



TOP 10 WAYS ATLANTIC CANADA CAN LEAD WITH GENOMICS



Steve Armstrong, PhD, President & CEO, Genome Atlantic

On October 14th, we joined the region's industry leaders to discuss key business issues at the Top 101 CEO Summit, presented by Progress Media.

Genome Atlantic's Chairman of the Board, Eric Cook—an active voice in the national innovation community—participated in a lively panel discussion on leadership. Eric, President and CEO of RPC in Fredericton, a not-for-profit contract research organization, delivered a passionate case for companies to show leadership through the use of innovative technologies, like genomics.

He pointed to the region's abundant natural resources, and our diverse research capacity that is ready and able to make our land- and water-

based riches even more valuable. (See more on genomics and natural resources inside.)

The Top 101 event started us thinking about our own list: the top 10 ways that our region can benefit from genomics. Enhanced extraction in mining, more cost-effective bioremediation, corrosion management in the offshore oil space...there are endless opportunities for genomics to provide real, bottom-line improvements to Atlantic Canada's key industries. (You can see the full Top 10 list in the booklet we've included.)

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But as Eric pointed out, it will take strong leadership from companies to identify these opportunities and to take the steps to make them happen.

Luckily, those companies are not alone. We are fortunate here at Genome Atlantic to partner with some key institutions in our quest

to help these companies. The universities, the National Research Council of Canada-Industrial Research Assistance Program, the Atlantic Canada Opportunities Agency and various provincial organizations and departments have collaborated to support these companies in the pursuit of genomics-enabled innovation.

There is strong momentum building. We are grateful to be part of it, and encouraged by those who join us in this incredibly important endeavor for Atlantic Canada.

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HELPING INDUSTRY LEVERAGE GENOMICS

Genome Atlantic is actively engaged in efforts to help Atlantic Canadian companies and organizations implement genomics-based technologies to improve sustainability and competitiveness. We do this through a variety of funding programs, including:

Genomics Opportunity Review The Genome Atlantic Program provides up to \$15,000 to support applicants in the identification, development and/or adoption of genomics tools that lead to increased productivity, profitability and sustainability.

Genomic Applications Partnership Program The Genome Canada Program is designed to fund projects that address real world challenges and opportunities in the field of genomics. Funds from Genome Canada range from \$100K to \$2M to be matched on a 1:2 ratio by other partners.

Large Scale Applied Genomics Research Project Competitions These Genome Canada competitions were developed to support world-class 'omics R&D projects. The sector focus and partners change per competition, but the objective is always to drive cutting edge R&D that can benefit industry.

Other Industrial Funding Opportunities Genome Atlantic regularly works with companies to help them pursue genomics R&D through funding from organizations such as ACOA-AIF, NSERC, NRC-IRAP, Mitacs and others.

If you are interested in how we can work with your company or organization, please contact us.

GENOMICS IN NATURAL RESOURCES

Most of us are familiar with the concept of genomics in sectors like healthcare, aquaculture and agriculture where the DNA of living things can be studied and explored. But many are foggy on how genomics can help in natural resource-based sectors like energy and mining.



The answer is simple; these sectors are full of invisible organisms like microbes and bacteria that can have huge impacts on these industries.

In mining, for example, microbes can help with the extraction of some low grade ores and even gold, while reducing the need for water usage and chemical inputs. Genomics helps us understand those microbes so we can better utilize their rock-eating tendencies.

In the oil and gas sector, microbes can contribute to the serious and costly issue of corrosion. Genomics can provide insights into these microbial communities, and help us manage the

environment to mitigate the corrosion-causing organisms.

In both sectors, certain microbes can help with clean-up by 'eating' chemicals that are otherwise toxic, and releasing benign substances in their place. The Deepwater Horizon oil spill in 2010 provides a great example of naturally-occurring microbes performing this important bioremediation service. Genomics is helping us get to the bottom of these powerful environmental helpers so we can maximize their role in other industrial sites.

The use of genomics within the natural resource space is somewhat early, yet companies around the world are making great strides in their development. For example, BioSigma in Chile is well-known for their efforts around copper extraction, and the Talvivaara Mining Company in Finland is using similar bioleaching technologies for nickel.

Here in Canada, consulting companies like Hemmera in BC are working on environmental monitoring and bioremediation tools that are based on genomics technologies.

While the connection between genomics and natural resources may not be instantly recognizable, it's clear that the opportunities for efficiencies, cost-savings and increased sustainability are real. We look forward to working with industry and research partners to create some 'made in Canada' solutions for this vital part of our economic and ecological landscape.

Note: We are happy to host Hemmera's Scott Weston and other national experts at regional mining, energy and environment conferences this fall. See back for details.

ATLANTIC CANADA RECEIVES \$7.6M FOR TWO NEW AQUACULTURE PROJECTS

Two new genomics projects will help aquaculture companies compete globally through improved feed and enhanced fish health. The two projects were among 12 to receive funding through Genome Canada's new Genomic Applications Partnership Program (GAPP), which supports industry-academic R&D initiatives.

This is great news for the region," says Dr. Steve Armstrong, President and CEO of Genome Atlantic. "It's a clear example of how genomics can provide innovative solutions to some of our most important industry challenges."

