



HIV Drugs Paradox: Reducing Inflammation Boosts Virus in Brain

Description

HIV can harm the brain, causing memory and cognitive issues. Once in the brain, it remains there. HIV attacks helper T cells, a type of immune cell. These cells search the body, including the brain, for antigens, which are signs of infection. When they find antigens, they activate other cells to fight the infection.

HIV weakens the immune system by reducing helper T cells, increasing the risk of infections and leading to AIDS. Antiviral drugs can control HIV and protect T cells, but they struggle to reach the brain and spinal cord.

Research teams have tried to reduce HIV-related brain inflammation. However, a study with the Morrison Lab and Raeman Lab found that a therapy aimed at decreasing inflammation actually increased HIV levels in the brain.

T cells use proteins called integrins to move in the body. Some researchers think blocking integrins could stop HIV from entering the brain. A test with monkeys showed that blocking an integrin called alpha-4 increased HIV in the brain, reducing killer T cells that destroy infected cells.

The study found that helper T cells do not need alpha-4 to enter the brain, but killer T cells do. Targeting immune cells more precisely could help fight HIV in the brain.

Globally, over 40 million people had HIV in 2024, and 22% lacked treatment. More research is needed to improve treatments and help millions of patients.

Vocabulary List:

1. **cognitive** //ˈkɒɡ.nə.tɪv// (adjective): related to thinking, learning, and memory
2. **antigens** //ˈæn.tə.dʒənz// (noun): substances that make the immune system react
3. **antiviral** //ˌæn.tiˈvaɪrəl// (adjective): used to stop or control virus infections
4. **inflammation** //ˌɪn.fləˈmeɪ.ʃən// (noun): swelling and redness when the body is hurt
5. **integrins** //ˈɪn.təˌɡrɪnz// (noun): proteins on cells that help them move
6. **precisely** //prɪˈsaɪs.li// (adverb): in a very exact or correct way

Comprehension Questions



Multiple Choice

1. What type of cells does HIV primarily attack?

- Option: Killer T cells
- Option: Helper T cells
- Option: B cells
- Option: Macrophages

2. What is a potential consequence of the reduced number of helper T cells due to HIV?

- Option: Improved cognitive function
- Option: Increased risk of infections
- Option: Enhanced immune response
- Option: Decreased inflammation

3. What do antiviral drugs aim to do in the context of HIV?

- Option: Activate helper T cells
- Option: Reduce HIV levels
- Option: Prevent HIV from entering the brain
- Option: Increase brain inflammation

4. What did the study with Morrison Lab and Raeman Lab find about HIV therapy?

- Option: It decreased HIV levels
- Option: It had no effect
- Option: It increased HIV levels
- Option: It stopped HIV transmission

5. What integrin was found to be significant in HIV research?

- Option: Alpha-2
- Option: Alpha-4
- Option: Beta-1
- Option: Beta-2

6. In which year did over 40 million people globally have HIV?

- Option: 2020
- Option: 2022
- Option: 2024
- Option: 2026



True-False

7. HIV can harm the brain and cause memory issues.
8. Antiviral drugs easily reach the brain and spinal cord.
9. Killer T cells do not need integrins to enter the brain.
10. Globally, 22% of people with HIV lacked treatment in 2024.
11. Blocking integrins is believed to help HIV enter the brain.
12. Helper T cells search the body for antigens.

Gap-Fill

13. HIV attacks helper T cells, which search for _____ in the body.
14. HIV weakens the immune system by reducing helper T cells and leading to _____.
15. Research teams aim to reduce HIV-related brain _____.
16. The study found that helper T cells do not need alpha-4 to enter the _____.
17. In 2024, over 40 million people globally had _____.
18. More research is required to improve _____ and help patients.

