by Robin Robinson

Nontraditional Pharma Companies

As for-profit life-sciences companies abandon medicines that do not add to the corporate bottom line, nonprofit and nontraditional organizations are pursuing these promising treatments to provide patient populations with important medicines, vaccines, and generics.

One such nonprofit company that made headlines this year was Intermountain when it announced in January that it, along with others, was establishing a generic drug company. Last month the initiative, previously known as Project Rx, officially became Civica Rx. More than 120 health organizations representing about one-third of the nation's hospitals have expressed a commitment or interest in participating with the new company. The company is organized as a Delaware nonstock, not-for-profit corporation, with headquarters in Utah. Martin VanTrieste, former chief quality officer for Amgen, is the new CEO.

"We are creating a public asset with a mission to ensure that essential generic medications are accessible and affordable," Mr. VanTrieste said in a public announcement. "The fact that a third of the country's hospitals have either expressed interest or committed to participate with Civica Rx shows a great need for this initiative. This will improve the situation for patients by bringing much needed competition to the generic drug market."

Another nonprofit organization in the news is the Australian-based biopharma company Medicines Development for Global Health (MDGH), which was the first not-for-profit organization to earn solo FDA approval for a drug — moxidectin. It was also the first not-for-profit company to be awarded a priority review voucher (PRV) under the tropical disease PRV program. The oral medicine treats river blindness (onchocerciasis) in adults and adolescents. Onchocerciasis is a parasitic infection affecting sub-Saharan Africa, Yemen, and parts of Latin America.

Established in 2005, MDGH develops affordable medicines and vaccines for neglected diseases prevalent in low- and middle-income countries. Moxidectin research was funded by the World Health Organization's Special Programme for Research and Training in Tropical Diseases (TDR) until MDGH took over, and they raised a $13 million investment from the Global Health Investment Fund to complete the work.

MDGH was also the first company in the world to raise money on the basis of a PRV. In the world of for-profit biopharmaceuticals, return on investment does not exist when the people who need a drug can't afford it. In most cases, drugs for NTD are donated, so there's no financial incentive to develop them. However, the value of MDGH's PRV was enough to catch the attention of investors, and the group raised money on the promise of the PRV sale.

"As neglected tropical diseases are endemic in low- and middle-income countries, there are limited markets for medicines," says Mark Sullivan, managing director, MDGH. "Therefore, finding investors willing to support development in these diseases is extremely difficult. However, the introduction of the FDA's neglected diseases PRV program has created a market around neglected diseases."

People don't always understand why a company would want a nonprofit business model in the life-sciences industry, but Mr. Sullivan says a collaborative or community approach is sometimes the only way of addressing many unmet healthcare needs. A for-profit company may need to abandon ideas that cut into the bottom line too deep, whereas in the nonprofit world, everyone shares in the burden of getting medicines to patients.

Nonprofit and nontraditional initiatives skip the bottom-line and focus singularly on solving unmet medical needs.

"It takes a broad community to develop a new medicine, and an FDA approval represents decades of work by thousands of scientists, disease control specialists, expert advisors, community health workers, funders, and study participants," he says.

The Nonprofit/Nontraditional Model

Creating a business around a nonprofit or nontraditional model in the life sciences has advantages. These companies function in a more flexible, nimble, and collaborative environment that enable them to focus on solving meaningful healthcare issues that drive better patient care around the world. These organizations are in the business to make the world a better place, most commonly for those patients who have no other options for treatment. Their mission statements go far beyond a balance sheet.

"As a society, we have to find solutions to health issues and they need to be innovative, nimble, and cost-effective," Mr. Sullivan says. "Otherwise, we will have no new medicines for these neglected diseases — this experiment has been running for decades and the results are damning."

Our vision is to forge partnerships and new creative business models that better enable us to solve global health problems.

DR. PHIL VANEK
GE Healthcare Life Sciences

According to Craig Rayner, Pharm.D., senior VP, integrated drug development with Certara Strategic Consulting, operational models such as the one used by MDGH could be applied to resurrect other commercially marginal compounds in high unmet medical needs, including pediatrics, global health diseases, antimicrobial resistance, and medical countermeasures. "These commercially challenging product areas provide perfect environments for an 'innovation sandbox,' in which an outsourced team of experts could create new drug development approaches — methods, tools, clinical trial designs, and ways of presenting evidence, such as combining real-world evidence with modeling and simulation," he says. "The pathways, models, and regulatory science methods being pioneered in these commercially less attractive environments have the potential to drive development innovations more broadly across other therapeutic areas."

Operationally there's little difference between a profit or not-for-profit company. Each type of company has to meet the same regulatory bar and earn sufficient revenue to cover its activities. The difference lies in what the profits are used for.

"Our profits stay in the company and are spent on our legally and constitutionally enshrined purposes," Mr. Sullivan says. "We prefer to be called a social enterprise for that reason."

The challenges are also very similar in both instances. "Our primary challenge is the same as any other company doing drug development — funding," he says. "MDGH is also a public company, so we have additional reporting and legislative obligations."

