



Artemis II Aims to Uncover Space Travel Hazards

Description

Before four astronauts embarked on their Artemis II mission to the moon, each of them carried a small piece of themselves aboard. Incubated in a compact triangular container, four USB-size “avatars” accompanied the crew on this significant journey. However, their exploration is merely starting.

These avatars, termed organ chips, consist of bone marrow tissue created from cells donated by the astronauts—NASA’s Reid Wiseman, Victor Glover, Christina Koch, and Canadian astronaut Jeremy Hansen. Researchers advocate that this experiment could provide unprecedented insights into the effects of space travel on human health.

The AVATAR (A Virtual Astronaut Tissue Analog Response) study enables scientists to simulate the impact on astronauts' organs during deep space flights. This methodology offers a finer analysis of bodily changes compared to traditional post-flight medical assessments, as highlighted by Lisa Carnell, Director of NASA’s Biological and Physical Sciences Division.

Focusing on bone marrow allows researchers to examine the crew's immune responses to the challenges of deep space, including increased radiation exposure. Such findings may lead to personalised treatments, facilitating longer missions further into space.

Carnell stated that different astronauts may exhibit varying responses to space radiation, implying the potential need for tailored medical kits. The objective is to prepare astronauts for longer durations in space, ensuring their health and wellbeing.

Carnell further expressed a desire to send avatars of astronauts selected for extended missions before their actual launches, to anticipate any health issues that might arise far from Earth. As the AVATAR project unfolds, the Artemis II crew is also working on collecting essential data throughout their mission, which continues post-return to Earth.

Vocabulary List:

1. **avatars** //ˈævə,tɑːz// (noun): small figures or images that represent people
2. **incubated** //ˈɪŋkjə,betɪd// (verb): kept warm to help something grow
3. **simulate** //ˈsɪmjə,leɪt// (verb): to copy or make like the real thing
4. **unprecedented** //ʌnˈprɛsɪdɪntɪd// (adjective): never happened before, very new or different
5. **methodology** //ˌmɛθəˈdɒlədʒi// (noun): the methods used to do a study
6. **radiation** //ˌreɪdiˈeɪʃən// (noun): energy that comes from space or other sources



Comprehension Questions

Multiple Choice

1. What is the main purpose of the avatars carried by the astronauts on the Artemis II mission?
Option: To entertain the crew
Option: To provide insights into human health during space travel
Option: To serve as communication devices
Option: To replace human organs
2. What does AVATAR stand for?
Option: Astronaut Vital And Tissue Assessment Report
Option: A Virtual Astronaut Tissue Analog Response
Option: Astrophysical Validation and Technology Assessment Research
Option: Aero-Vehicle Astronaut Tissue Analysis Record
3. Which astronauts are mentioned as part of the Artemis II crew?
Option: Reid Wiseman, Victor Glover, Christina Koch, and Jeremy Hansen
Option: Neil Armstrong, Buzz Aldrin, Michael Collins, and Sally Ride
Option: John Glenn, Alan Shepard, Mae Jemison, and Peggy Whitson
Option: Charles Duke, Jack Swigert, Fred Haise, and Ken Mattingly
4. What specifically do the organ chips consist of?
Option: Blood cells
Option: Bone marrow tissue
Option: Skin samples
Option: Muscle tissue
5. Who is the Director of NASA's Biological and Physical Sciences Division mentioned in the text?
Option: Reid Wiseman
Option: Victor Glover
Option: Lisa Carnell
Option: Christina Koch
6. What is one potential application of the findings from this study?
Option: Creating spacecrafts



- Option: Personalized medical treatments for astronauts
- Option: Developing new food for astronauts
- Option: Improving space suits

True-False

7. The avatars are used to replace the astronauts during their mission.
8. The AVATAR study allows for simulation of bodily changes before astronauts go to space.
9. Different astronauts may respond similarly to space radiation.
10. NASA aims to prepare astronauts for longer missions with tailored medical kits.
11. The Artemis II crew's mission data collection ends upon their return to Earth.
12. The organ chips can help assess immune responses in deep space.

