



Safer Pregnancy Epilepsy Drug: Rapamycin Enhances Safety

Description

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A study found that combining the epilepsy medication sodium valproate with the drug rapamycin could potentially prevent developmental issues in pregnant women. Sodium valproate is commonly used to treat epilepsy, bipolar disorder, and migraines, but its use during pregnancy is discouraged due to the risk of birth defects and learning difficulties in the baby.

Researchers at the University of Queensland created mini spinal cords, known as organoids, in a lab to investigate how sodium valproate affects fetal development. When exposed to the drug, the cells in the organoids showed changes associated with congenital conditions.

The study revealed that a cell signalling pathway called mTOR was implicated in these effects, leading to cellular senescence, a process where cells stop multiplying but release inflammatory chemicals. Rapamycin, which targets the mTOR pathway, prevented this senescence when combined with sodium valproate in experiments on spinal organoids and zebrafish larvae.

While further research is needed before this combination therapy can be recommended for pregnant women taking sodium valproate, the findings offer hope for mitigating the drug's negative impact. Experts emphasize the importance of sodium valproate in treating seizures and welcome the potential for safeguarding its benefits.

Topics: Health, Pregnancy, Epilepsy Medication, Drug Combination

Vocabulary List:

1. **Epilepsy** /'ɛp.ɪ.ləp.si/ (noun): A neurological disorder characterized by recurrent seizures.
2. **Congenital** /kən'dʒɛn.ɪ.təl/ (adjective): Existing at birth; often refers to conditions present from birth.
3. **Senescence** /sɪ'nɛs.əns/ (noun): The condition or process of deterioration with age; in cells it refers to a state where they cease to divide.
4. **Inflammatory** /ɪn'flæm.ə.tɔːr.i/ (adjective): Causing or related to inflammation; often used in a medical context.
5. **Mitigating** /'mɪt.ɪ.geɪ.tɪŋ/ (verb): Make less severe serious or painful.
6. **Pathway** /'pæθ.weɪ/ (noun): A series of actions or processes that lead to a particular outcome; can refer to biological pathways in science.

Comprehension Questions

Multiple Choice

1. Which drug is commonly used to treat epilepsy, bipolar disorder, and migraines?

Option: Rapamycin



- Option: Valproate
- Option: Larvae
- Option: mTOR pathway

2. What process occurs when cells stop multiplying but release inflammatory chemicals?

- Option: Senescence
- Option: Mitosis
- Option: Apoptosis
- Option: Cytokinesis

3. What is the cell signaling pathway implicated in the effects of sodium valproate?

- Option: mTOR pathway
- Option: Rapamycin
- Option: Zebrafish larvae
- Option: Congenital conditions

4. What did researchers use to investigate how sodium valproate affects fetal development?

- Option: Spinal organoids
- Option: Rapamycin
- Option: Birth defects
- Option: Learning difficulties

5. Which drug prevented cellular senescence when combined with sodium valproate in experiments?

- Option: Rapamycin
- Option: Valproate
- Option: mTOR pathway
- Option: Congenital conditions

6. What does the study suggest about the combination therapy of sodium valproate and rapamycin?

- Option: It could potentially prevent developmental issues in pregnant women
- Option: It is not recommended for pregnant women
- Option: It has no effect on cellular senescence
- Option: It worsens the effects of sodium valproate

True-False

7. Sodium valproate is recommended to be taken during pregnancy.



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8. Rapamycin targets the mTOR pathway.
 9. The study conducted experiments on human embryos.
 10. Further research is not necessary before recommending the combination therapy to pregnant women.
 11. Sodium valproate is commonly used to treat diabetes.
 12. Cellular senescence is a process where cells continue to multiply rapidly.