Speaking for the nonprofit Centre for Commercialization of Regenerative Medicine (CCRM), CEO Michael May, Ph.D., says one of the advantages of being a nonprofit company is the access to resources and funding that come from governments and other public sources. However, he cautions against relying solely on those types of funding for a long-term mission. That is why at CCRM, the organization works

GE Healthcare, CCRM, and DiscGenics Partner in Cell Therapy

DiscGenics, a regenerative medicine company that develops therapies to alleviate pain and restore function in patients with degenerative diseases of the spine, has partnered with the nonprofit Centre for Commercialization of Regenerative Medicine (CCRM), and the nontraditional healthcare business GE Healthcare, to support its efforts to scale and optimize manufacturing of its injectable cell therapy, which is referred to as IDCT.

Through the partnership, the CCRM and GE Healthcare teams, working out of CCRM's Toronto headquarters, conduct process, assay, and media development for DiscGenics' manufacturing process, which begins with isolating cells from donated intervertebral disc tissue and results in highly specialized "discogenic cells" to address the complex environment of the degenerated disc. This approach enables DiscGenics to introduce restorative progenitor cells to the damaged disc and offers a therapeutic option for millions suffering from the debilitating effects of back pain.

The CCRM and GE Healthcare team is playing an integral role in these manufacturing initiatives by providing invaluable scale-up know-how and process development expertise.

CCRM and GE Healthcare are conducting the work through their partnership with the Federal Economic Development Agency for Southern Ontario (FedDev Ontario) in the Centre for Advanced Therapeutic Cell Technologies (CATCT).

"The DiscGenics project is an excellent case study of CATCT's ability to successfully accelerate scale-up and process development," says Michael May, Ph.D., president and CEO at CCRM. "This is yet another example of how CCRM and GE Healthcare are fulfilling our mission of supporting cell and gene therapy by industrializing cell manufacturing and delivering results that help customers develop better treatments for patients."

"Manufacturers need to be able to duplicate product attributes at larger scale as they progress through clinical trials and into commercial phases, so it's critical to develop scaled up manufacturing processes early on," says Phil Vanek, Ph.D., general manager of cell and gene therapy strategy at GE Healthcare Life Sciences. "DiscGenics was an early adopter of the process development capabilities we've built together with CCRM, and we look forward to continued collaborations."

closely with industry and investors, as well as facilitates and funds commercialization of cell and gene therapies.

"We are a nonprofit organization with a mission to be self-sustainable and a goal to reinvest our stake in commercial successes back into the community," Dr. May explains. "Because our focus is commercialization, we're doing activities that have a for-profit angle to them, such as holding equity in companies that we help create. Consequently, we have a for-profit subsidiary."

Commercialization is characteristically a for-profit activity while more traditional nonprofits focus on enhancing research in a certain area and leave the commercialization to others. "The challenge of a nonprofit is that it is bound by some of its activities," Dr. May says.

Having a for-profit entity allows CCRM to generate revenue for sustainability, but also generate strong relationships that build credibility and reputation in the industry. And by engaging with both academia and industry, CCRM is creating a bridge to ultimately build the capabilities of a new ecosystem.

CCRM has multiple legal structures to accommodate being a public-private partnership that is intended to catalyze commercialization. "CCRM has a large team, 100% committed to commercialization. And we have unique infrastructure, particularly around manufacturing and enabling process development, and specialized funding to drive commercialization forward," Dr. May says.

Based on its success building meaningful relationships with academia and industry, CCRM is building its third key network: an investor network. Access to private capital is needed to fuel the model at CCRM, not just seed funding from government with some industry matching funds.

"We take equity in the activities that we do so that if there's success in the future we can take a piece of the company for sustainability, this way we don't always have to go back to the government for funding," Dr. May says. "The overall aim is to recycle profits back into the community."

Overall, CCRM operates under the concept that collaborating across all stakeholder groups is a better, more effective way to do business, and that is an underlying feature of CCRM's commercialization strategy. The premise is that in an emerging industry like cell therapy where there is so much complexity, competition and lack of resources, coordinated collaboration and partnering can accelerate progress. Dr. May sees this operational model as a bright future for regenerative medicine.

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>
> **MARK SULLIVAN**
> Medicines Development for Global Health

Nonprofits Benefit From Partnerships

The partnership between MDGH and Certara, a decision support technology and consulting organization, helped guide development toward approval of moxidectin. (See box for more information.)

Through its virtual drug development approach, MDGH was able to assemble an elite, high-functioning team on a budget, creating a lean but highly effective operational model, Dr. Rayner says.

"Extremely thin capitalization, such as that experienced by many nonprofit companies, both inspires and requires innovative thinking, especially regarding how a project is operationalized," he says. "By 'leasing' instead of hiring the best available practitioners to augment its team's strategy and stewardship, MDGH was able to adjust its team makeup as required, ensuring that it had access to the optimal skillset at each step along the drug development continuum in a very cost-efficient manner."

A small MDGH in-house team served as project manager, identifying, and then partnering with very experienced drug developers at consultancies and companies around the world. By engaging purpose-driven, highly competent experts, establishing a team culture that fosters innovation, and adopting contemporary tools such as modeling and simulation, MDGH succeeded in using all the available data and running leaner studies. It also created some novel drug development approaches and innovative ways to package and present data to make the case for moxidectin's approval.

