

BIOSYSTEMS COMPANY BUILDS TECHNOLOGY THAT REDUCES BUSINESS COSTS & IMPROVES ANIMAL WELFARE

APPPLIED LIFESCIENCES & SYSTEMS' MOTTO is "Productivity for Life." Since its founding in 2015, Applied LifeSciences & Systems has quickly established itself as a productivity leader for biosystems innovation in the agricultural industry. With groundbreaking technology, the company has continued to strive towards enhancing the lives of animals and fixing problems with current industry standards. However, despite its motto and innovative solution to a tough industry problem, during its early stages of development and commercialization, Applied LifeSciences & Systems still narrowly escaped the business world's Valley of Death.

Poultry vaccination typically uses a generalized, mass-application approach, often resulting in uneven vaccine delivery to the animals, leaving some less protected. Producers then must deal with animals that get sick, treating them with costly antibiotics. Overall, the entire situation costs the agricultural industry an estimated \$11 billion per year. Recognizing the problem, Applied LifeSciences & Systems built its technology in 2016, after receiving a Phase I Small Business Innovation Research (SBIR) grant from the National Science Foundation (NSF).

"NSF enabled us to build our initial prototype, which is an innovative, individualized, targeted vaccine delivery system for the poultry industry," explains Ramin Karimpour, founder & Chief Executive Officer of Applied LifeSciences & Systems. "With the help of our technology, companies will be able to deliver appropriate amounts of vaccine to chicks evenly, which saves companies from costs associated with uneven vaccination of their animals."

But raw materials, equipment, and contractors quickly eat up grant funds. "Unfortunately, the NSF grant was not large enough to cover all of our research and development costs. Thankfully, we were awarded a One North Carolina Small Business Program grant, which allowed us to finish our prototype and pay invoices to our contractors," explains Mr. Karimpour.

The One North Carolina Small Business Program provides matching funds to North Carolina companies that receive federal Phase I awards. The 'Valley of Death' is often referred to as the time between developing a proof of concept and commercialization, when technological businesses are often short on financial capital and most likely to fail. After landing the state award, Applied LifeSciences & Systems began testing its prototype, which resulted in additional awards.

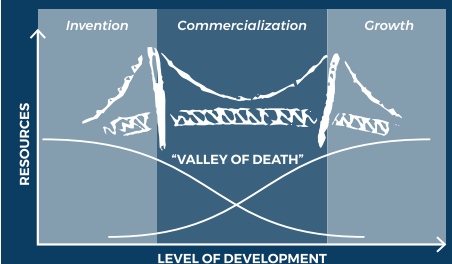
"Following the support from the State of North Carolina and the completion of our initial prototype, we tested and refined the technology to advance it for industrial use," said Mr. Karimpour. "This was a sign of good things to come. We eventually received a Foundation for Food & Agricultural Research grant, as well as a Phase II NSF SBIR grant, to help us with rapid prototyping as we worked towards commercialization. Today, our latest technologies incorporate artificial intelligence as part of a process that will allow us to vaccinate up to 100,000 chicks per hour at higher quality levels than before."

Poultry producers will benefit from Applied LifeSciences & Systems' technology and enjoy measurable results in the form of lower poultry production costs and overall improvements to animal welfare. The greater animal health industry has also taken note of their success; in March 2019, the company closed on \$8 million in capital through a Series A round, with the round co-led by Merck Animal Health and Mountain Group Partners. With no known alternatives to its individualized-vaccination technological systems, it's safe to say that Applied LifeSciences & Systems' innovative approach has hatched success for both the company and the larger poultry industry it supports.

ABOUT THIS SERIES

Entrepreneurs and business owners face many challenges during the life of their companies, but none strike more fear and difficulty than the 'Valley of Death.'

A familiar phrase to venture capitalists and business executives, the Valley of Death is the period of time a company must navigate between the discovery of a business-worthy idea or technology and the point when the company generates enough paying customers and revenue for long-term survival, job creation, and profits. Finding funding sources to bridge this gap is an ongoing struggle.



The One North Carolina Small Business Program helps promising, technology-oriented companies in the state survive and thrive. By providing matching dollars to companies that have already won highly-competitive federal technology grants, the OneNC Small Business Program is an important solution for North Carolina companies facing one of the business world's toughest challenges.

BRIDGING THE VALLEY OF DEATH: A One North Carolina Small Business Program SUCCESS STORY



one north carolina Small Business Program

ABOUT THE PROGRAM

- Established in 2005 (§ 143B-437.80-81), the Program awards matching funds to small businesses that receive federal Phase I Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) Phase I grants.
- SBIR and STTR grants are the single largest source of early-stage technology development and commercialization funding for small businesses (more than \$2 billion annually) – larger than all private sources combined.
- Yet the federal grants are often not large enough to allow the small businesses to complete their work, and federal restrictions on the uses of grant funds often limit the businesses.
- The North Carolina Program supplements and leverages the federal funds, helping homegrown businesses commercialize innovative technologies & create jobs.
- Since Program Inception:
 - 398 grants awarded
 - Over \$24.7 million awarded
 - 255 different companies in 25 counties and 41 cities across the state have received funding
 - More than 900 jobs created or retained
 - More than \$500 million in external capital investment
 - More than 100 patents and copyrights already received, and another 250 applied for and under review
 - More than \$125 million in total sales resulting directly from the technology developed with Program funding
 - More than \$1.5 billion in total sales resulting indirectly from licenses of the technology developed with Program funding
 - More than 95 percent of the grantee businesses agree that the Program encourages the establishment and growth of high-quality, advanced technology firms in North Carolina

For more information, visit:

nccommerce.com/grants-incentives/technology-funds



Applied LifeSciences & Systems
Productivity for LifeSM

ABOUT THE COMPANY

- Applied LifeSciences & Systems (ALS-S) is a bio-systems company focused on improving animal health and productivity in the poultry, livestock, and aquaculture industries.
- Year Founded: 2015
- Office Location: Raleigh, N.C.
- Current Number of Employees: 15
- Website: als-s.com
- Federal SBIR/STTR Funder: National Science Foundation
- One NC Small Business Grant Recipient in 2016



Chicks await vaccinations in ALS-S' technology.



The Applied LifeSciences & Systems team in March 2019, with founder Ramin Karimpour (center back row).



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