

# Biotechnology

## WEEK

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**Current predictions for the size of the global bioeconomy market in the year 2020 range from a conservative \$700 billion to many trillions of dollars. This dramatic growth will be driven by a combination of powerful market drivers, advances in enabling technologies, and government support. With the biosciences sector promising skilled, innovation-based jobs building on New Brunswick's abundant renewable natural resources, and with the province's existing strengths in the biosciences and in innovative capacity, the biosciences sector would seem a priority target. Indeed, the bioeconomy has been identified a key pillar in New Brunswick's self-sufficiency plan, and marries well with Canada's Science and Technology Strategy.**

### Genomics the key to much of the biotech world

When we think of genomics, we often think of human health research and mapping the human genome.

But the value of genomics research extends a lot further than that.

"If it has DNA, it's a candidate for research," says Dr. Steve Armstrong, President and CEO of Genome Atlantic, the centre responsible for enabling large-scale gene discovery research in the region.

"So many of the big drivers of economies are based on living things and processes that can be optimized using genome research," says Armstrong. "From forest management, to the development of novel potato varieties or elite aquaculture broodstock, to algae-based biofuels ..... **as we understand more and more about genetic blueprints, the greater our potential opportunities will be.**"

Genome Atlantic is currently working on two multi-million-dollar genomics research projects, both launched in 2006; one in health, and the other in cod. The latter is a response to the region's attempt to make cod a part of the Atlantic experience again, through a vibrant aquaculture industry.

**"We're figuring out which genes are associated with the traits that will help cod thrive in an aquaculture environment to provide a competitive advantage to our regional companies."**

The organization will launch another aquaculture project in the next few months, funded primarily by ACOA, which will capitalize on the findings from the initial cod genomics project, and take it even further to help the local industry.

On the human health side, Genome Atlantic's Atlantic Medical Genetics and Genomics Initiative has been looking for the genetic causes of nearly 30 monogenic disorders in the region. Several New Brunswick families and many others from Atlantic Canada have been part of the research, and have gained new information about mysterious diseases that have

run in these families for years.

**"Each finding in human health adds another piece to the master puzzle,"** says Armstrong.

Even if a disease only affects a small number of Atlantic Canadian families, the findings surrounding the genetic mutation responsible for that disease can tell us a lot about the human body in general.

Two findings in the last few months alone are examples of that. One, a gene associated with a rare, but serious form of anemia, has us rethinking the way our bodies process haemoglobin. A second is a gene associated with a unique disorder that makes the skin of young people appear wrinkled and aged. This gene is showing potential to help us understand the skin aging process.

Genomics also promises to help address global environmental issues; everything from environmental cleanup of oil and other substances, to finding new energy sources.

"Right now, the rush is on to find a sustainable alternative to traditional oil supplies," says Armstrong. **"Genomics research in the grain, camelina, and microalgae, indicates great potential for these to be used as sources of biofuel."** The associated industry that could be developed in the region would be of astronomical value for Atlantic Canada.

Armstrong says the primary obstacle to companies incorporating genomics knowledge into product development boils down to one thing; understanding.

**"If we don't quickly comprehend the potential for genomics knowledge to transform many aspects of the human health, forestry, energy, environment and aquaculture sectors, some other country or region will, and we'll be left buying their products, instead of creating them here in Atlantic Canada."**

But it's that understanding that Armstrong says is the toughest to overcome.

"How a company could incorporate genomics knowledge into product development isn't a



**Dr. Steve Armstrong**  
President & CEO, Genome Atlantic

topic one can adequately explain in a couple of powerpoint slides."

But he is determined to work with the region's exceptional genomics experts to explain the outstanding results that are already being achieved, and to help people see the potential that lies ahead.

**"Once people see the ROI for the genomics research that is being done here, they will undoubtedly understand how an ongoing investment in genomics is crucial to our region's economic well-being."**

A Special Advertising Feature of the **TELEGRAPH-JOURNAL**

### WHAT DO



### HAVE IN COMMON?

Gene research touches almost every part of our lives.

Sometimes, it helps us better understand fish, which leads to healthier solutions for aquaculture producers.

Sometimes, it brings more accurate diagnoses for things like heart disease, and more powerful, cost-effective treatments.

And sometimes, it reveals more earth-friendly ways to harness our natural resources for things like biofuel.

Genome Atlantic is proud to be a part of the gene research that is creating the very foundation of the vibrant life sciences sector in Atlantic Canada.

Learn more about our research at [www.genomeatlantic.ca](http://www.genomeatlantic.ca)



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**Institut de recherche  
sur les zones côtières inc.**  
**Coastal Zones  
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**Coastal Zone Research Institute,** located in Shippagan serving all New Brunswick, is developing new technologies that will allow for the extraction, isolation and characterization of bioactive ingredients from marine by-products to create value-added products for aquaculture, natural health product and food markets.

**We are proud to participate in the New Brunswick biosciences network improving the environment and building economic prosperity.**



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