Answer

Multiple Choice: 1. Helper T cells 2. Increased risk of infections 3. Reduce HIV levels 4. It increased HIV levels 5. Alpha-4 6. 2024

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

Gap-Fill: 13. antigens 14. AIDS 15. inflammation 16. brain 17. HIV 18. treatments

Vocabulary quizzes



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

1. What condition is characterized by weakened bones, making them more prone to fractures?

- Option: Arthritis
- Option: Osteoporosis
- Option: Scoliosis
- Option: Osteomyelitis

2. What substances are recognized by the immune system as foreign and can trigger an immune response?

- Option: Hormones
- Option: Antibodies
- Option: Antigens
- Option: Integrins

3. In biology, what term refers to structures that extend outward from a surface?

- Option: Contractions
- Option: Protrusions
- Option: Integration
- Option: Inflammation

4. Which of the following are often used to enhance dietary intake of vitamins and minerals?

- Option: Supplements
- Option: Placebo
- Option: Antivirals
- Option: Integrins

5. What term is used for experiments conducted to test new medical treatments?

- Option: Research
- Option: Studies
- Option: Trials
- Option: Evaluations

6. What term describes a system where decision-making is distributed rather than concentrated?

- Option: Integrated
- Option: Centralized
- Option: Decentralized
- Option: Hierarchical

7. What process do plants use to convert light energy into chemical energy?

- Option: Respiration
- Option: Photosynthesis
- Option: Metabolism



Option: Digestion

8. What term describes processes related to thinking, learning, and memory?

Option: Emotional

Option: Cognitive

Option: Sensory

Option: Motor

9. What term describes something that is advantageous or helpful?

Option: Detrimental

Option: Beneficial

Option: Neutral

Option: Adverse

10. What type of stress is associated with the damage caused by free radicals in the body?

Option: Oxidative

Option: Nitrosative

Option: Metabolic

Option: Physical

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

11. Integrins are proteins that facilitate cell-to-cell and cell-to-_____ interactions.

12. The body's response to injury often involves _____ as a means of protecting and healing.

13. Cells that have reached a state of senescence cease to divide and may contribute to _____ diseases.

14. Targeted therapies are designed to precisely identify and treat specific _____ in diseases.

15. A _____ is often used in clinical trials to provide a control group that receives no active treatment.

16. Biological _____ can prevent pathogens from entering the body and causing disease.

17. The results from the _____ group were compared to those of the control group to



determine effectiveness.

18. A systematic _____ of existing literature helps in understanding current trends in research.

19. Osteoporosis increases the risk of bone _____, especially in older adults.

20. Antiviral medications are often used to treat infections caused by _____ agents.

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

21. The coordinated movements of the muscles allow for smooth and efficient motion.
22. Chloroplasts are the organelles in plant cells responsible for conducting photosynthesis.
23. Muscle fibers are contractile cells that enable movement through contraction.
24. Recent studies have provided valuable insights into the mechanisms of immune response.
25. Health professionals often recommend supplements for those who have dietary deficiencies.
26. Understanding the context of a research study is crucial for interpreting its findings accurately.
27. The immune system plays a critical role in defending the body against infections and diseases.
28. Certain foods have been shown to have beneficial effects on overall health and wellness.
29. Antiviral drugs are designed to specifically target viral infections and inhibit their replication.
30. Inflammation is a natural response of the body to injury or infection, often characterized by redness and swelling.

Answer

Multiple Choice: 1. Osteoporosis 2. Antigens 3. Protrusions 4. Supplements 5. Trials 6. Decentralized
7. Photosynthesis 8. Cognitive 9. Beneficial 10. Oxidative

Gap-Fill: 11. matrix 12. inflammation 13. age-related 14. pathways 15. placebo 16. barriers 17. experimental
18. review 19. fractures 20. viral

Matching sentence: 1. coordinated 2. chloroplasts 3. contractile 4. insights 5. recommend 6. context 7.
immune 8. beneficial 9. antiviral 10. inflammation



CATEGORY

1. Health - LEVEL3

POST TAG

1. B1
2. brain
3. ESL learning
4. esl news
5. HIV
6. L3
7. Level 3

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Author

aimeeyoung99

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