

Mayo Clinic News Network

Title: The countdown is on: Stem cells head to space / Date: February 2017

Intro: Stem cell research is about to get a boost that's out of this world. There will be something extra in the payload of the February SpaceX CRS-10 mission resupplying the International Space Station.

After two years of planning and preparation, and the assistance of NASA, Mayo Clinic stem cell biologist Abba Zubair, M.D., Ph.D., is finally getting his quest for answers into orbit. "So we know stem cells grow differently using simulated microgravity," says Dr. Zubair. "Primarily, our focus is to see if microgravity actually can help stem cells to expand faster, so that we can grow more of them to bring back to use for human application." Here's Dennis Douda for the Mayo Clinic News Network.

Video

Audio

Total running time [3:02]	/// VIDEO
Dennis Douda speaking	In Mayo Clinic's cell therapy laboratory in Jacksonville, Florida, Dr. Abba Zubair and a dedicated team strive to achieve some very lofty goals: to harness the power of stem cells to fight cancer, prevent organ transplant rejection, repair the damage caused by stroke and more. And yet, as a boy in Africa, Dr. Zubair had set his sights even higher: space.
TITLE: Dr. Abba Zubair, M.D., Ph.D. Mayo Clinic Laboratory Medicine and Pathology	"I really wanted to be an astronaut. Our career guidance adviser looked at me and said, 'Abba, you can do anything you want. But, before Nigeria starts sending rockets, it may not be in your lifetime.'"
Dennis Douda speaking	If not space, he decided he would explore ways to fight disease. And that led to his fascination with variations of the stem cell.
Dr. Abba Zubair speaking	"It has the ability to self-renew itself for the life of the organism."
Dennis Douda speaking	The cells also have the ability to differentiate into virtually every type of tissue, which is why doctors are using patients' own stem to heal bones, and nerves and hearts. The challenge is growing enough of them fast enough for the demands of therapies and research.
Dr. Abba Zubair speaking	"For some types of stem cells, microgravity actually induces them to grow faster."
Dennis Douda speaking	Microgravity, as in space. Parabolic flights of aircraft can simulate weightlessness, but only for very short periods.

TITLE: Courtesy: NASA/Kennedy Space Center	“Main engines up and running and liftoff of the Falcon 9 to the Space Station.”
Dennis Douda speaking	But Dr. Zubair will expose stem cells to microgravity for a full month. The cells will be cultured on the International Space Station in an automated bioreactor holding multiple incubator cassettes. Considering that fluids don’t mix well in the weightlessness of space, it’s no simple task.
Dr. Abba Zubair speaking	“The cassette is specially designed to allow mixing of reagent and fluids, and it has multiple ports. It’s specialized in such a way that the cells can be fed.”
Dennis Douda speaking	The entire experimental container is only about the size of a suitcase. Interestingly, finding ways to kill cells is also a key objective. Dr. Zubair says, because chemotherapy may be the most toxic while cancer stem cells are dividing, they are one of the three cell types he’s eager to launch into microgravity.
Dr. Abba Zubair speaking	“It can induce cancer stem cells to divide. That makes them susceptible to the chemotherapy.”
Dennis Douda speaking	As for that boyhood dream of visiting the space lab personally, it’s still flying high.
Dr. Abba Zubair speaking	“I applied to be an astronaut for the class of 2017, so you never know. Yeah.”
Dennis Douda speaking	For the Mayo Clinic News Network, I’m Dennis Douda.

Anchor tag: Dr. Zubair says he can imagine a not-so-distant future where stem cells are continuously grown in a space station, or even satellites, and shuttled back to Earth to treat patients.