Divergence raises $11.8M for crop, pesticide technology

February 16, 2009 - Exclusive By Emma Ritch, Cleantech Group

St. Louis biotech firm seeks to target unique genomes in nematodes to develop safer pesticides, pest-resistant crops and medicine.

St. Louis, Mo.-based Divergence said today it raised $11.8 million in Series C funding to continue development of its technology to prevent or control parasitic nematode infestations.

CEO Derek Rapp told the Cleantech Group the company is mapping the genomes of the roundworm to develop chemicals that could target just those genes—killing the creature without impacting the soil, other wildlife or farmers.

"The products to kill parasitic roundworms are problematic because they lack specificity in their activity," Rapp said. "They can harm the environment, or the grower, or any organism that comes into contact with it. We're taking the knowledge of the nematode to focus on the parts of the genome of the roundworm that are unique to it so we can find ways to kill nematodes without the harmful impacts on other parts of the environment."

The company's work is mostly focused on developing targeted chemical pesticides and nematode-resistant crops, with a product expected to reach the market in several years. A more immediate market for Divergence is drugs to treat animals or people infected with parasites, river blindness and elephantiasis. Rapp said a product could reach the market in two years.

Parasitic roundworms cause an estimated $80 billion in crop damage annually across the globe. Divergence estimates the market for nematocides is between $700 million and $1 billion each year worldwide—a fraction of the overall $8 billion worldwide insecticide market.

"There's a gap because limitations exist in the market at this point," Rapp said. "The market is very poorly served by the products available today. There hasn't been a product to market with a new mode of action since at least the 1980s, and a number of the products have been pulled from the market for toxicological concerns."

The company has raised $21 million in equity. The Series C round was led by MidPoint Food and Ag Fund and included 41 investors, such as Prolong Ventures, William Blair & Co., and the company's board of directors.

Divergence has also raised more than $2.5 million in Small Business Innovation Research grants from the National Science Foundation, National Institutes of Health and U.S. Department of Agriculture.

Chief Scientific Officer Jim McCarter began genome-sequencing nematodes in 1999, leading to the technology now being developed by the company's 27 employees and contracted researchers.

The nematode has about 20,000 genes. About half correspond to mammals, eliminating those from being targets of the pesticide, Rapp said. A significant portion of the genes don't impact breeding or basic functions, leaving less than 5 percent of genes that can be targeted with Divergence's technology, Rapp said.

Divergence's pesticide is like traditional pesticides in that it's a synthetic compound. But Rapp said it's safer than traditional pesticides, as well as more effective and cheaper to make than biopesticides.

The efficiency of agriculture is essential because of several factors, Rapp said. The global population is growing and demanding greater amounts of food, despite a relatively flat availability of arable land. Additionally, the booming biofuels market is putting pressure on agricultural efficiency, both on crops such as corn for ethanol and nonfood next-generation biofuel feedstocks such as switchgrass (see Sandia Lab predicts biofuel viability with new forecasting model). And there are increasing concerns about chemical runoff from traditional pesticides (see Don't let the bedbugs bite).

"We have no choice but to find ways to dramatically increase the productivity of each acre of farmland in the world," Rapp said. "There's a greater recognition of that need now than I have seen since I became involved in agriculture more than 20 years ago."

The same demand for productivity is driving the market behind Vancouver-based CellFor, which develops crops and medicine.
Tom Urban Sr., who sat on the board of directors of Divergence, is the father of Cleantech CEO Tom Urban.

The same demand for productivity is driving the market behind Vancouver farmland in the world," Derek Rapp said. "There's a greater recognition of that need now than I have seen in the market for Divergence. The company is mapping the genomes of the roundworm nematode infestations. The team has also developed disease-resistant, high yield tree seedlings (see CellFor grabs $10M for improved tree seedlings).

Unlike traditional pesticides, Divergence's pesticide is like a synthetic compound. But Derek Rapp said the technology is safer, as the modes of action since at least the 1980s, and a number of the products have been pulled from the market for being targets of the pesticide, Rapp said. A significant portion of the genes don't impact breeding or natural chemicals.

The team holds 16 issued patents and has more than 40 pending. The company also received a fraction of the overall $8 billion worldwide insecticide market.

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