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Sharklet Technologies, Inc.

“The Importance of the Innovation Pipeline for Small Businesses and Workforce Development”

Thank you for inviting me to be here, it is truly an honor.

I am Ethan Mann, VP of Business Development and Marketing at Sharklet Technologies, Inc. in Aurora, CO, just outside of Denver. Sharklet Technologies, Inc. is a start-up company developing a novel surface texture applied to consumer products and medical devices to prevent the spread of germs that cause infections. The novel paradigm-shifting concept was the brainchild of Dr. Anthony Brennan, a Professor of Engineering at the University of Florida, in Gainesville, FL. Dr. Brennan noticed that tiny surface textures impact the biological response of cells, like bacteria. He also noticed that sharks are not susceptible to fouling like whales, manatees, and sea turtles. When he studied shark skin, he noticed that it has a specific texture and when that texture is reproduced on plastic surfaces, it is able to prevent the accumulation of bacteria that contributes to common medical device infections. Sharklet has been developing applications for this technology in Colorado ever since Dr. Brennan’s discovery.

Stories like these are inspiring as we learn more about the world around us and how research and innovation can have a lasting impact on patient lives. In fact, the United States has built the world’s leading innovation factories in its academic institutions and small businesses. The UN’s Global Innovation Index ranks Northern America as the top region for innovation economy. This has developed for many reasons, the most important of which is the active support for innovation. To get beyond the initial concept stage, technologies require the expertise and execution from small businesses. I’ve seen the development of many technologies beginning once the innovation leaves the academic research centers in one form or another.

When a small business leader takes over, the commercialization process begins in earnest for truly impactful technologies. Innovations are exposed to market forces that serve to sculpt productization. For example, manufacturing capability or scalability, regulatory strategy, and customer discovery all have massive impacts on how a technology is delivered to the public. Technologies with the best likelihood of navigating early commercialization evaluation are those that also have exclusivity protections, usually in the form of patent protection. Other competitive barriers can be developed, but intellectual property protections are the most important to securing a developing technology’s value. Founders and investors tasked with delivering an innovation to the marketplace rely on market exclusivity provided by these competitive barriers to deliver an attractive return on the investment risks taken.

Developing novel innovations for market readiness requires significant investment regardless of the sector involved. ScienceDirect reports that medical device development requires about 7 years to go from concept to commercialization and cost more than \$31 million. Biomedical technologies require substantial safety and efficacy testing, usually to the molecular level, to satisfy regulatory approvals. Other advanced industry fields are similar due to the intricacies of the technologies. Manufacturing and development steps are all completed with the utmost scrutiny to ensure consistency and safety of the product used by consumers.

Given these circumstances around the risk, labor, and time it takes to launch a novel technology, what current and future support structures are the most critical to ensure successful commercialization and why are they important?

Innovations with a high likelihood of success are those that have been de-risked to the point where certainty of value surpasses the risk of failure for new ventures. More quickly driving technologies to this value inflection step should be the task of technology transfer offices around the country. Activity of these offices is critically important to ensure taxpayers are allowed to benefit from the technologies they have had a part in funding. Offices of technology licensing should be appropriately resourced to support the quantities of emerging innovations.

Resources may need to be expanded to track the fast pace of science occurring within academic research programs. Perhaps one of the best examples of support to de-risk innovations is the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grant programs which serve to fund proof of concept and early R&D activities for new innovations. Small businesses taking advantage of these mechanisms are at a distinct advantage. They have improved their technology and added value without selling equity which dilutes investors.

Small business on the front lines of R&D need additional resources to maximize commercialization of technologies. Technologies are rarely finished with innovation once they've left the academic lab. The SBIR and STTR programs do not allow funding to be used for critical business activities protecting long-term value, like intellectual property (IP) protection or regulatory strategy. Both of these functions are critical for the commercialization process. New or revised programs providing small businesses with funding mechanisms allowing for IP filings or regulatory work could improve commercialization of important technologies thereby dramatically changing the public's access to the latest technologies and cures.

Finally, delivering novel technologies to the marketplace provides a value well beyond the obvious use of the technology. Supporting small businesses and innovation fuels entire community growth. For example, the life sciences industry in Colorado, my home state, has been valuable for the state's economy. The life sciences industry provides more than 30,000 high-paying jobs with an average annual salary of \$89,000. Moreover, these direct jobs lead to an estimated 92,700 indirect jobs. I sit on the board of directors for the Colorado Bioscience Association, CBSA. CBSA is a state organization that creates co-opportunity for the Colorado life sciences community. CBSA champions a collaborative life sciences ecosystem and advocates for a supportive business climate.

Workforce collaboration is key to the growth and maturation of any industry. CBSA and the life science industry together work to cultivate a strong life sciences talent pipeline in Colorado with several different workforce development and training programs including various interactive educational experiences, mentoring, internships, workforce skill building, and leadership development.

And Colorado life sciences companies see the value of engaging not only in K-12 but higher education. In fact, Sharklet Technologies, for example, engaged CSU biomedical engineering students each of the last four years to complete a senior design project as part of their senior-level course work. These projects included core components of Sharklet product development activities.

As industry and the business community continue to collaborate and work together to support life sciences and these important innovations the industry will continue to grow and thrive while seeing more innovations coming out of our great state and the entire country. With this work, ultimately, innovations will improve lives. We will also see continued job creation which provide high-paying, globally engaging and rewarding opportunities, and students young and old are provided relevant experiences while discerning opportunities of interest. Support from the Committee on Small Business and the Subcommittee on Innovation and Workforce Development is critical to reduce barriers and ease the ability to bring technologies to life.

