

SOUTHWESTERN NEWS

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UT Southwestern gets NASA grant to study human cells' response to radiation

DALLAS – July 27, 2005 – A team of researchers at UT Southwestern Medical Center has embarked on a four-year research mission funded by a \$1.2 million grant from NASA to explore the damage to human DNA caused by radiation that penetrates hulls of spacecrafts and space stations.

Led by principal investigator Dr. Sandeep Burma, assistant professor of radiation oncology, the UT Southwestern team will study how human cells respond to ionizing radiation, which is composed of particles that have sufficient energy to damage components of living cells, especially their DNA, hampering the cells' abilities to repair themselves and reproduce. If such DNA damage is not fixed properly by the cell, it may lead to cancer.

“NASA would like to know if damage caused by radiation in outer space is far more dangerous than that caused by terrestrial radiation such as X-rays,” said Dr. Burma, a molecular biologist.

Dr. Burma's research project has become more relevant as NASA astronauts and crews on the International Space Station are spending more time subjected to space radiation than previous generations of astronauts and cosmonauts.

Scientists have long known that space radiation passing through the outer shielding of spacecraft – mostly a specially engineered aluminum – can fragment into other forms of radiation thereby increasing the complexity and, perhaps, the injuriousness of the radiation field inside.

The findings will have implications for the shielding material NASA uses for the outer hull of spacecrafts and for the safety design of spacesuits. Dr. Burma said he also hopes the results may shed light on exactly how human cells respond to the complex DNA damage caused by space radiation that has passed through shielding material, especially on long-term missions.

In his research project, Dr. Burma will take advantage of the capabilities of the booster

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accelerator at the NASA Space Radiation Laboratory in the Brookhaven National Laboratory in Upton, N.Y. Beams of heavy ions generated at the accelerator will be shot at human cells growing in flasks and will help researchers simulate and measure the direct effects of outer-space radiation compared with that of space radiation that has passed through the shielding material of spacecraft.

Dr. Burma's grant was part of \$19 million NASA awarded in June to 21 space radiation research projects and the only one awarded to an academic institution in Texas.

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