

# NASA preps for space-based stem cell research

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NASA and the Center for the Advancement of Science in Space (CASIS) are enabling research aboard the International Space Station that could lead to new stem cell-based therapies for medical conditions faced on Earth and in space.

Scientists will take advantage of the space station's [microgravity environment](#) to study the properties of non-embryonic stem cells.

NASA is interested in space-based cell research because it is seeking ways to combat the [negative health effects](#) astronauts face in microgravity, including bone loss and [muscle atrophy](#). Mitigation techniques are necessary to allow humans to push the boundaries of [space exploration](#) far into the solar system. This knowledge could help people on Earth, particularly the elderly, who are afflicted with similar conditions.

Two stem cell investigations scheduled to fly to the [space station](#) next year were highlighted Friday, Dec. 6, at the World Stem Cell Summit in San Diego. Lee Hood, a member of the CASIS Board of Directors, moderated a panel session in which scientists Mary Kearns-Jonker of Loma Linda University in California and Roland Kaunas of Texas A&M University discussed their planned research, which will gauge the impact of microgravity on fundamental stem cell properties.

Kearns-Jonker's research will study the aging of neonatal and adult cardiac stem cells in microgravity with the ultimate goal of improving cardiac cell therapy. Kaunas is a part of a team of researchers developing a system for co-culturing and analyzing stem cells mixed with bone tumor cells in microgravity. This system will allow researchers to identify potential molecular targets for drugs specific to certain types of cancer.

Stem cells are cells that have not yet become specialized in their functions. They display a remarkable ability to give rise to a spectrum of cell

types and ensure life-long tissue rejuvenation and regeneration. Experiments on Earth and in space have shown that microgravity induces changes in the way stem cells grow, divide and specialize. Stem cell biology in microgravity could inform fields ranging from discovery science to tissue engineering to regenerative medicine.

NASA selected CASIS to maximize use of the International Space Station's U.S. National Laboratory through 2020. CASIS is dedicated to supporting and accelerating innovations and new discoveries that will enhance the health and wellbeing of people and our planet.

Provided by NASA

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