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CER- Would You Go To Mars?

**Tests show that radiation from a Mars mission could lead to brain damage**By PBS NewsHour, adapted by Newsela staff

(1) Radiation exposure on a deep space journey to Mars could cause long-term brain damage, according to recent findings from the University of California-Irvine School of Medicine.
(2) Radiation from space constantly bombards Earth, but our planet’s magnetic field deflects the worst rays of energy. The same rule does not apply to Mars, but too few astronauts have been exposed to lengthy bouts of space radiation on moon trips for an in-depth brain study. The closest examples on Earth come from cancer treatments and nuclear bomb patients, both of which have higher concentrated amounts of radiation than one would find in deep space. Intentional human studies of the consequences are impossible — I mean, would you want to volunteer? Animal models represent one of the only ways to address how a constant lower dose of radiation over a long period could impact the brain.
(3) This study began at the NASA Space Radiation Laboratory in New York. Scientists exposed mice and rats to radioactive isotopes of titanium and oxygen, which are both found in rays from space. Once complete, this team sent their specimens to radiation oncologist Charles Limoli at the University of California-Irvine School of Medicine.

**Bad News For Brain Cells**(4) Within six months, they found brain swelling and permanent damage to communication networks between brain cells. The rats and mice lost their ability to master easy tasks, pointing toward damages in their learning and memory abilities. The researchers called this impact to the central nervous system “space brain.”
(5) “This is not positive news for astronauts deployed on a two-to-three-year round trip to Mars,” Limoli said of his October 10 study in Scientific Reports. Limoli said that many of these brain problems could worsen throughout one's life.

**Radiation Interferes With Fear Extinction**
(6) The radiation also affected a process called “fear extinction.” When you undergo a terrifying experience like drowning, you develop a fear related to that experience, such as a fear of water. With gradual exposure to that fear-inducing experience — spending time around or in water after near drowning — you become accustomed to the activity again, and the fear begins to dissipate.
(7) When the brains of the rats and mice encounter space radiation, Limoli said that “fear extinction” stops occurring. This pattern could lead to higher levels of anxiety, impaired decision-making and depression if the same trends hold in humans.

**Upside Is Improved Cancer Radiation Treatments**
(8) Lawrence Townsend is a nuclear engineer and former NASA researcher. He was not involved in this study, but he said this research reveals more specifics on the potential impact of space-level radiation on the human brain.
(9) Townsend said we have seen brain damage in those who have received radiation therapy for cancer and in survivors of the atomic bombs dropped on Japan in World War II. “However, these exposures were from radiations that differ significantly in quality from those found in space,” he said.
(10) While human travel to Mars is years away, Limoli said this research could improve radiation treatments for cancer, by describing the long-term neurological side effects

**Claim:**Make a claim as to whether or not you would go to Mars.

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**Evidence:**Provide at least three pieces of specific evidence to support your claim.  (At least one should come from the article above)

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**Reasoning:**Explain why you would or would not travel to Mars.

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 **Putting it all together**: Write a well-written paragraph to make the claim, give the evidence, and explain the reasoning. Include an introduction, body, and conclusion. Use complete sentences, proper punctuation, and capitalization.

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