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Pitt to advance medical research in space

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The University of Pittsburgh's McGowan Institute of Regenerative Medicine wants to know if research on spacecraft in low Earth orbit can help develop medical technologies.

The institute will get a chance to explore that question with its recently announced partnership with the International Space Station U.S. National Laboratory.

Bill Wagner, director of the McGowan Institute, said the partnership aims to identify "areas of promise" and move them toward strategic commercialization plans.

Research will focus on what areas of medicine could be improved in a microgravity setting, or the nearly zero-gravity experience astronauts can achieve while still in earth's gravitational pull about 200 miles up.

In a microgravity environment, stem cells divide and behave differently than on earth. Wagner said the cells remain more "stem-like" for longer periods of time, allowing for time to reproduce them. He said, in some cases, stem cells grown in microgravity proved more effective against certain conditions like traumatic brain injury.



NASA

The International Space Station U.S. National Laboratory partnered with the University of Pittsburgh's McGowan Institute of Regenerative Medicine to explore the use of microgravity in medical research.

Printing 3D fluids may prove another area of medicine that microgravity could progress. While 3D printed liquids on Earth collapse as soon as they are printed, microgravity could allow for the fluids to remain in the form and location they are printed in. Wagner said this could be useful for creating delicate structures used to print complex tissues.

Lastly, Wagner mentioned the research involving “organ on a chip.” These are small devices that pass fluid over bits of tissue grown on chips, and researchers have discovered that exposing the chips to microgravity sometimes leads to the development of conditions similar to diseases on Earth. The thinking goes that researchers can do testing for diseases not readily reproduceable on Earth.

Wagner said none of these research topics have well-developed business models yet, and the partnership aims to figure out what areas of medical research could prove worth the high cost of going into space.

The current agreement is to build a strategic plan and lead a consortium made of up of other university centers and government agencies that would eventually fund and support projects. The institute will develop facilities on the Pitt campus to advance research and meet with potential partners.

“There is only one international space station,” Wagner said. “So in this topical area this is an important consortium, because it is asking these fundamental questions of what is the role for low Earth orbit in developing technology, and Pittsburgh will be in the center of that.”

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