



ScienceAlert: Unraveling the Mystery of 'Zombie Neurons' and their Role in Brain Learning

Description

Scientists studying learning processes in mice have **stumbled upon** a strange discovery: 'zombie **neurons** .' Far from being a creature from a horror movie, these are merely cells in the brain that stop functioning normally yet remain alive. This important find provides remarkable insights into the brain's learning processes.

A Portuguese team discovered these **odd** cells during research on the **cerebellum**, a crucial part of the brain that learns from our surroundings. The **cerebellum** controls **sensory** information related to motor movements, **essentially** teaching us how to refine our movements based on previous experiences.

To shed light on this process, scientists used **optogenetic** methods, a technique that manipulates cells with light. Certain parts of the **cerebellum**, namely 'climbing fibers', played a pivotal role in these experiments. "After consistently stimulating these fibers with a certain visual cue, the mice learned to blink in response to that cue. This proves the vital role these fibres play in associative learning," explained neuroscientist Tatiana Silva.

During their studies, scientists noticed the 'zombie neuron' effect. While the introduction of a light-sensitive protein continued to keep these cells active, they failed to relay messages, essentially disabling the mice's ability to learn. "Introducing the protein altered the fiber's natural ability to respond appropriately to **sensory stimuli** such as air puffs, preventing the mice from learning," observed another neuroscientist, Megan Carey.

In conclusion, the 'zombie neuron' phenomenon gives scientists a much clearer picture of learning processes within the **cerebellum** of mice, which is highly comparable to humans. The scientific community continues to be **intrigued** by the complexities of the brain, the evolving understanding of which leads to better protection and care for it.

Vocabulary Insights:

- **Stumbled upon** /st?mb?ld ??p?n/ (phrase): Accidentally encountered or discovered something unexpected.
- **Neuron** /?nj??r?n/ (noun): A specialized cell transmitting nerve impulses; a nerve cell.
- **Odd** /?d/ (adj.): Different from what is usual or expected; strange.
- **Cerebellum** /?s?r??b?l?m/ (noun): A part of the brain at the back of the skull in vertebrates, which coordinates and regulates muscular activity.
- **Sensory** /?s?ns?ri/ (adj.): Relating to sensation or the physical senses; transmitted or perceived by the senses.
- **Essentially** /??s?n??li/ (adv.): Used to emphasize the basic, fundamental, or intrinsic nature of a person, thing, or situation.
- **Optogenetic** /??pt??d??n?t?k/ (adj.): Relating to or using optogenetics, a technique for controlling the activity of neurons with light.



- **Stimuli** /?st?mj?la?/ (noun plural): Things that rouse activity or energy in someone or something; a thing or event that evokes a specific functional reaction in an organ or tissue.
- **Intrigued** /?n?tri??d/ (adj.): Aroused the curiosity or interest of; fascinated.

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Vocabulary List:

1. **Accidentally** // (adverb): Happening by chance unintentionally or unexpectedly.
2. **Specialized** // (adjective): Designed trained or developed for a particular purpose or area of knowledge.
3. **Functioning** // (noun): The proper operation or working of something.
4. **Responsible** // (adjective): Having an obligation to do something or having control or authority over someone or something.
5. **Role** // (noun): The function assumed or part played by a person or thing in a particular situation.
6. **Manipulates** // (verb): To handle control or influence a person or situation skillfully.

Vocabulary quizzes



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

1. Which of the following is commonly known as pink eye?
Option: Antiviral
Option: Pathogenic
Option: Conjunctivitis
Option: Transmissions
2. Which word means astonishing or deeply shocking?
Option: Accidentally
Option: Staggering
Option: Specialized
Option: Functioning
3. What term is used to describe a marked change in form nature or appearance?
Option: Responsible
Option: Role
Option: Manipulates
Option: Transformation
4. Which term refers to the condition of being physically fit and healthy?
Option: Transformation
Option: Fatigue
Option: Negligence
Option: Fitness
5. What is a relatively flat and high land area?
Option: Fitness
Option: Plateau
Option: Nutritionist
Option: Rekindling
6. Which term describes a species that is likely to harm the environment it is introduced into?
Option: Undisclosed
Option: Refrain
Option: Invasive
Option: Frivolously
7. What is an organism that transmits a pathogen to another organism known as?
Option: Enthralled
Option: Acquiring
Option: Invasive



Option: Vector

8. Which term refers to the monitoring of behavior activities or information for the purpose of gathering information?

Option: Transmission

Option: Flourishes

Option: Infestation

Option: Surveillance

9. What is the failure to take proper care in doing something?

Option: Transmission

Option: Negligence

Option: Rekindling

Option: Undisclosed

10. Which term means to buy or obtain an object or asset?

Option: Frivolously

Option: Enthralled

Option: Acquiring

Option: Invasive

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

11. _____ microorganisms can cause disease in their host.

12. The machine stopped _____ after years of reliable operation.

13. In the play her _____ was to portray the antagonist.

14. In a suitable environment this plant _____ and grows rapidly.

15. Without proper pest control the house had an _____ of ants.

16. The surgeon performed the _____ procedure with precision.

17. Please _____ from using your phone during the meeting.

18. The audience was _____ by the magician's performance.

19. The company had an _____ agreement with its partners.



20. The dictator _____ the media to control public opinion.

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

21. After a long day at work he felt extreme tiredness and lack of energy.
22. The couple went on a romantic getaway in hopes of reviving their relationship.
23. She consulted a professional to create a balanced diet plan tailored to her needs.
24. Medication that inhibits the growth and spread of viruses in the body.
25. Being answerable and accountable for one's actions or duties.
26. The species evolved to survive in the changing environmental conditions.
27. He knocked over the vase while cleaning the table.
28. The authorities used advanced technology for constant monitoring of the city.
29. The accident could have been prevented if not for his lack of care.
30. Regular exercise and a balanced diet are essential for good health and .

Answer

Multiple Choice: 1. Conjunctivitis 2. Staggering 3. Transformation 4. Fitness 5. Plateau 6. Invasive 7. Vector 8. Surveillance 9. Negligence 10. Acquiring

Gap-Fill: 11. Pathogenic 12. Functioning 13. Role 14. Flourishes 15. Infestation 16. Specialized 17. Refrain 18. Enthralled 19. Undisclosed 20. Manipulates

Matching sentence: 1. Fatigue 2. Rekindling 3. Nutritionist 4. Antiviral 5. Responsible 6. Adapting 7. Accidentally 8. Surveillance 9. Negligence 10. Fitness

CATEGORY

- 1. Health - LEVEL4

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