Gap-Fill

13. Sodium valproate is commonly used to treat epilepsy, bipolar disorder, and _____.
14. Researchers at the University of Queensland created mini spinal cords, known as _____, in a lab to investigate how sodium valproate affects fetal development.
15. Rapamycin prevented cellular senescence when combined with sodium valproate in experiments on spinal organoids and zebrafish _____.
16. Experts emphasize the importance of sodium valproate in treating _____ and welcome the potential for safeguarding its benefits.
17. While further research is needed, the findings offer hope for mitigating the drug's negative impact during _____.
18. A cell signaling pathway called _____ was implicated in the effects of sodium valproate.

Answer

Multiple Choice: 1. Valproate 2. Senescence 3. mTOR pathway 4. Spinal organoids 5. Rapamycin 6. It could potentially prevent developmental issues in pregnant women

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

Gap-Fill: 13. migraines 14. organoids 15. larvae 16. seizures 17. pregnancy 18. mTOR



Vocabulary quizzes

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

1. Which medical condition is characterized by recurrent seizures?
Option: Inflammatory
Option: Epilepsy
Option: Senescence
Option: Congenital
2. What is a criminal activity that involves a computer and a network?
Option: Sanctions
Option: Regulatory
Option: Cybercrime
Option: Scrutiny
3. Which technology uses biological data for identification purposes?
Option: Disrupt
Option: Biometric
Option: Encryption
Option: Safeguards
4. Which area is associated with regulatory compliance and market competition?
Option: Sensory
Option: Location
Option: Business
Option: Pathway
5. Which term describes something that has been improved or modernized?
Option: Revamped
Option: Uproar
Option: Inquiries
Option: Criticism
6. Which word best describes being watchful and alert for potential danger?



- Option: Mitigating
- Option: Vigilant
- Option: Privacy
- Option: Proficient

7. What term refers to the right of an individual to keep their personal information confidential?

- Option: Privacy
- Option: Inflammatory
- Option: Safeguards
- Option: Pathway

8. Which term describes something that is tailored to individual preferences or characteristics?

- Option: Epilepsy
- Option: Personalized
- Option: Congenital
- Option: Senescence

9. Which process involves gradual development and change over time?

- Option: Evolution
- Option: Revamped
- Option: Uproar
- Option: Disrupt

10. What is a specific point or position in physical space?

- Option: Location
- Option: Capsule
- Option: Regulatory
- Option: Biometric

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

- 11. The _____ regarding data security have prompted new legislation.
- 12. Implementing _____ measures can reduce the impact of potential risks.
- 13. The company faced intense _____ following the data breach.
- 14. The heist became _____ due to its scale and audacity.
- 15. Adhering to _____ requirements is crucial for operating legally.



16. The controversial decision caused a major _____ among the community.
17. The website was _____ to improve user experience.
18. The customer service team handles various _____ from users.
19. The artist faced harsh _____ for the controversial painting.
20. Data security was enhanced through advanced _____ techniques.

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

21. Implementing strong security measures can protect against unauthorized access and data breaches.
22. Exploring various career options can help individuals find the right for their future.
23. The process of aging is often accompanied by physical and cognitive changes known as .
24. Innovative technologies have the potential to traditional industries.
25. A condition that is present at birth is referred to as a anomaly.
26. After continuous practice and training he became highly skilled and in his craft.
27. The news article contained provocative and statements that sparked controversy.
28. The time summarized the main points of the lengthy presentation.
29. Every action has its own set of whether positive or negative.
30. The gradual of technology has transformed the way we live and work.

Answer

Multiple Choice: 1. Epilepsy 2. Cybercrime 3. Biometric 4. Business 5. Revamped 6. Vigilant 7. Privacy 8. Personalized 9. Evolution 10. Location

Gap-Fill: 11. Concerns 12. Mitigating 13. Scrutiny 14. Infamous 15. Regulatory 16. Uproar 17. Revamped 18. Inquiries 19. Criticism 20. Encryption

Matching sentence: 1. Safeguards 2. Pathway 3. Senescence 4. Disrupt 5. Congenital 6. Proficient 7. Inflammatory 8. Capsule 9. Consequences 10. Evolution



CATEGORY

1. Sci/Tech - LEVEL3

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