

Local resources to international products

Could the cure for cancer be lying in the mud on the ocean floor off Atlantic Canada?

By Darcy Rhyno



Dave Overy and Brad Haltli laugh when I ask what they're looking for in the waters off Atlantic Canada. Their answer does nothing to conjure the romanticism of the sea. These two research scientists, working out of the Nautilus Biosciences lab at the National Research Council (NRC) in Charlottetown, are after the most defenceless, unappealing of all marine organisms — bacteria and fungi. Overy and Haltli find them on immobile marine creatures like sponges, corals, tunicates and sea anemone. They even welcome a good look at driftwood and mud.

"Typically," explains Haltli, "these organisms develop a chemical means to protect themselves, and we can exploit that for human purposes." He's the bacterial natural products group leader while fellow senior scientist Overy heads up research into fungi. Both work in the lab of Dr. Russell Kerr, founder and co-owner of the company, where — in partnership with the Uni-

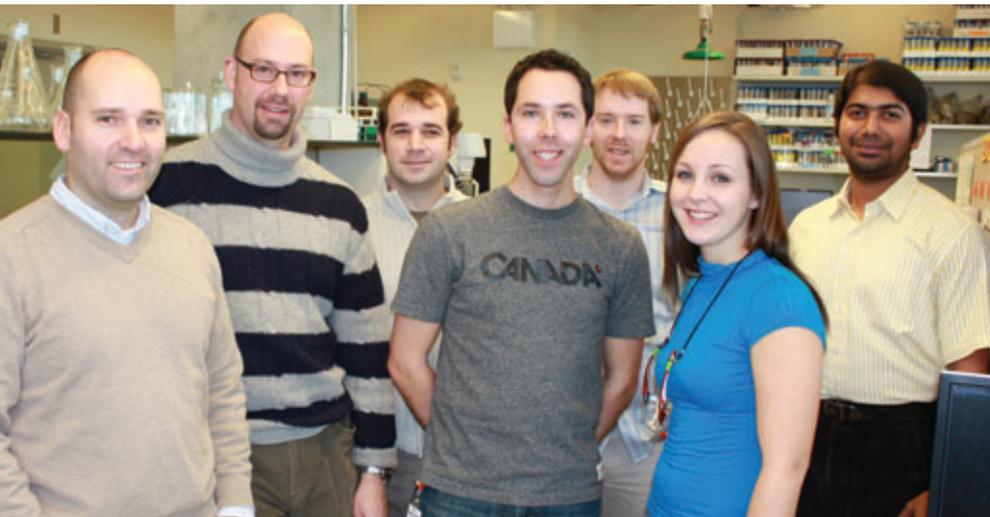
versity of PEI — they conduct research and oversee graduate students. "There's a lot of structural similarity between compounds produced by bacteria and fungi and those isolated from corals, sponges and other invertebrates. This intense similarity has led the natural products community to believe it may be symbiotic bacteria or fungi that are actually producing these (compounds)."

Founded in 2007, Nautilus is a new player in the field of bioscience. As yet the company hasn't produced a cure for cancer or even baldness. In fact, it has no products whatsoever and therefore no revenues, but it nevertheless belongs to P.E.I.'s successful and growing bioscience sector, one with the potential to be a major player in the world of natural products.

A cluster of companies, financial institutions, government agencies and academic partners came together six years ago to form the PEI BioAlliance and represent the interests of a sector with \$80 million in annual

sales. Within this sector, Nautilus belongs to a sub-sector that uses natural products from P.E.I. and around Atlantic Canada as the raw material for the manufacturing of high-tech products.

Member companies using natural products include Nature's Crop, a pharmaceutical and nutritional company specializing in non-genetically modified plant oils that just opened a new extraction facility in Kensington. Island Abbey Foods is researching how Island honey can be used as a drug delivery substance (they already make their own throat lozenges). Hendrick Seeds is growing soybeans with traits of particular interest to Japanese and European markets. The Ontario-based company is building its own research facility and will be contracting 40,000 acres for soybean production on the Island. Ceapro, a manufacturer of active ingredients for personal care and cosmetic products, is new to P.E.I. Speaking from his office in Edmonton, Ceapro's chief financial



ABOVE: Nautilus Biosciences staff at the NRC research lab in Charlottetown, P.E.I.: (l-r) Brad Haltli, senior scientist; David Overy, senior scientist; Fabrice Berrue, senior scientist; Nick McCarville, technician; Josh Kelly, technician; Jillian MacAulay, technician; and Atman Das, technician.



