



ANNUAL REPORT 2015-2016



GenomeAtlantic

Life Sciences. Life Solutions.

Genome Atlantic is a not-for-profit corporation with a mission to help Atlantic Canada reap the economic and social benefits of genomics and other 'omics technologies. Working with a broad range of partners, we help companies, genomics researchers and others collaborate around strategic R&D initiatives that create sustainable improvements in agriculture, aquaculture and fisheries, energy, the environment, forestry, human health and mining.

Supported by the Government of Canada through Genome Canada, as well as the Atlantic Canada Opportunities Agency and the National Research Council of Canada – Industrial Research Assistance Program, and partnering with other government, industry, academia and research institutions, Genome Atlantic has enabled over \$75 million in genomics R&D throughout Atlantic Canada.

Genomics is the powerful combination of genetics, biology and computer science that helps us unlock the information found in the DNA of all living things.

By unlocking the code of life, genomics can lead to new solutions to challenges in a range of areas, including:

- **ENERGY** Using genomics to look at the DNA of the microbes involved in key industrial processes, we can find solutions for issues such as corrosion, oil clean up and exploration.
- **MINING** Genomics helps us understand the microbes involved in increased recovery and bioremediation at mine sites.
- **FORESTRY** We can use genomics to improve our understanding of trees, pests and disease for stronger and more sustainable forests.
- **ENVIRONMENT** Genomics can help us increase the accuracy and efficiency of monitoring and bioremediation practices.
- **FISHERIES & AQUACULTURE** We can use genomics to look at the DNA of both wild and farmed species to inform and improve management practices.
- **AGRICULTURE** Using information from genomics, we can improve productivity, reduce costs and increase sustainability.
- **HEALTH** By studying the human genome, we gain insights that can lead to more targeted and precise approaches to diagnosis and management of a range of diseases.

2015-2016 OPERATIONAL GOALS

Genome Atlantic's efforts in 2015-2016 represent Year Two (Y2) of a three-year plan that endeavors to help Atlantic Canadian companies leverage the transformative power of 'omics for increased innovation, profitability and sustainability.

Specifically, Genome Atlantic's three-year plan aims to enable:

- \$17 million in new 'omics R&D investment in Atlantic Canada
- 130 person years of employment
- Business Expenditure on R&D (BERD) of \$4.7 million

The Three-Year Plan Has Annual Deliverables Designed To:

- Develop a robust pipeline of end-user-driven opportunities
- Improve the ability of both small- and large-scale emergent proposals to compete at the regional, national and international levels
- Ensure funded projects create optimum value for the proponent by being executed within the framework of a comprehensive project management paradigm

Y2 GOAL

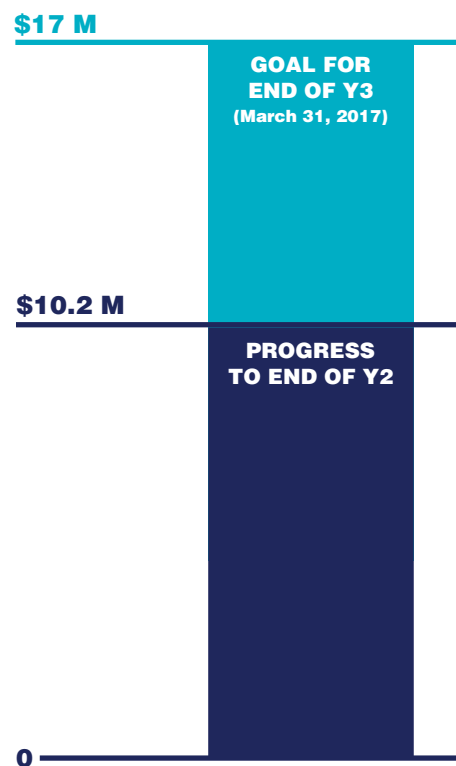
Competition for 'omics R&D funding is fierce. In order to achieve the \$17 million in new 'omics R&D investment, Genome Atlantic has to support a large number of proposals. The goal for Y2 was to support the development of nine proposals with a total budget of \$11 million.