Although GE Healthcare's cell and gene therapy technology division is a for-profit business, it is considered nontraditional both in terms of how it was formed and how it collaborates with nonprofit organizations. GE Healthcare is a holistic medical imaging, digital, and services company. Its Life Sciences division provides technology and services that enable pharma and biotech companies to manufacture drugs through scalable, start-to-finish manufacturing platforms.

In June of this year, GE announced its intention to separate from GE Healthcare, a move that would allow GE Healthcare, as a stand-alone, pure play healthcare business, greater flexibility to pursue future growth opportunities, react quickly to changes in the

industry, and invest and partner in more innovation.

"As a stand-alone company, GE Healthcare could create its own creative business model, vision, and partnerships that will enable us to solve global health problems," says Phil Vanek, Ph.D., general manager of cell and gene therapy strategy at GE Healthcare Life Sciences.

If it hadn't been for the initial investment from GE Ventures and its confidence in the work GE Healthcare was pursuing, the cell therapy division may never have been born. Leaders from both GE and GE Healthcare had the vision to create what is today a rapidly growing cell and gene therapy technology business, even if the plan didn't fit the normal investment profile. Both GE and GE Healthcare leaders were behind the venture.

"If any other company had looked at this opportunity purely from a financial perspective, it might have determined there were other more high-value places to make investments in the short term," Dr. Vanek says. "Looking forward, we see this as a moment in time where GE helped build an environment of collaboration through interesting industrial partnerships and now we can make a difference in world health by enabling industrialization to take shape."

Since then, several partnerships in cell and gene therapy have been formed, one being the collaboration between GE Healthcare, CCRM, and DiscGenics.

"Gene and cell therapies are transformational therapies that are having a huge impact on the lives of patients who are in dire need of new therapies," Dr. Vanek says. "The promise of cell and gene therapy or more broadly the category of regenerative medicine is that rather than treating symptoms we'll ultimately be getting to a point where we're treating the underlying mechanism of disease and potentially, dare we say, potentially providing cures or at least very durable treatments to those patients that are seeking new help for their particular indication."

Dr. Vanek expects the partnership between CCRM and GE Healthcare to continue bringing new tools and technologies that will help make therapies more widely available. "We'll take out a lot of the risks of manufacturing, we will look to help bring the cost of goods to such a point that these therapies could be more widely available — not only in the West where healthcare expenditures are higher per capita — ultimately around the world to all the different populations that might be suffering from these ailments."

> Our high-level goal is to catalyze the creation of an industry and to ultimately accelerate promising discoveries into products.
>
> **DR. MICHAEL MAY**
> Centre for Commercialization of Regenerative Medicine

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>
> **DR. CRAIG RAYNER**
> Certara Strategic Consulting

Dr. May identifies the alliance with GE Healthcare and the Canadian government as a great example of a successful public-private partnership.

"We're using public funding and private funding to achieve our mission, which is to accelerate the development of these revolutionary products," he says. "Our overall mission is really aligned with a nonprofit mandate because the sustainability model of CCRM is not about achieving returns for investors or shareholders. Our mission dictates that any benefits that accrue to us over the long-term we will recycle back into the ecosystem or back in the community to grow the industry."

Dr. Vanek at GE Healthcare expects to see more nontraditional and nonprofit models emerge in the future, especially as competition increases for funding dollars. There are opportunities for development just waiting for the right company or collaboration to take up the mission and a smart company would be foolish not to try to take advantage of all of these unique opportunities and tap into the skill sets and the know-how that exists across the world, he says.

"It's the way the world is moving. There are big missions ahead of us and there is this need for people to cooperate and collaborate," he says. "Companies and not-for-profit organizations have to find new and creative ways to get more out of the dollars being invested." PV

Certara and Nonprofit Medicines Development for Global Health Team Up for Drug Development

Certara, a model-informed drug development, regulatory science, market access, and real-world evidence solutions company, was enlisted by Medicines Development for Global Health (MDGH) to be a key part of its integrated drug development team to gain U.S. FDA approval for moxidectin, an oral treatment for river blindness (onchocerciasis) in patients 12 years of age and older.

Certara partners with industry, academia, charitable foundations, regulatory bodies, and governmental organizations to increase understanding of the science and population impact of public health diseases. Certara has developed and contributed to specific drug development tools and development programs for malaria, tuberculosis, HIV, hepatitis, neglected tropical diseases, multiple drug resistant infections and scores of rare and orphan diseases.

"The phrase, 'doing well by doing good,' epitomizes Certara's culture and philosophy as we partner with the biopharma market to address public health challenges," says Craig Rayner, Pharm.D., senior VP, integrated drug development with Certara Strategic Consulting (CSC).

Several CSC staff members are part of the MDGH's global virtual development team for moxidectin, providing expertise in areas that include membership of the development governance committee, leadership of clinical pharmacology and pharmacometrics, and support for MDGH's translational medicine, regulatory science and strategy activities.

The end result: moxidectin received FDA approval in June of this year and is preparing for market.