

# Case Study: Liberate Medical Finds Freedom to Innovate Via Key Federal Grant Program

## Early Funding Critical to Small Business Success

Competitive federal funding and state matching programs can be critical in the early days of a small company. These include funding through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grant programs administered through various federal agencies.

Liberate Medical of Louisville, Kentucky, used STTR grant funding to develop a respiratory muscle stimulation device that helps patients avoid lengthy invasive ventilation and recover more quickly from it.

Angus McLachlan, PhD, co-founder, CEO, and director, researched stimulation of the abdominal wall muscles in patients with spinal cord injury in his native Scotland. An American company exploring a therapy for chronic obstructive pulmonary disease recruited him to work on its project in the United States. When the company pivoted to other priorities, McLachlan and a group of colleagues formed Liberate Medical as a start-up.



**Angus McLachlan,**  
**Co-founder, CEO, Director, Liberate Medical**

The Liberate Medical device stimulates the respiratory muscles while a ventilator mechanizes breathing. When used early, muscle stimulation therapy can limit the muscle atrophy that can start within 24 hours of invasive ventilation. In turn, this can reduce the length of hospital stays and recovery afterward. This can be especially important for patients who are already weak from serious illness, elderly, or otherwise frail.

“It’s almost like weight training for your breathing muscles while you're on ventilation with the goal of preventing, or at least reducing, this atrophy from happening,” McLachlan said.

## **Liberate Medical Gains Ground**

Liberate Medical earned grants in two phases through the National Science Foundation STTR program, enabling the company to demonstrate proof of concept and the broader impact and commercial potential of the technology. State funding also contributed critical support.

The early funding was critical to attracting private investment, McLachlan said. While Kentucky does not have a big medical technology presence, it has strong policies and funding encouraging start-ups and angel investors. The initial federal and state funding helped Liberate Medical develop its technology and conduct experiments in healthy subjects.

The company estimates 33 percent of invasive ventilated patients could use the technology. So far, the device has shown strong potential. Earning a Breakthrough Device Designation from the Food and Drug Administration also built momentum.

“When you're just trying to get things off the ground and prove the concept with the initial technology, that's very risky,” McLachlan said. “That’s really where the grant funding is extremely helpful. There's a lot of technological development that has to work. You also have to do testing to show that the device actually works. It's a long process, and you need to have very patient angel investors to support that.”

Earning competitive grants also provides the external validation critical to investors in early days, particularly those without deep medtech experience, he said.

While some applicants might think the federal grant process is arduous, McLachlan found it fair and effective. The highly competitive nature of the grants and agency scrutiny helped the company document and explain its proof of concept, he said.

## **A Bright Future**

The company is preparing for its clinical trial that, if successful, would support final regulatory consideration from the FDA.

The future is bright, as Liberate Medical earns its place at each step of the process from concept to marketplace.

McLachlan called on Congress to make the STTR program permanent and ensure its reliable funding to help the agency support meritorious startups.

“The experience with the program in our case was extremely positive,” McLachlan said. “It’s a fantastic program that’s really allowed us to do the things that we can do. Anything I can do to help keep it around so other people can benefit from it, I’m happy to do that.”

### **About America’s Seed Fund**

Known as America’s Seed Fund, the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs offer highly competitive grants to stimulate high-tech innovations among entrepreneurs. Numerous federal agencies participate, ensuring a multidisciplinary response for public benefit. Since their establishment in 1982, these programs have provided more than 179,000 awards, totaling more than \$54.3 billion, to U.S. small businesses. A National Academy of Sciences study found a high commercial success rate for these start-ups.

### **About Liberate Medical**

Company: Liberate Medical  
Founded: 2013  
Location: Louisville, Kentucky  
Device: VentFree Respiratory Muscle Stimulator