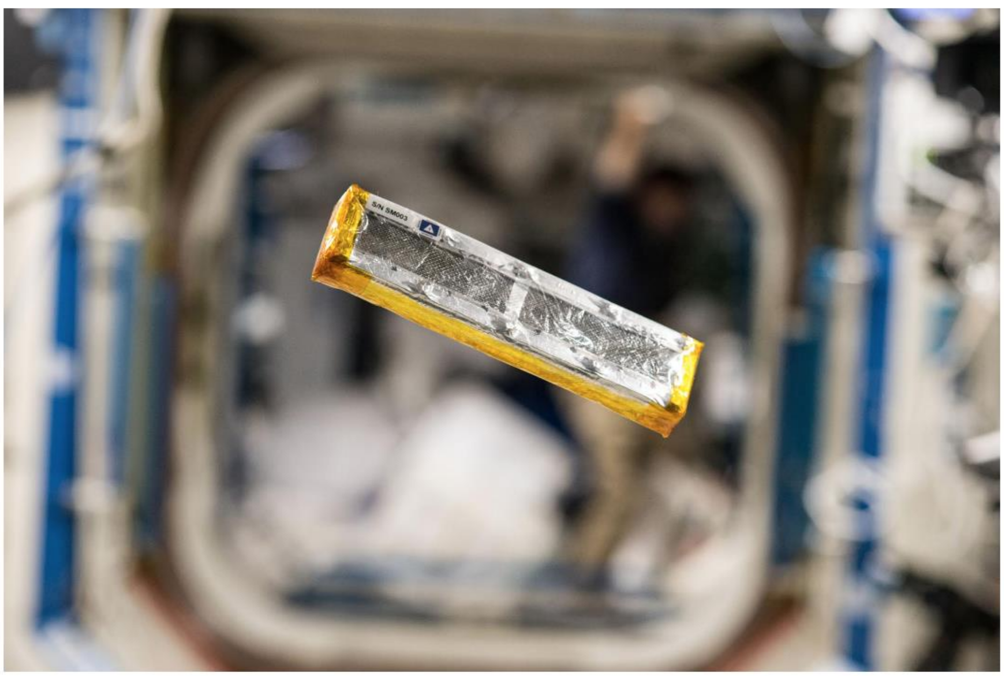
Ras Labs' Flexible Synthetic Muscle™ Polymer Returns to Earth After a Year of Extreme Durability Testing Aboard the International Space Station

Quincy, MA—July 26, 2016—Ras Labs, LLC, developers of contractile electroactive polymers (EAPs), today announced that its Synthetic Muscle™ polymers have returned to Earth after a year of extensive radiation exposure on the International Space Station (ISS). A collaboration between Ras Labs, the Center for the Advancement of Science in Space (CASIS), and the National Aeronautics and Space Administration (NASA) conducted experiments designed to examine the effect of rigors and extreme conditions in space on Ras Labs EAPs, with focus on the durability to survive high doses of radiation that would be lethal to humans several times over. Early results demonstrate that the polymers passed all tests, making it a viable material for space applications.

Ras Labs-CASIS-ISS Synthetic Muscle Experiment on the International Space Station National Laboratory. View of one of the four protective cages, where each cage holds 8 Ras Labs Synthetic Muscle™ samples.



Source/Credit: NASA, photography by Astronaut Scott Kelly

"The results confirm what we had believed to be the case all along. Our Synthetic Muscle polymers can withstand extreme conditions in space, verifying its application for extreme environments," stated Eric Sandberg, Ras Labs' CEO. "The global robotics market represents over $25 billion in sales per year. Our smart materials have significant advantages over existing mechanical approaches, and we expect high market suitability in commercial solutions based on these inherent advantages."

Ras Labs' Synthetic Muscle material is made of robust electroactive polymers that can expand and contract with reversed polarity in response to electric input. Selected materials withstand extreme temperatures of minus 271°C to over 135°C, and have proven radiation resistance on Earth through testing at the U.S. Department of Energy's Princeton Plasma Physics Laboratory (PPPL) at Princeton University and now on the ISS. As a result, roboticists are looking at Ras Labs' Synthetic Muscle to provide motion and control, replacing the need for belts, pulleys, gears, or motors. The aeronautics industry and NASA are also looking at these new materials that can provide robotic actuation with potentially better control and dexterity compared to metal mechanical approaches without cumbersome weight additions.

"The potential for our polymers in space is significant. We also believe that, due to the polymers' potential to offer a high degree of dexterity, we have a sizeable number of additional market opportunities. To date, we have attracted attention from leading companies in prosthetics and orthotics, chemical manufacturing, athletic gear, robotics, electronic components, and sensors. The company has aligned resources in product design and testing as an effort to scale and run multiple product development paths in parallel," added Sandberg.

Ras Labs' electroactive polymer actuators have the potential to offer life-like motion and control for robotics, bionics, and rehabilitative prosthetics. The company has customized particular formulations of its patented materials to offer a unique combination of shape-morphing, impact attenuation, and flexible pressure sensing to improve the interface between artificial and biological limbs for amputees. This results in offering the potential for significant reductions in pain in patients due to prosthetic slippage and improper fit of prosthetic devices caused by volumetric changes of patients' limbs, making it suitable for therapeutic and diagnostic applications in the $4 billion orthotics and prosthetics market.

Conformal devices that can stretch and bend around the body while providing levels of sensory feedback have disrupted the health and fitness market, particularly in relation to the Internet of Things. Athletes and patients alike have taken monitoring into their own hands, and certain formulations of Ras Labs electroactive polymers could offer attractive solutions in a market that has reached over $2 billion in sales and over 3.3 million units sold last year.

While pressure sensors alone account for nearly $6.5 billion in annual sales, pieziorésistive sensors account for nearly 25 percent of that market. Considering that Ras Labs' EAPs polymers also act as variable resistive sensors and can detect changes in mechanical pressure, in essence providing for the sense of touch, the company is poised to offer innovations in the pressure sensing market, especially when flexibility and impact attenuation are also desired in one integrated solution.

Ras Labs will be able to address several market opportunities for consumer products and multiple medical, industrial, and military applications as the company achieves success in its initial target markets. Some of these additional markets include Aerospace Actuator Systems ($3.83 Billion by 2019), Autonomous Underwater Vehicles ($1.8 Billion by 2019), and Protective Sports Equipment ($2.1 Billion by 2017).

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About Ras Labs, LLC

Ras Labs believes in developing healing, enabling technology that bridges the gap between limitation and our full human potential, eliminating disability by restoring mobility and freedom of expression. Founded in 2003 by Lenore Rasmussen, PhD, the company focuses on advancing prosthetic design, merging form and function, using robust, electroactive polymer materials that could provide for life-like motion and control. Within the next five years, the company envisions the capability to provide for a seamless interface between mechanical and human systems, particularly for amputees and their prosthetic devices. For more information, visit www.raslabs.com.

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