



Physicists Uncover Slime Mould's Decision Process

Description

Slime molds are unusual, slippery creatures. They aren't true molds or fungi. They live as either plasmodia or amoebae, not following the usual rules of other life forms.

Despite not having a brain or nervous system, slime molds show behavior that seems intelligent. But what makes them move together in a coordinated way? A new study gives some answers.

The most famous slime mold is *Physarum polycephalum*, a bright yellow organism often used in experiments. As a plasmodium, it's mostly a big bag of cell nuclei and goo. Its flexible body allows it to move easily, unlike fungi.

When food runs out, *P. polycephalum* can move to find more. Surprisingly, they can solve mazes to get food and remember the way. Scientists in Germany and the US are learning how these molds make decisions without a central brain.

Slime molds dislike blue light, so researchers can trap them with barriers made of this light. However, if they're hungry, they try to escape, sending out small protrusions to find a way through.

These molds move by rhythmic contractions, not nerves, which helps them adjust to their environment. In experiments, when faced with barriers, they explore and eventually escape by finding the longest path out. This movement seems like decision-making, but it relies on mechanical processes of fluid movement.

The study helps us understand how non-brain organisms adapt and behave using decentralized systems. The research was published in *PRX Life*.

Vocabulary List:

1. **coordinated** //koo'ɔrdə,neɪtɪd// (adjective): acting together in an organized, planned way
2. **plasmodium** //plæz'moʊdiəm// (noun): a large soft mass of cells
3. **protrusions** //prə'tru:zənz// (noun): small parts that stick out from something
4. **contractions** //kən'trækʃənz// (noun): short, strong movements of muscles or parts
5. **decentralized** //di:'sentrə,laɪzd// (adjective): not controlled by one central place or part
6. **barriers** //'bæriəz// (noun): things that block movement or passage

Comprehension Questions



Multiple Choice

1. What is the most famous slime mold?
Option: Amoeba proteus
Option: Physarum polycephalum
Option: Fusarium oxysporum
Option: Rhizopus stolonifer

2. What color light do slime molds dislike?
Option: Red
Option: Green
Option: Blue
Option: Yellow

3. What type of movement do slime molds use to move?
Option: Nerve impulses
Option: Rhythmic contractions
Option: Flagella
Option: Cilia

4. What happens when food runs out for slime molds?
Option: They stop moving
Option: They can move to find more
Option: They become dormant
Option: They reproduce

5. Who conducted research on slime molds' decision-making?
Option: Scientists in Japan
Option: Scientists in Germany and the US
Option: Scientists in Australia
Option: Scientists in UK

6. What is primarily found in a plasmodium of slime mold?
Option: Mycelium
Option: Cell nuclei and goo
Option: Chloroplasts
Option: Hyphae



True-False

7. Slime molds are true molds and belong to the fungi kingdom.
8. Slime molds can solve mazes to find food.
9. Slime molds have a brain and a nervous system.
10. The study of slime molds was published in PRX Life.
11. Slime molds can only move in straight lines.
12. Researchers can trap slime molds using blue light barriers.

Gap-Fill

13. Slime molds are unusual, slippery creatures that live as either plasmodia or _____.
14. The flexible body of slime molds allows them to move _____.
15. When hungry, slime molds send out small protrusions to find a way _____.
16. Slime molds adapt and behave using _____ systems.
17. The most famous slime mold is _____ polycephalum.
18. Slime molds explore to escape barriers by finding the _____ path out.

Answer

Multiple Choice: 1. Physarum polycephalum 2. Blue 3. Rhythmic contractions 4. They can move to find more
5. Scientists in Germany and the US 6. Cell nuclei and goo

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

Gap-Fill: 13. amoebae 14. easily 15. through 16. decentralized 17. Physarum 18. longest

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. Decision Making
3. ESL learning
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6. Level 3
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