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XENOBOTS APPLICATIONS FOR SPACEFLIGHT

Abstract

In recent years, scientists have made significant revelations in researching and discovering new applications of nanoparticles due to their unique properties. Although many nanotechnology projects are still in the research and development phase, significant advances are being made continuously and it is important to continue this research, as it could provide significant value to the space exploration sector.

As part of recent developments, scientists have been able to combine Artificial Intelligence and biology to create Xenobots, the living nano-robots. Comprised of 500-1000 living cells and measuring less than just 1mm wide, Xenobots were created by scientists using stem cells harvested from the African clawed frog. The skin cells were used to develop the Xenobots complex architecture, while the heart cells were used for their ability to compress and contract so they can help Xenobots to propel themselves in linear or circular directions, as well as join together to act collectively and move small objects. Furthermore, the most recent studies about Xenobots capabilities have revealed that they can reproduce by self-replicating themselves. It was found that Xenobots can use frog stem cells to assemble other Xenobots just like themselves, sustaining this process for several generations.

Scientists believe that there are endless possibilities to Xenobots from advances in biology and medicine, to Artificial Intelligence and robotics. One of the most notable applications of Xenobots that scientists are currently studying would be in medicine, such as early cancer detection and precise drug delivery inside the body. Better understanding Xenobots may open the door to tissue repair and regenerative medicine. Xenobot applications can also prove to be very valuable in space exploration. Having a system that could be programmed to operate on its own and replicate itself has enormous potential for long-term human spaceflight. Additionally, scientists are investigating different ways how layers of bio-nano robots could be used in spacesuits. For example, a spacesuit could include an outer layer of Xenobots which would respond to outside elements from damages in spacesuit, and it could include an inner layer of Xenobots which could act as indicators if astronaut is in trouble or even deliver the medicine to heal the wound. Understanding better how Xenobots can operate in microgravity and how to program them could be of tremendous value to the space exploration sector.