Genome Atlantic exceeded this goal with support of 16 proposals worth \$18.5 million. **More importantly, six of those proposals were funded, successfully achieving 46% of the total proposal value, which translates to \$8.6 million in new 'omics R&D for the region.**

This end result, combined with new R&D from Y1, puts Genome Atlantic in a favourable position to meet its three-year goal of \$17 million.

Genome Atlantic also exceeded all other operational deliverables as outlined in the next two pages.

FIGURE 1: Progress Toward Three-Year Goal of \$17 Million in New 'Omics R&D in Atlantic Canada

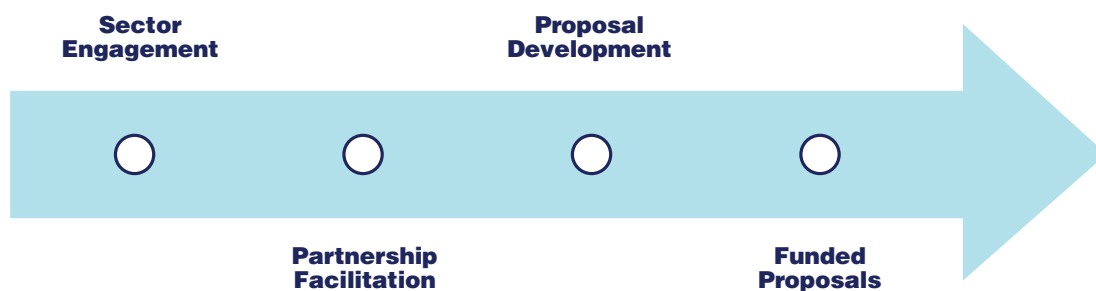


THE OPPORTUNITY DEVELOPMENT PROCESS

Developing proposals is a key component of what Genome Atlantic does. But it's actually the result of many previous steps that begin as early as 24-36 months before. We start with Sector Engagement; strategic contact with companies or select government end-users about genomics and the ways it may benefit them. Then we proceed

to targeted Partnership Facilitation; initiatives designed to create and foster collaborative relationships between academia and industry/government end users. If there is viable potential for genomics R&D, we allocate resources to Proposal Development; quarterbacking the many experts and steps required to compete on the regional, national or global stage. From there, we hope for Funded Proposals.

FIGURE 2: Opportunity Development Process



GENOMICS OPPORTUNITY REVIEW PROGRAM

One of the tools we use to develop prospective solutions is the Genomics Opportunity Review Program. It provides up to \$15,000 for initiatives that help companies or select government agencies evaluate the ROI of a potential genomics-based approach to a problem. The goal of the program is to provide information that can help the proponent decide whether or not to pursue future investments.

In 2015-2016, Genome Atlantic approved seven applications (exceeding our goal of three) for the

Genomics Opportunity Review Program. These projects ranged from looking at the feasibility of using genomics to improve bioleaching of refractory gold tailings in Newfoundland and Labrador, to helping a Nova Scotian food producer assess the potential of genomics-based approaches to enhancing product nutrients.

When the projects show that the potential ROI of additional R&D is positive, Genome Atlantic continues to help the proponent with the next steps of pursuing a genomics-based approach. This usually takes the form of developing a proposal. But findings that indicate negative or negligible ROI can be valuable too. Although disappointing, it's helpful for the proponents (and potential funders)

to avoid the long and resource-intensive process of large scale proposal development and R&D.

SECTOR ENGAGEMENT In 2015-2016, Genome Atlantic participated in 15 select sector events

15

(exceeding our goal of six) with the goal of connecting with industry and introducing the potential of genomics. We also arranged for six genomics experts (exceeding our goal of

four) to present on their use of genomics to solve industry problems. Memorial University's Helen Zhang, for example, joined us at RemEAST to explain how genomics is enabling biosurfactant-enhanced soil remediation. Some of these presentations have led to follow-on pursuits between the expert and local companies and other stakeholders.

