



New Study Shows Cannabis Use Alters Epigenetics

Description

A recent study involving over 1,000 adults suggests that the use of cannabis may induce alterations in the human body's epigenome. The epigenome acts as a series of switches, controlling the activation or deactivation of genes to modify bodily functions.

Epidemiologist Lifang Hou from Northwestern University explained that they observed connections between cumulative marijuana use and various epigenetic markers over time. This study, published in 2023, shed light on the impact of cannabis on the epigenetic landscape.

According to Hou and a team of US researchers, cannabis is widely used in the United States, with around 49% of individuals having experimented with it. Despite the legalization of cannabis in some regions, its full health implications remain incompletely understood.

The researchers examined approximately 1,000 adults who had previously reported their cannabis consumption over a span of 20 years. Blood samples were provided at the 15- and 20-year marks, allowing for the analysis of DNA methylation levels, a key mechanism in epigenetic regulation.

The addition or removal of methyl groups from DNA, known as DNA methylation, is a crucial epigenetic modification that alters gene activity without changing the genetic sequence. These changes can be triggered by various environmental and lifestyle factors, potentially impacting future generations.

The study's findings revealed a multitude of DNA methylation markers associated with cannabis use, highlighting potential links to health outcomes. Despite these correlations, it's essential to note that this study does not definitively prove causation between cannabis use and epigenetic changes or health issues.

Epidemiologist Drew Nannini emphasized the need for further research to validate these associations across diverse populations and investigate the long-term effects of cannabis on health. This insightful study was published in *Molecular Psychiatry*, offering a detailed exploration of the intricate relationship between cannabis use and epigenetic factors.

This article, initially released in July 2023, provides valuable insights into the evolving understanding of marijuana's influence on the epigenome.

Vocabulary List:

1. **Epigenome** /,ɛpɪ'dʒɛn.oʊm/ (noun): The complete set of chemical changes to DNA and histone proteins that regulate gene expression without altering the DNA sequence.
2. **Methylation** /,mɛθɪ'leɪʃən/ (noun): The addition of a methyl group to a DNA molecule which can change the activity of a DNA segment without changing its sequence.



3. **Cumulative** /'kju:mjʊlətɪv/ (adjective): Increasing or increased in quantity degree or force by successive additions.
4. **Alterations** /,ɔ:ltə'reɪʃənz/ (noun): The act of modifying or changing something.
5. **Epidemiologist** /,ɛpɪ,dɪ:mi'ɒlədʒɪst/ (noun): A specialist in epidemiology which is the study of how diseases affect the health and illness of populations.
6. **Correlations** /,kɔ:rə'leɪʃənz/ (noun): Mutual relationships or connections between two or more things.

Comprehension Questions

Multiple Choice

1. What is the role of the epigenome in the human body?
Option: Controls gene activation and deactivation
Option: Regulates body temperature
Option: Aids in digestion
Option: Transmits nerve signals
2. How many adults were involved in the recent study on cannabis and the epigenome?
Option: 500
Option: 750
Option: 1,000
Option: 1,500
3. What percentage of individuals in the United States have experimented with cannabis according to the study?
Option: 25%
Option: 35%
Option: 49%
Option: 60%
4. What mechanism in epigenetic regulation was analyzed using blood samples in the study?
Option: Protein synthesis
Option: RNA splicing
Option: DNA replication
Option: DNA methylation
5. What does DNA methylation alter without changing?



- Option: The genetic sequence
- Option: The number of chromosomes
- Option: The cell membrane structure
- Option: The cell nucleus size

6. Who emphasized the need for further research on the associations between cannabis use and health outcomes?

- Option: Lifang Hou
- Option: Drew Nannini
- Option: Unknown US researchers
- Option: Molecular Psychiatry

True-False

- 7. The study definitively proves causation between cannabis use and epigenetic changes.
- 8. DNA methylation is a key mechanism in epigenetic regulation.
- 9. Cannabis is not widely used in the United States.
- 10. The study on cannabis and epigenetic markers was published in 2021.
- 11. DNA methylation alters gene activity by changing the genetic sequence.
- 12. Further research is not needed to validate associations between cannabis use and health outcomes.

Gap-Fill

13. DNA methylation is a process where methyl groups are added or removed from DNA, impacting gene activity without altering the genetic sequence. These changes can be influenced by various _____ and _____ factors.

14. The researchers examined approximately 1,000 adults over a span of _____ years to assess the impact of cannabis use on the epigenome.

15. Epidemiologist Lifang Hou and a team of US researchers observed connections between cumulative



marijuana use and various _____ markers over time.