TWO NEW GENOMICS PROJECTS WILL HELP AQUACULTURE COMPANIES COMPETE GLOBALLY

Cooke Aquaculture Inc., Kelly Cove Salmon and the University of Guelph are combining genomics tools known as SNP chips with traditional breeding practices. This will allow Cooke to select for salmon that have better



Keng Pee Ang, PhD

flesh quality and are naturally more resistant to parasites and disease. The \$3.8-million **Salmon and Chips** project is co-led by Cooke's Keng Pee Ang, PhD, and Elizabeth Boulding, PhD, from the University of Guelph.

In the second project, **EWOS Innovation, the R&D arm of EWOS, the world-leading fish feed producer, and Memorial University** are working to develop improved aquaculture feed formulas that use fewer marine-based products and lead to healthier fish. Memorial's Matt Rise, PhD, will co-lead the \$3.8-million, **Biomarker Platform for Commercial Aquaculture Feed**

Development with Richard Taylor, PhD, from EWOS Innovation. The project will use genomics technologies to assess the effects of various diets on fish health at the molecular level. The highly-detailed information will help EWOS Innovation fine-tune formulas that include non-marine products and develop clinical feeds that will combat disease.

Genome Atlantic congratulates these teams on their success in what was a highly competitive national selection process.

NEW BUSINESS DEVELOPMENT OFFICER



Genome Atlantic is pleased to announce the newest member of the team, Kristin Tweel, PhD, MBA. As Business Development Officer, Kristin will be an important part of our efforts to help the region benefit from genomics.

Kristin is passionate about seeing science in action. She will work closely with industry to help them connect with genomics expertise to tackle challenges and embrace opportunities

within the environment, mining and health sectors.

Kristin obtained her Doctor of Philosophy in Pharmacology from Dalhousie, and an MBA from Saint Mary's University. She has been active in the regional biotech community, most recently working in her home province of PEI with BioVectra where, among other things, she developed an evaluation model to assess risks and opportunities for generic drug development.

HEALTH SEMINARS



We've just started our 3rd season of the **Genetics and Genomics Lunch Series**, designed to increase understanding of the role of genomics in human health, and create awareness of best practices, new findings and research that may provide benefit to patients.

Topics include challenging clinical and research results, policy and ethical issues, and technological developments. The sessions are open to clinicians, researchers, health managers and those in policy development.

We kicked the season off with Dr. Paul Lasko, **CIHR (Institute of Genetics)** Scientific Director, who discussed his efforts with the International Rare Diseases Research Consortium. Other presenters will include Dr. Robert Burgess from the **Jackson Laboratory**, Dr. Ronald Cohn from **The Hospital for Sick Children**, and Durhane Wong-Rieger, PhD, from the **Canadian Organization for Rare Disorders**. Local presenters include Matthew Herder, JSM, LL.M., Dr. Michael L. West, Dr. Louise Parker, and recent recipient of the 2013 Gerhard Herzberg Canada Gold Medal for Science and Engineering, Ford Doolittle, PhD.

The sessions are made possible by the Government of Canada through Genome Canada and Genome Atlantic, as well as the IGNITE Project (Orphan Diseases: Identifying Genes and Novel Therapeutics to Enhance Treatment).

For the complete schedule and dates and times, or to view videos of past seminars, please visit humangenomicsatlantic.com

GENOMICS: THE POWER AND THE PROMISE

Leaders from government, industry, academia and the innovation community will see how genomics is providing solutions to some of our biggest challenges.

Genomics: the Power and the Promise will take place November 24-26 in Ottawa, and is expected to draw over 300 people from Canada and beyond.

The conference will bring together the world's top minds in the field of genomics to explore how environmental factors can impact our health and our natural resources, including mining, energy and forestry.

Featured presentations will focus on topics such as the impact of climate

change on our forests, and harnessing microbes for bioremediation. The conference will also look at genomics and health with presentations on: the human microbiome; epigenetics, epigenomics and cancer; and neurogenomics.

For more information, visit the conference website: powerandpromise.cvent.com/2014



ON THE ROAD

The main goal of Genome Atlantic is to help the region benefit from genomics. A key strategy is to work with industry and other organizations to help them identify and pursue opportunities to implement genomics into their business. Here are some of the ways we're engaging with industry this fall:

- Presented at the NewLeaf Conference in St. John's (environment), Oct 9-10
- Hosted presenter, Tom Jack, PhD, of University of Calgary, at the NACE North East Conference (Corrosion) in St. John's (oil and gas), Oct 18-20
- Attended BioPort in Halifax (biosciences), Oct 21
- Hosted presenter, Scott Weston, MSc, PGeo, of Hemmera, at the Atlantic Reclamation Conference in Wolfville (environmental services), Oct. 29 - 30

- Hosting presenter, Lesley Warren, PhD, of McMaster University, at the Mining, Petroleum and Exploration New Brunswick in Fredericton (mining and energy) – Nov 3
- Presenting at the Mineral Resources Review Conference in St. John's (mining), Nov 6-8
- Hosting presenter, Elizabeth Edwards, PhD, of University of Toronto, at Geology Matters in Halifax (mining), Nov 13

Contact us to learn more or to suggest other opportunities to connect industry with genomics expertise.



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