LEFT: Sediment from Great Slave Lake containing a variety of bacterial species. The colony with the grey, powdery looking surface in the upper right part of the plate is a species of *Streptomyces*. Photos: Darcy Rhyno

officer Branko Jankovic says his company is collaborating with the National Research Council and the Food Technology Centre on an oil extraction project. They're also collaborating with Agriculture and Agri-Food Canada's P.E.I. field research site at Harrington Farm to test a special variety of spearmint to see how it will grow in P.E.I. "Great first year results," reports Jankovic.

Dr. Regis Duffy is considered the founder of P.E.I.'s bioscience sector. Born in Kinkora (between Summerside and Charlottetown), Duffy returned to the Island after studies in the U.S. to become the first dean of science at the University of PEI. In 1970, he created Diagnostic Chemicals Limited, a company that would prove to be the Island's sector pioneer. It has since split into two companies. BioVectra is wholly owned and operated in P.E.I. while multinational biotech corporation Genzyme purchased the other arm of the company, which it continues to operate on the Island. Dr. Duffy is still with BioVectra as chairman.

Forty years after Duffy started the Island's first bioscience company, Rory Francis, executive director of the PEI BioAlliance, says there has been significant progress. "The ability to attract and retain high quality people in business and in govern-

ment. The fact that we're 30 companies now, the growth in revenue, the number of companies moving products to market.... And the commitment to research and development. The quality of the infrastructure with the NRC, the quality of the partnerships — research and academic, business and the provincial government. These are all signs of success."

One of the most important sector accomplishments is the construction of a \$30 million BioCommons Park across the street from West Royalty Business Park on the edge of Charlottetown where BioVectra and Genzyme currently run their operations. Premier Robert Ghiz characterized the BioCommons as the crown jewel of a \$200 million Island Prosperity economic action plan unveiled by his government in 2008. He predicts the park will attract research companies from around the world to join the bioscience cluster already operating on the Island.

Rory Francis of the PEI BioAlliance says the BioCommons, "is another important enabler to attracting businesses and growing businesses in PEI. The West Royalty Industrial Park was full. The NRC research incubators are full. We need world-class facilities because the competition is global.

These companies have to be global on day one."

Still, the BioCommons cannot take the sector into the future on its own. "It's like pieces in a bridge," says Francis. "Companies need top-notch facilities. But access to capital is also important. Access to human resources, access to science and technology are important. The BioCommons is a critical part, but you need them all to get across the bridge."

With the BioCommons under construction, the PEI BioAlliance is looking for new markets and developing new partnerships. In December, Trade Team Prince Edward Island (TTPEI) and the PEI BioAlliance worked with seven bioscience companies to organize a trade mission to the United Kingdom. Five mission members presented at two bioscience conferences, including Genesis 2010, a major British biotechnology networking conference.

According to Francis, the mission included a focus on natural health products like cosmetic ingredients, nutritional supplements and other health products developed from plants and marine sources. "This mission allows us to further build our relationships with business partners that represent important routes to European markets for products being commercialized in PEI," says Francis.

Back at the Nautilus labs in the NRC building, the work in natural products of Brad Haltli and Dave Overy will undoubtedly benefit from such missions, as awareness of what P.E.I. has to offer increases and as partnerships are formed. Haltli and Overy have amassed a bank of close to 3,000 bacteria and fungi, any number of which could lead to the development of marketable products. "We've only scratched the surface," asserts Haltli. "A student was looking at bacteria from sediments from New Brunswick and Newfoundland. We probably found 500 to 600 unique bacteria. We're very optimistic that continued sampling around Atlantic Canada will yield more biodiversity."

"I'd love to cure cancer," says Haltli. But he's realistic. "Even if you did find something, it's 15 years before you see it applied. I'm really excited about our potential to find things that may incrementally improve people's lives. If we found something that, for instance, helped combat dandruff, it's not a huge thing, but we would be helping people's quality of life. We could actually see that taken to market in two to five years." And if this dynamic duo can help pull off a couple of such applications, Nautilus might just become the next in a 40 year string of successes. IABM