

From Discovery to Commercialization: Rock Spring Bio's Journey Through DMCSP and Propeller

For many university researchers, groundbreaking discoveries stay in the lab. For the team behind **Rock Spring Bio**, an idea born in academic research is steadily evolving into a commercial venture with real-world applications—thanks in part to support and connections made through the Defense Manufacturing Community Support Program (DMCSP) and the Propeller accelerator at the First Flight Venture Center.

What began as a scientific curiosity about enzyme immobilization has grown into a startup focused on sustainable, reusable biotechnology solutions for research and industry.

An Idea Takes Shape

At East Carolina University, chemistry professor and researcher Robert Hughes, Ph.D., spent years studying enzyme immobilization—finding ways to capture enzymes onto surfaces so they can be reused rather than discarded after a single use. "When I started my academic research lab, one of the things we were interested in was enzyme immobilization—how to optimize it and what kinds of applications it might be useful for," Hughes explained.

But transforming promising research into a viable business is a very different challenge than publishing scientific papers. That turning point came in 2023 when Hughes connected with Emil Runge and RTI's Steven McManus through the DMCSP-supported Propeller program at First Flight Venture Center. Designed to accelerate innovation and commercialization, the advanced textiles-focused cohort helped researchers and entrepreneurs evaluate whether their ideas could solve real-world problems.

At the time, Rock Spring Bio was still just an idea. "We entered Propeller with an idea, not really a startup," Hughes said. "We wanted to ask: What if we incorporated enzymes into fabrics? How would we do that? What would the applications be?"

Learning How to Commercialize Innovation

Through Propeller, Hughes and his team gained far more than technical guidance. The experience helped them think like entrepreneurs—evaluating market fit, commercialization pathways and customer needs. "The program really makes you think about how the rubber meets the road," Hughes said. "How are you going to create something in a saleable form that solves a problem for someone and ultimately becomes sustainable?"

While the original advanced-textile concept evolved in new directions, the experience became foundational in

launching what ultimately became Rock Spring Bio. The company now focuses on creating reusable enzyme-based products for bench scientists and industrial applications—technologies designed to make scientific work easier, more efficient, and less wasteful.

Solving Real Problems with Reusable Biotechnology

In simple terms, Rock Spring Bio's technology captures enzymes onto specialized surfaces or materials, allowing them to be reused multiple times instead of discarded after a single application. That capability could unlock more environmentally friendly industrial solutions.

One example? Textile wastewater treatment. Traditional dyeing processes often generate wastewater contaminated with residual dyes. Rock Spring Bio is developing immobilized enzyme technologies that could help break down dye contaminants more sustainably. The concept could eventually be integrated into cartridge or flow-through systems, in which wastewater passes through enzyme-treated materials that help degrade pollutants before disposal. "Instead of a one-and-done application, our technology allows enzymes to be reused over and over," Hughes said. "That opens opportunities for more efficient and environmentally friendly processes."

Building Momentum Through North Carolina's Innovation Ecosystem

Since completing Propeller nearly three years ago, Rock Spring Bio has made meaningful progress toward commercialization. The company has pursued hybrid academic-industry grants, explored Department of Defense funding opportunities, and continued refining its technology for market readiness. Hughes says the company expects to launch reformulated versions of its initial products this summer to create greater marketplace impact.

Just as important as the funding pathways has been the network. Hughes credits the DMCSP-supported Propeller experience for helping him better understand North Carolina's innovation ecosystem and introducing him to people willing to share expertise and guidance. "Once you make connections in that world, it becomes incredibly beneficial," Hughes said. "There are so many people who are generous with their time and willing to help you think through opportunities, partnerships and challenges." The connections made through Emil Runge, Steven McManus and First Flight Venture Center continue long after the formal program ended.

Expanding Into Defense and Maritime Applications

The commercialization journey has also opened doors to broader applications, including defense and maritime innovation. Rock Spring Bio has already pursued Department of Defense opportunities through Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) proposals, gaining valuable insight into military applications for its technology.

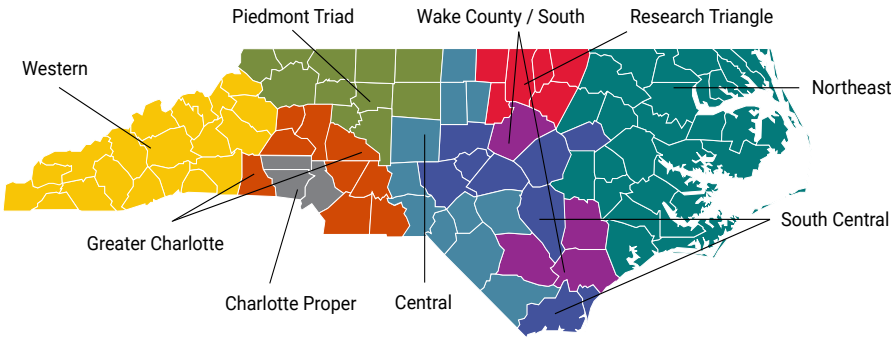
At the same time, Hughes's research has inspired a related venture, AquaVest, focused on environmentally friendly anti-fouling marine coatings designed to prevent barnacles and aquatic organisms from accumulating on ship hulls—a costly challenge for commercial shipping, military vessels, and recreational boats alike. That project emerged from additional grants and exploration sparked by lessons learned during the commercialization process. "In a way, Propeller got us thinking about some of these ideas," Hughes said.

Advice for Future Innovators: Just Start

For other researchers or entrepreneurs considering commercialization, Hughes offers straightforward advice: Don't wait until you feel fully prepared. "You don't know what you don't know," he said. "This process takes years, and it's a long road. Don't let being a novice keep you from getting started. Go into it open-minded and enjoy the process of developing your technology, your idea and your business along the way."

For Rock Spring Bio, the path from laboratory discovery to commercialization is still unfolding—but with support from DMCSP, First Flight Venture Center and North Carolina's entrepreneurial ecosystem, what started as an academic concept is steadily becoming a scalable innovation with the potential for broad scientific, industrial and defense impact.

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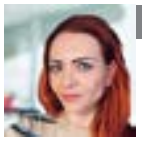
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