

WHITE PAPER

INNOVATIVE FUNDING APPROACHES TO GET BREAKTHROUGH SCIENCE APPLIED TO YOUR DISEASE

How the Cystic Fibrosis Foundation is once again leading the way in developing new funding models to accelerate cure

Every disease foundation wants the most innovative technologies applied to their disease. The challenge is how do you entice the companies with these technologies to focus on your disease, especially if you have a small patient population?

The CF Foundation is implementing an innovative approach to attract companies with breakthrough science to focus on CF. We learned about their unique approach in a recent Kraft Accelerator convening that brought together CEOs from several leading disease foundations. Michael Boyle, MD, president and CEO of the Cystic Fibrosis Foundation shared the CF Foundations' remarkable work to develop effective therapies for all patients affected by CF.

This convening continues our work co-leading the HBS Kraft Accelerator. Our approach has been to bring together hundreds of thought leaders from across the private sector, academia, disease foundations, and government to identify first movers and best practices for accelerating cures.



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We created the Playbook for Cures and have published articles in Harvard Business Review on the keys to accelerating cures, which are strategy, funding, and leadership. Everything the CF Foundation is doing fits this model.

CF FOUNDATION'S STRATEGY

Cystic fibrosis (CF) affects more than 30,000 people in the United States and 70,000 people worldwide. It is caused by mutations that lead to absence or dysfunction of the CFTR protein, which results in pulmonary disease, pancreatic insufficiency, and other health problems.



In October 2019, a three-drug combination protein modulator (Trikafta) was approved by the FDA. This transformative treatment has the potential to benefit 90% of people with CF. However, the remaining 10% of people with CF do not benefit and will require genetic technology-based therapies.



Not content or satisfied with an effective treatment for just 90% of the CF population, Michael Boyle and the CF Foundation are now focused on the next area of great need: developing the therapies that will provide transformative treatment for everyone with CF.

Current Challenges

To achieve this, the CF Foundation must overcome two key challenges. The first is the **scientific challenge** of identifying the breakthrough technologies that will lead to transformative therapy for all. The key scientific strategies are:

1. Restoring functional CFTR protein despite a defective CFTR gene (RNA-targeted therapies)
2. Replacing or repairing the defective CFTR gene itself (DNA-targeted therapies)

The second is an **“attention challenge”**: determining how to motivate those innovative companies with the best, most promising technologies—which could be applied to numerous diseases—to apply their technology to the small number of CF patients for whom the existing therapies don’t work.

Since current therapies don’t work for only about 10% of patients with CF – or only about 3,000 patients in the US – it is a very small market. Who wants to take on drug development for such a small market? The companies developing the best, most innovative technologies will have much bigger opportunities than a small subset of an already rare disease.

The CF Foundation’s approach to solving this attention challenge has led to an innovative funding strategy.

The CF Foundation’s strategy is focused on taking proactive steps to identify breakthrough technologies that could apply to CF and enticing the companies that have developed these technologies to focus on CF.

THE CF FOUNDATION’S FUNDING STRATEGY

The CF Foundation was a pioneer among disease foundations in venture philanthropy. This strategy was successful in that it led to the first approved drug to address the underlying cause of CF. It was also successful in generating over \$3 billion in returns for the CF Foundation to reinvest in developing therapies for all patients.

CF Foundation Needed a New Model

For years, the CF Foundation behaved like other foundations engaged in venture philanthropy. While the CF Foundation had success with venture philanthropy, the basic model had two issues.

- **Too hot:** The best companies with the most promising technology were inundated with funding offers from venture capital firms—and therefore often wouldn’t come to the CF Foundation. The CF Foundation had difficulty convincing these hot companies to focus on cystic fibrosis.
- **Too cold:** Some companies making their way to the CF Foundation for funding had already spoken to and had difficulty raising funds from VC firms. Did the CF Foundation want to invest predominately in these high-risk companies?

The CF Foundation decided that instead of sitting back and only reacting to companies that sought them out, they needed to **become more proactive in identifying companies with relevant technology** early in the company’s lifecycle and convincing those companies to **focus their attention on CF**.

In becoming more proactive, the CF Foundation has embarked on three innovative partnership approaches:

1. **CF-Focused Incubator Fund.** The CF Foundation has partnered with the Longwood Fund, a leading VC firm focused on early-stage biotech companies. Working with Longwood, the CF Foundation created a \$20 million CF incubator fund focused on genetic technologies, jointly governed by Longwood and the CF Foundation. As Longwood learns about emergent technologies and they spot a technology that could apply to CF, they bring the opportunity to the incubator for consideration. This allows identifying potential breakthrough technologies early on, and through early financial support, influencing these companies to focus on CF.

This approach is working. In the incubator’s first two years, Longwood spotted eight technology companies that they thought could be applicable to CF. Michael Boyle said the CF Foundation would not have known about these companies or technologies had they not been spotted by Longwood. The incubator decided to invest in and is supporting two of these companies—both with a gene-editing focus—that have agreed to include a program focused on cystic fibrosis.