16. Despite the legalization of cannabis in some regions, its full health implications remain incompletely _____.

17. Epidemiologist Drew Nannini emphasized the need for further research to validate associations across diverse populations and investigate the long-term effects of cannabis on _____.

18. This study does not definitively prove _____ between cannabis use and epigenetic changes or health issues.

Answer

Multiple Choice: 1. Controls gene activation and deactivation 2. 1,000 3. 49% 4. DNA methylation 5. The genetic sequence 6. Drew Nannini

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

Gap-Fill: 13. Array 14. 20 15. epigenetic 16. understood 17. health 18. causation

Vocabulary quizzes

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

1. A consortium refers to:

- Option: A group of individuals with shared interests
- Option: A solo business enterprise
- Option: A state government organization
- Option: An independent research institute

2. Toxicity is a term used to describe:

- Option: The medicinal benefits of a substance
- Option: The harmful effects of a substance on living organisms
- Option: The taste of a particular chemical compound
- Option: The color of a poisonous gas

3. A chronic condition is one that is:

- Option: Temporary and short-lived



- Option: Fatal and incurable
- Option: Severe but brief
- Option: Persisting over a long period of time

4. Cognitive processes involve:

- Option: Physical movements and reflexes
- Option: Brain functions like thinking and memory
- Option: Emotional responses and reactions
- Option: Respiratory and circulatory activities

5. Enhancing means:

- Option: Diminishing or reducing
- Option: Improving or making better
- Option: Maintaining at current levels
- Option: Modifying to be different

6. Proliferation refers to:

- Option: Decrease in population
- Option: Rapid increase or growth
- Option: Stabilization of numbers
- Option: High mortality rate

7. Being meticulous involves:

- Option: Careful attention to detail
- Option: Hastily completing tasks
- Option: Being reckless
- Option: Lacking concern for accuracy

8. Correlations refer to:

- Option: Causal relationships
- Option: Unrelated factors
- Option: Negative outcomes
- Option: Statistical associations between variables

9. Neuroticism is characterized by:

- Option: Stability and calmness
- Option: Excessive worry and anxiety
- Option: Outgoing and sociable behavior
- Option: Confidence and assertiveness

10. Vascular pertains to:

- Option: Bones and muscles
- Option: Immune system



- Option: Blood vessels
Option: Digestive system

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

11. Hazards are potential sources of _____ to health or the environment.
12. The study of changes in gene expression caused by modification of the _____ rather than alteration of the genetic code itself is called epigenetics.
13. Smoking is a habit that has many _____ effects on health especially on the lungs and heart.
14. Being _____ in unhealthy eating habits can lead to obesity and other health issues.
15. The concept of _____ in molecules refers to their mirror-image symmetry.
16. Regular exercise has a _____ impact on overall health and well-being.
17. An _____ studies the patterns causes and effects of health and disease conditions in defined populations.
18. Taking the prescribed _____ is important to manage certain medical conditions.
19. To _____ the negative effects of stress individuals can practice relaxation techniques.
20. The _____ impact of small lifestyle choices can significantly affect long-term health outcomes.

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

21. The reckless actions of the driver led to severe repercussions for all involved.

22. Her meticulous attention to detail and conscientiousness made her a valuable team member.



23. Various psychological disorders can impact an individual's daily functioning and well-being.
24. Consuming foods rich in flavanols may have positive effects on heart health.
25. The alterations made to the original design improved the efficiency of the product.
26. The process of methylation plays a role in gene expression and regulation.
27. Regular exercise is beneficial for cardiovascular health and overall fitness.
28. Fruits and vegetables are rich sources of antioxidants which help protect cells from damage.
29. His dedication and hard work epitomized the values of the company.
30. The epidemiologist conducted a comprehensive study to determine the cause of the disease outbreak.

Answer

Multiple Choice: 1. A group of individuals with shared interests 2. The harmful effects of a substance on living organisms 3. Persisting over a long period of time 4. Brain functions like thinking and memory 5. Improving or making better 6. Rapid increase or growth 7. Careful attention to detail 8. Statistical associations between variables 9. Excessive worry and anxiety 10. Blood vessels

Gap-Fill: 11. danger 12. epigenome 13. detrimental 14. indulgent 15. homochirality 16. substantial 17. epidemiologist 18. medication 19. counteract 20. cumulative

Matching sentence: 1. Repercussions 2. Conscientiousness 3. Disorders 4. Flavanols 5. Alterations 6. Methylation 7. Cardiovascular 8. Antioxidants 9. Epitomizing 10. Epidemiologist

CATEGORY

1. Health - LEVEL5

Date Created

2024/12/04

Author

aimeeyoung99