Gap-Fill

13. Before embarking on their Artemis II mission, astronauts carried avatars in a _____ container.
14. The organ chips are made from _____ marrow tissue.
15. The objective of the AVATAR project is to prepare astronauts for longer _____ in space.
16. NASA's study may lead to personalized _____ for astronauts.
17. Astronauts selected for extended missions may have their avatars sent before their _____.
18. The AVATAR study allows for a more detailed analysis of bodily _____ in space.



Answer

Multiple Choice: 1. To provide insights into human health during space travel 2. A Virtual Astronaut Tissue Analog Response 3. Reid Wiseman, Victor Glover, Christina Koch, and Jeremy Hansen 4. Bone marrow tissue 5. Lisa Carnell 6. Personalized medical treatments for astronauts

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

Gap-Fill: 13. triangular 14. bone 15. durations 16. treatments 17. launches 18. changes

Vocabulary quizzes

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

1. What term refers to a lack of compatibility or similarity between two or more facts?

Option: Concurrence

Option: Discrepancy

Option: Similarity

Option: Uniformity

2. Which of the following best defines the term 'viability'?

Option: Possibility of success

Option: Impossibility of failure

Option: Likelihood of loss

Option: Uncertainty in action

3. Which word best describes a situation that has never occurred before?

Option: Usual

Option: Common

Option: Unprecedented

Option: Routine

4. In research, what does the term 'methodology' refer to?

Option: Branch of science

Option: Systematic approach to research

Option: Type of experiment

Option: Research outcome

5. Which term describes the imitation of a real-world process or system?

Option: Emulation

Option: Simulation

Option: Realization



Option: Actualization

6. What is the term for digital representations of users in virtual environments?

Option: Icons

Option: Avatars

Option: Figures

Option: Representations

7. Which word refers to a piece of software designed to update or fix issues in a program?

Option: Patch

Option: Update

Option: Install

Option: Version

8. What is the process by which energy travels through space called?

Option: Conduction

Option: Convection

Option: Radiation

Option: Transmission

9. Which term describes something custom-made to suit a specific need?

Option: Standard

Option: Generic

Option: Tailored

Option: Uniform

10. What does it mean to determine the accuracy of something?

Option: Speculate

Option: Ascertain

Option: Assume

Option: Guess

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

11. Deuterium is an isotope of hydrogen that contains one proton and one _____.

12. The research team conducted a _____ study to assess the potential impacts before the main experiment.

13. The technician needed to _____ the results to verify their accuracy.



14. The project was completed ahead of the _____ deadline.
15. The _____ of technology has significantly improved communication methods.
16. From the data collected, the researcher _____ the existence of a new trend.
17. The filmmaker received multiple _____ for her outstanding work in the industry.
18. The athlete proved to be a strong _____ for the championship title.
19. The article discussed _____ aspects of storytelling rather than just the plot.
20. The changes made to the policy will be _____ and effective immediately.

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

21. The scientist provided unequivocal evidence to support the new theory.
22. The findings necessitate a reevaluation of the existing model.
23. The subsequent findings confirmed the initial hypotheses.
24. The samples were incubated at controlled temperatures to promote growth.
25. The documentary presented a compelling narrative of the historical events.
26. Effective communication is integral to successful collaboration among teams.
27. The research garnered significant attention from the academic community.
28. The training involved a simulation to enhance decision-making skills.
29. The critique focused on the meta aspects of the artwork, analyzing its themes and context.
30. There was a noticeable discrepancy between the reported results and the actual data.

Answer

Multiple Choice: 1. Discrepancy 2. Possibility of success 3. Unprecedented 4. Systematic approach to research 5. Simulation 6. Avatars 7. Patch 8. Radiation 9. Tailored 10. Ascertain

Gap-Fill: 11. neutron 12. preliminary 13. duplicate 14. anticipated 15. progression 16. inferred 17. accolades 18. contender



19. meta 20. permanent

Matching sentence: 1. unequivocal 2. necessitate 3. subsequent 4. incubated 5. narrative 6. integral 7. garnered 8. simulation 9. meta 10. discrepancy

CATEGORY

1. Sci/Tech - LEVEL6

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1. Artemis II
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5. Level 6
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Date Created

2026/04/10

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