



SPACEHAB®

Overview:

It is time we accelerate the return on the \$100 billion investment, made by the US and partnering countries around the world, to create the International Space Station (ISS). The initial vision for the ISS was to “permit quantum leaps in our research in science, communications, and in metals and lifesaving medicines which could be manufactured only in space.” NASA and partnering entities have taken the critical steps of building the ISS and making it operational. Now we arrive to the vital path where we must engage the private sector to commercialize these technological breakthroughs. Our Congress took these initial actions with the 2005 NASA Authorization Act designating the U.S segment of the ISS as a national laboratory and directing NASA to develop a plan to “increase the utilization of the ISS by other Federal entities and the **private sector**...” To date, SPACEHAB, Inc., a leading provider of commercial space services with a 25 year legacy of sending research to space, is making one of the only private company bringing that vision to fruition. SPACEHAB has achieved significant milestones by executing a broad Space Act Agreement with NASA to establish the procedures necessary to support commercial utilization of the microgravity platform that exists in the ISS National Laboratory. AstroGenetix, Inc. was created by SPACEHAB to commercialize biotechnology products and services processed in microgravity, which is a unique environment found only in space. We are developing both the hardware and the protocols necessary to execute the processing of products in microgravity. Through expertise gained by sending more than 1,500 science experiments into space for NASA, we offer platforms for pre-flight sample preparation, flight hardware, mission planning and operations, crew training and certification processes needed within the highly regulated environment of manned space flight. The Company is now poised to transition from supporting government-sponsored basic research into producing commercial products from microgravity discoveries. AstroGenetix is playing a crucial role in the utilization of the International Space Station as a key industry stakeholder. Through the company’s work, technological breakthroughs in space are leading to medical developments on earth.

Background:

One current example of AstroGenetix success is the company’s Vaccine Processing Platform (VPP). Previous experiments showed that growing microbes in the microgravity environment of space results in significantly increased bacterial virulence due to differential expressions of genes and protein in the microgravity environment. AstroGenetix has applied this knowledge to develop a flight platform for identifying key bacterial components responsible for the increased virulence. These components become viable targets for vaccine development, leading to a commercial product with the capacity for worldwide distribution.

Progress:

The company’s research on *Salmonella* established an industry milestone with the designation of NASA’s National Laboratory Pathfinder, paving the way for utilization of the ISS National Laboratory. The discovery of a human vaccine for *Salmonella* represents the world’s first commercially-sponsored vaccine development program founded on novel discovery in microgravity and it is a key milestone for both space and biotechnology industries. The company is planning to submit a new drug application to the Food and Drug Administration in the coming months.

Recommendations:

1. Access to ISS for continued commercial research utilizing microgravity is key to the successful utilization of the ISS.
2. Development of a multi-year mission for life sciences lead by industry that will utilize microgravity to produce significant breakthroughs in drug and vaccine development.