

Bacteria pass 'memories' to future generations

27th November 2023



Just when scientists thought they knew all there was to know about bacteria, they have unearthed something quite unexpected. They have found that bacteria have a mechanism within their single-celled forms that can store and pass on memories to future generations. The research was on the ubiquitous *E. coli* bacterium. This is one of Earth's most well-studied organisms. Researchers at the University of Texas wrote about how bacteria could form memories while lacking a brain: "Bacteria don't have brains, but they can gather information from their environment, and if they have encountered that environment frequently, they can store it and quickly access it later for their benefit."

Bacterial memory differs from that in humans. It may be more akin to our muscle memory. Our bodily tissue has a sense of what to do next from having done it repetitively many times before. The researchers attributed bacterial memory to levels of iron in their physical constitution. A researcher said: "Before there was oxygen in the Earth's atmosphere, early life was utilizing iron for a lot of cellular processes." He added: "Iron is not only critical in the origin of life on Earth, but also in the evolution of life. It makes sense that cells would utilize it." He said his research could aid in combating bacterial diseases, as "the more we know about bacterial behaviour, the easier it is to combat them".

Sources: earth.com / unilad.com / sciencealert.com

Writing

Memories are the most important things we have. Discuss.

Chat

Talk about these words from the article.

scientists / bacteria / mechanism / single-celled forms / research / memories / brain / humans / muscle / sense / iron / physical / constitution / oxygen / Earth / diseases

True / False

- 1) Scientists actually know everything there is to know about bacteria. T / F
- 2) The most well-studied bacteria on Earth are *E. coli*. T / F
- 3) The researchers said some cells may have a brain. T / F
- 4) Bacteria can gather information about their environment. T / F
- 5) Bacteria memory could be similar to muscle memory in humans. T / F
- 6) Early bacteria relied on iron to develop and survive. T / F
- 7) Iron was important is the beginnings of life on Earth. T / F
- 8) A researcher said his research would end all diseases. T / F

Synonym Match

(The words in **bold** are from the news article.)

- | | |
|-----------------------|------------------|
| 1. unearthed | a. similar |
| 2. unexpected | b. being without |
| 3. ubiquitous | c. experienced |
| 4. lacking | d. development |
| 5. encountered | e. unpredicted |
| 6. differs | f. credited |
| 7. akin | g. discovered |
| 8. attributed | h. fight |
| 9. evolution | i. varies |
| 10. combat | j. ever-present |

Discussion – Student A

- a) What do you know about bacteria?
- b) What can we do to keep harmful bacteria away?
- c) What do you think of bacteria having a form of memory?
- d) What is the purpose of bacteria?
- e) What memories do you think bacteria might pass on?
- f) What are your earliest memories?
- g) What memories do you want to pass on to future generations?
- h) How good is your memory?

Phrase Match

- | | |
|---|------------------------------|
| 1. they knew all | a. akin to our muscle memory |
| 2. they have unearthed something | b. E. coli bacterium |
| 3. The research was on the ubiquitous | c. access it later |
| 4. bacteria could form memories while | d. of life |
| 5. they can store it and quickly | e. the Earth's atmosphere |
| 6. Bacterial memory differs from | f. quite unexpected |
| 7. It may be more | g. that in humans |
| 8. Before there was oxygen in | h. lacking a brain |
| 9. in the evolution | i. bacterial diseases |
| 10. He said his research could aid in combating | j. there was to know |

Discussion – Student B

- What do you think about what you read?
- What do you know about muscle memory?
- How powerful is our memory?
- What do you know about the origins of life on Earth?
- What can we do to improve our memory?
- What are your best memories?
- What would you like to know about bacteria?
- What questions would you like to ask the researchers?

Spelling

- unearthed something quite unexpected
- bacteria have a emihancsm
- their single-dleelc forms
- the uitouiqsbu E. coli bacterium
- Earth's most well-studied rsoiamsgn
- information from their nnmroeivetn
- more ikan to our muscle memory
- done it reeiltepyivt
- tidrtbutae bacterial memory to levels of iron
- in their physical stuniinoctot
- a lot of llarelcu processes
- in the loeuivtn of life

Answers – Synonym Match

1. g	2. e	3. j	4. b	5. c
6. i	7. a	8. f	9. d	10. h

Role Play

Role A – Property

You think property is the most important thing to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): money, stories or cleaner cities.

Role B – Money

You think money is the most important thing to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): property, stories or cleaner cities.

Role C – Stories

You think stories are the most important things to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): money, property or cleaner cities.

Role D – Cleaner Cities

You think cleaner cities are the most important things to pass on to future generations. Tell the others three reasons why. Tell them why their things aren't as important. Also, tell the others which is the least important of these (and why): money, stories or property.

Speaking – Passing On

Rank these with your partner. Put the most important things to pass on to future generations at the top. Change partners often and share your rankings.

- | | |
|------------|------------------|
| • Memories | • Jewellery |
| • Property | • Stories |
| • Photos | • Knowledge |
| • Money | • Cleaner cities |

Answers – True False

1 F	2 F	3 F	4 T	5 T	6 T	7 T	8 F
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Answers to Phrase Match and Spelling are in the text.