“THIS IS AN EXAMPLE OF A WAY OF TRYING TO ATTRACT THE BEST SCIENCE AND INCENTIVIZING [COMPANIES] TO FOCUS ON YOUR DISEASE.”



MICHAEL BOYLE, MD, CYSTIC FIBROSIS FOUNDATION

In addition to providing funding as part of these partnership approaches, the CF Foundation has worked to develop a complete ecosystem to de-risk, support, and accelerate commercial programs. Elements of this ecosystem include the Foundation’s 50-person lab in the Boston area, a network with over 100 care centers that provide direct access to patients, a registry with data on more than 90% of all CF patients, a clinical trials network, and extensive regulatory contacts.

In its partnership approaches the CF Foundation is being proactive to identify promising technologies and companies early on, convincing these companies to apply their breakthrough technology to CF, and providing capital and resources to de-risk help these companies and help them succeed.

2. **CF-Centric Portfolio Company.** Flagship Pioneering is another leading investment firm that builds human health platform companies. Flagship has created a portfolio company, Pioneering Medicines, that has licensed CF applications of genetic technologies from multiple Flagship platform companies. Pioneering Medicines brings these promising technologies together under one umbrella. Now, one dedicated team is working together—in partnership with the CF Foundation—to apply these technologies to cystic fibrosis. Bringing together multiple technologies under one roof is especially important since effective therapies often result from combining technologies.
3. **Golden Ticket Competition.** The CF Foundation will be holding a competitive pitch day on the West Coast for genetic technology startups that have promising technology and are interested in applying their technology to CF. The prize is two years of lab space along with scientific assistance from CF Foundation’s laboratory staff.

“THE WHOLE IDEA HERE IS TO CONTACT [TECHNOLOGY COMPANIES] EARLY, PROVIDE SOME INCENTIVE, BUT ALSO SET UP AN ECOSYSTEM FOR SUPPORT.”

MICHAEL BOYLE, MD, CYSTIC FIBROSIS FOUNDATION

CF FOUNDATION’S LEADERSHIP

The leadership of the CF Foundation under Mike Boyle epitomizes the ideas we shared in our HBR article, “[What it Takes to Lead a Disease Research Organization](#).” We identified three consistent approaches of successful leaders who are focused on accelerating cures.

1. **Live the strategy.** Mike and the Foundation’s leadership team are doing this in how they allocate their time and the Foundation’s resources, and in their constant communication of this strategy.
2. **Surround yourself with experts.** In HBR we wrote, “Most leaders of cure-seeking foundations realize that their foundation acting alone will not produce a cure. A cure will only be developed by orchestrating a focused ecosystem.” This is exactly what the CF Foundation is doing. Led by Mike, CFF has both partnered with a leading venture capital firm to form an incubator, and has partnered with a science portfolio company that is bringing together multiple technologies that can be applied to CF. Forming these partnerships required a significant investment of time and attention by the CF Foundation team. This may be the best example we have seen of “surround yourself with experts.” Further, the CF Foundation has created and is leveraging a comprehensive ecosystem consisting of scientific experts, care centers, its registry, and more.





3. Stay current and connected to the relevant science.

Again, being connected to the relevant science is the essence of the CF Foundation's strategy. The partnerships that the Foundation team has developed and the way they have leveraged their capital and resources has resulted in the CF Foundation being in the best possible position to identify and entice breakthrough science to focus on the small number of patients with CF who lack an effective therapy.

Everything the CF Foundation is doing exemplifies the outstanding leadership that is necessary to accelerate cures.

KRAFT ACCELERATOR DISCUSSION

As part of Kraft Accelerator sessions, foundation CEOs provide feedback, raise questions and share comments about the ideas presented. Among the most important comments were:

- **Understand the purpose of your organization's investment and your organization's risk profile.** Mike Boyle encouraged distinguishing between "are investments to fund your mission, or advance your mission?" If the goal is to fund your mission—which might be the case for a foundation with limited capital—it is appropriate to pick one or two programs with the best chance of commercial success, and not to take much risk.

A foundation such as the CF Foundation, which has already benefitted from successful investments to fund its mission, can take more risk in seeking to advance its mission. Few foundations have the asset base to be in this position.
- **Focus on value beyond money.** Foundations can provide significant value to startups that goes far beyond financial investment. This value includes the endorsement a company receives by partnering with a foundation, access to the foundation's advisors, and access to a clinical trial network, patient registry, and historical data.

CONCLUSION

In leading the Kraft Accelerator, our philosophy has been to identify innovative first movers and put a spotlight on what they are doing so others seeking to accelerate cures can learn from and emulate them. The CF Foundation under Mike Boyle is clearly a first mover in developing innovative partnership approaches to entice companies with breakthrough scientific technologies to prioritize cystic fibrosis.

Among the lessons for other foundations is that astounding science is being developed every day. The challenge is identifying the most relevant technologies and companies for your disease early on and proactively forming relationships with these companies.

As the CF Foundation has shown, identifying relevant technology and forming relationships can be done through creative partnerships with venture capital firms, by investing in early-stage companies, and by fully leveraging the value of a disease foundation's entire ecosystem.