In addition, we also commissioned a report on the use of genomics within the environmental monitoring space, which can be applied in the aquaculture, energy, mining and other sectors. This has opened up a number of opportunities in all of these sectors.

PARTNERSHIP FACILITATION In 2015-2016, Genome Atlantic supported 10 initiatives

10

(exceeding our goal of three) designed to foster collaboration between academic researchers, companies and other stakeholders. These

activities ranged from inviting a representative from a multinational company to meet with local researchers about potential R&D needs, to conducting a national workshop on the use of genomics in apple breeding. Many of these events have led to follow-on initiatives, such as the development of proposals or further exploration.

PROPOSAL SUPPORT In 2015-2016, Genome Atlantic supported the development of 16

16

proposals (exceeding our goal of nine) valued at \$18.5 million. The proposals address a range of challenges such as gastrointestinal conditions in human health, to

environmental monitoring in marine environments, bioremediation of abandoned mining sites, offshore oil exploration, and oyster hatcheries.

ACTIVE PROJECTS

There are currently over \$17 million (\$7.6 M procured prior to the Three-Year plan, and \$10.2M since) in active 'omics R&D projects in Atlantic Canada that were supported by Genome Atlantic's programs and services along with our key partners such as Genome Canada, ACOA-AIF, NSERC and NRC-IRAP. They use genomics to solve a number of industry and healthcare problems, including:

- Breeding and feed programs in the salmon aquaculture space
- Improving offshore oil exploration
- Developing an oyster hatchery
- Bioremediation using biosurfactants
- Understanding GI conditions such as irritable bowel syndrome
- Bioremediation of abandoned mine sites
- Leveraging microbes for environmental monitoring

EDUCATION, OUTREACH AND GENOMICS IN SOCIETY

Genome Atlantic also looks for opportunities to engage with broader audiences about topics related to genomics. Along with keeping our elected officials and funding partners apprised of current and prospective opportunities within the Atlantic region, and liaising with the media, we also supported the following initiatives:

SEMINAR SERIES

The Human Genetics and Genomics Seminar Series just completed its 2015-2016 season. The Series was developed as part of a knowledge translation component of the IGNITE Project (Orphan Diseases: Identifying Genes and Novel Therapeutics to Enhance Treatment). The caliber of the speakers and range of topics has drawn a steadily-growing audience and garnered Continuing Medical Education (CME) status. Now in planning for its 5th year, the Series has become a central focal point for discussing genetics/genomics within the local health care community. The Series is currently funded by Genome Atlantic and the IWK Department of Pediatrics.

VIDEOS

Genomics is a complex technology. Unlike say, computers, it can be hard for some to imagine how genomics can solve industry problems. In an attempt to help more people see the value

and potential of genomics, Genome Atlantic spearheaded a set of videos that illustrates how this powerful tool is being used in seven key sectors.

The videos are now reaching audiences across the country through our partnership with Genome Canada and the other five Genome Centres. In addition, we also worked with Genome Canada to develop a heart-warming video about some previous genomics work conducted in Newfoundland and Labrador. The video powerfully outlines the search for a deadly genetic mutation and the lives that were saved by the discovery. We encourage you to view all of these videos on our website in the Sectors section.

GMOS AND POVERTY CONFERENCE

Genome Atlantic and Genome Canada partnered to support a public lecture and conference on the use of genetically modified organisms in sub-Saharan agriculture. The event attracted scholars from the humanities and agriculture, as well as NGOs and government. The discussion provided an opportunity for debate of the benefits and hazards of integrating this type of technology into third world food systems. The key deliverable of the event was a policy brief written by Matthew A. Schnurr (Dalhousie University) and Stuart J. Smyth (University of Saskatchewan), which can be found on our website.

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* Financial Statements available on our website.

** Documents available in French upon request.

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