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A small team of longtime collaborators has just launched its third photonics company out of a Rocky Hill lab they've used for more than a dozen years. (Left to right) Co-founder Paul Sanders, principal scientist Yi Yang, and co-founder Trevor MacDougall. Not pictured are technical staffers Frank Birritta and Scott Nelson.

PHOTO | MIKE MARCHAND

Laser Focused

Rocky Hill photonics team shifts entrepreneurial focus, setting sights on cancer treatment

By Matt Pilon
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Over the past 13 years, two longtime friends and a small team based in Rocky Hill have broken their way into the global energy sector, developing acoustic and fiber-optic sensors and software that have enabled more efficient production in mile-deep oil and gas wells as well as improved moni-

toring of electric grid cables.

Now Trevor MacDougall and Paul E. Sanders — serial entrepreneurs who have founded two companies and successfully sold one to a Canadian energy firm in 2012 for a hefty but undisclosed sum — are pivoting their fiber-optic sensor technology platform to improve a lung cancer treatment called photodynamic therapy, or PDT.

Their latest company, Lumeda — backed by an initial \$1-million investment from Connecticut Innovations and Branford-

based Cycle Venture Partners — is hoping to get U.S. Food & Drug Administration approval within the next two years for an optical device that automates the targeting and dosage of laser light to the site of a newly removed thoracic tumor. That light interacts with a drug called Photofrin that's injected into the patient ahead of surgery and ultimately kills cancerous cells.

The hope is that improving on PDT delivered during lung tumor removal surgery will improve outcomes for patients and significantly reduce both costs and the amount of time the normally manual process takes in the operating room.

Lumeda represents a major pivot for MacDougall and Sanders — who have worked together for more than 30 years — and their three-person scientific and technical team,

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which operates out of a 5,000-square-foot lab and office space tucked away in Rocky Hill Industrial Park.

Like their predecessor companies, Lumeda will be heavily focused on engineering, photonics and fiber optics, but it's targeting the medical-device market rather than the energy sector, where MacDougall, 58, and Sanders, 62, have developed decades worth of contacts and expertise.

"It's a good fit for our photonics technology," said MacDougall, who has a master's degree in electrical engineering from the University of Bridgeport. "It's going to require some new innovations for us."

Longtime collaborators

Sanders and MacDougall have a long history together across multiple companies and roles.

"Paul and I have been working together since 1986," MacDougall said. "He's known me longer than some of my kids have."

The two first crossed paths working at 3M in West Haven. In the mid-1990s, they switched jobs together and went to Wallingford-based CiDRA's optical sensing division, where they became steeped in monitoring technology for oil wells, and first crossed paths with Alan Kersey, a CiDRA executive and entrepreneur who nearly 20 years later would help seed Lumeda as a partner with Branford venture capital firm Cycle Venture Partners.

In 2001, Houston, Texas-based Weatherford International acquired the CiDRA unit for \$125 million.

By 2006, MacDougall and Sanders sensed an opportunity to launch their own company, and with the help of an investment from Canada-based Alberta Green Ventures, they began developing fiber-optic sensing systems for high-temperature, high-pressure wells and started a company called Qorex.

The fiber-optic sensors were installed down the entire length of two-kilometer well holes, providing data that ultimately allowed for greater oil extraction, MacDougall said.

"You can infer flow rates, injection profiles, all sorts of things," he said. "It gives you a real-time picture of what's going on in the well."

As is still the case today, MacDougall was in charge of the science, while Sanders, who has a chemistry degree, handled business development.

"It works really well," Sanders said of their intermeshing roles.

Qorex's first sales came quickly, with systems installed in Canada and the Middle East. Annual revenue eventually reached approximately \$5 million, the co-founders said.

In 2012, a private well-monitoring company called Petrospec, based in Alberta, Canada, acquired Qorex. The price was never disclosed, and Sanders declined to provide it for this

story, but he said the deal produced an almost 10-time return on Alberta Green Ventures' initial investment.

That first success has been a motivator for the duo's continued business partnership.

"The opportunity to bet on yourself and a trusted team has got to be one of the most exhilarating feelings I have experienced," MacDougall said.

The next venture

MacDougall and Sanders stayed on with Petrospec until around 2017, when they sensed their second opportunity.

Convening the same five-person team in Rocky Hill, they launched LuxPoint, which aimed to leverage their sensor expertise to provide more advanced monitoring of the electric grid, with the aim of enabling clean-energy technologies and detecting faults in power cables.

Ultimately, the venture would be shorter-

lived. LuxPoint hadn't yet reached commercial revenue when MacDougall and Sanders dissolved the company's Connecticut business registration earlier this year.

They said a Texas investor now controls the company, and is working to develop patents and commercialize products. The two co-founders retain some equity in it, but are not involved in operations.

While the outcome was not as splashy as Qorex's, LuxPoint could still find future success, Sanders said, so he doesn't view it as a failure.

"It's still viable, it's actually a really good product," he said.

One of the main reasons the two decided to part with LuxPoint is that the medical device market had captured their attention.

A quick pivot

The MacDougall-Sanders team — which includes Yi Yang, principal scientist, and technical staff members Frank Birritta and Scott Nelson — are now working over the next six-to-nine months to double Lumeda's staff and raise more money.

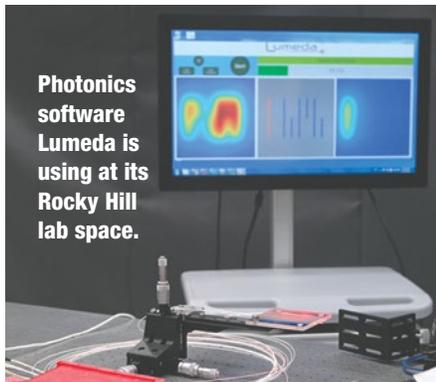
The optical device they're working to modify, under the terms of an exclusive license, was first developed by Roswell Comprehensive Cancer Center in Buffalo, New York, where PDT originated in the 1970s.

It's a flexible optical surface applicator, made of silicon mesh with optical fiber placed in several channels. The device would be placed on the wall of the lung during surgery to optimize the delivery of the light to the tumor site. The idea is to kill as many remaining cancer cells as possible to reduce the chance that they later spread through the bloodstream to other parts of the body, such as the brain or liver.

MacDougall and Sanders, while technically talented, know they aren't medical experts, so they're in the process of recruiting a scientific advisory board, which will include clinicians from Hartford HealthCare and Yale.

Sanders says the Roswell device is promising, but he thinks his team can improve on the technology.

"PDT hasn't had a lot of good engineering done," he said. "We are one of the first pure photonics companies to apply our engineering to [PDT]."



Photronics software Lumeda is using at its Rocky Hill lab space.