

Nanobacteria: Astronauts at Highest Risk During Space Missions

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NASA researchers announce a potential cause of rapid kidney stone formation in astronauts on space travels. The authors of a study published in *Kidney International* call for a "Major Initiative" to investigate nanobacteria.

Nanobacteria (NB), a novel self-replicating, mineralizing agent, has been identified by National Aeronautics and Space Administration (NASA) scientists as a potential culprit in kidney stone formation among astronauts. With the potential for future exploratory space missions to the moon and Mars, longer missions, and exposure to the elements of outer space, health is a major concern for astronauts.

To further comprehend the implications of NB, trials were conducted at NASA to examine NB, in a bioreactor chamber which simulates conditions of space travel. In this microgravity environment, NB was found to multiply five times faster compared to normal gravity on Earth, supporting earlier discoveries that microbes have radically different behavior in weightless environments. NB is also shown to possibly be an infectious risk for crew members living in close quarters.

"The concept that nanobacteria are living organisms is still controversial because the research on their putative nucleic acid has not been completed yet," states lead researcher Neva Ciftcioglu, Ph.D. However, the group's research provides additional clues to understanding NB and its link to pathologic calcification-related diseases.

"Hopefully, eradication or treatment of these diseases will be possible in

the near future. We need more research and support to solve this puzzle, but we feel that we are close," adds Ciftcioglu.

NB was discovered in the 1990s and has been found in the calcium phosphate centers of kidney stones. This novel agent has also been detected in related conditions, including Alzheimer's disease, heart disease, prostatitis, and some cancers. Further testing for the presence of NB in human bodies can help reduce the risk for kidney stone formation in astronauts and would also be of benefit to the nearly one million Americans who are treated for kidney stones each year.

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