chemically bond together.
27. Resistance refers to the ability of an organism to withstand harmful effects from antibiotics.
28. Many substances can be classified as toxic depending on their effects on biological organisms.
29. When a foreign object is lodged in the throat, it can obstruct breathing.
30. Hydrofluorocarbons are compounds often used in refrigeration that pose a risk to global warming.

Answer

Multiple Choice: 1. Menstrual hygiene 2. Lead 3. Drowsiness 4. Eubacteria 5. Expand 6. Genetic information storage 7. Release of fluid 8. Structural support 9. Inflammation 10. Global warming potential

Gap-Fill: 11. detrimental 12. accumulates 13. competing 14. hypothesis 15. mutations 16. aggregate 17. pomegranate 18. resistance 19. refrigerant 20. melting point

Matching sentence: 1. fluorescence 2. Amyloidosis 3. fibrils 4. Ionocaloric 5. Global warming potential 6. Compound 7. Resistance 8. Toxic 9. Lodged 10. Hydrofluorocarbons

CATEGORY

1. Health - LEVEL5

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3. Common dental problem
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