



# Bridging the divide

Creating opportunities for the Aboriginal Peoples of Canada to enter the bio-economy

A report from BioTalent Canada



Building skills for Canada's bio-economy



Areas of opportunity in the emerging bio-economy extend from agriculture and forestry to human health and life sciences. What they have in common is their potential to improve quality of life and contribute to prosperity across the country—including the communities of the Aboriginal Peoples of Canada.

A ready supply of skilled, qualified talent is essential for success. The Aboriginal Peoples of Canada could be an important part of that supply—but to become so they must have stronger encouragement to enter into the sciences, and be provided with a greater number of educational and occupational opportunities within their chosen fields.

BioTalent Canada is committed to bridging the divide: completing the connection between Aboriginal Peoples' potential and the biotechnology sector's need for talent.

An industry-led, not-for-profit organization, BioTalent Canada's role is to foster human resource development within the biotechnology sector. Since 1997, we have served as the direct link to a network of leaders in Canada's bio-economy—and are today the industry's trusted and comprehensive source for human resource information and skills development.

**The bio-economy involves the research, development, manufacturing and commercialization of technologies and products for such areas as:**

- |                |                 |                   |
|----------------|-----------------|-------------------|
| Agriculture    | Biosciences     | Life sciences     |
| Aquaculture    | Environment     | Medical devices   |
| Bioenergy      | Food processing | Natural resources |
| Bioinformatics | Human health    | Pharmaceuticals   |



Building skills for Canada's bio-economy



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*“I grew up on reserve, and like most people raised in the country, I love the beauty and dynamism of nature. After working in government in organizational development for many years, that interest in our natural world led me to undergraduate and graduate studies in biology, where science added a whole new dimension to the natural world I loved. Understanding the internal workings of plants and the complexity of their place in the environment only deepened my appreciation for the miracle of the natural world.*”

*Through my job at Natural Health Products Directorate in Health Canada, I get to work in the best of both worlds, integrating my lifelong fascination with plants with cutting edge scientific research in an environment that respects Aboriginal culture and acknowledges traditional medicinal use of plants.”*

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Valerie A. Assinewe, Ph.D.  
Unit Head, Monograph Development  
Bureau of Clinical Trials and Health Sciences  
Natural Health Products Directorate  
Health Canada

# Opening the door to opportunity



**Canada's bio-economy needs one thing above all else: talent. Qualified, well-trained, experienced professionals with the scientific spirit and entrepreneurial drive to pursue discovery and propel innovation. The Aboriginal Peoples of Canada have tremendous potential to contribute to the growth and diversification of the bio-economy. Yet opportunities must be actively created if that potential is to be realized.**

## An untapped source

Living in communities close to the resources needed for many types of biotechnology ventures, the Aboriginal Peoples occupy a position of great opportunity. Moreover, they want to be employed—and the biotechnology sector needs them. They want to strengthen their communities—and biotechnology has the potential to help them do so.

Yet while the Aboriginal Peoples of working age constitute the fastest-growing segment of the country's labour force, they remain underrepresented in Canada's bio-economy—and in the sciences more generally. Only 21 percent of biotechnology companies employ Aboriginal Peoples.

## Why is this so?

That question was posed in 1999 at the conference *Balancing Choices: Opportunities in Science and Technology for Aboriginal People*. Hosted jointly by the Department of Indian Affairs and Northern Development (DIAND) and Human Resources and Social Development Canada (HRSDC), *Balancing Choices* drew roughly 250 representatives from education, industry and government as well as youth and adults from First Nations and Inuit communities.

Delegates noted that while many similarities exist between labour market outlooks in communities of the Aboriginal Peoples and those in neighbouring regional and sub-regional economies, there are frequently also significant differences between them. In other words, the circumstances of the Aboriginal Peoples are distinct—and consequently any career outlooks prepared for them must take that distinction into account.

## Education is key

One of the primary objectives of the *Balancing Choices* conference in 1999 was to develop an action plan that governments, educational institutions, employers, parents and community members could implement to increase Aboriginal Peoples' participation in science and technology. The conference identified the need for action in four areas, all of which centre on education and training:

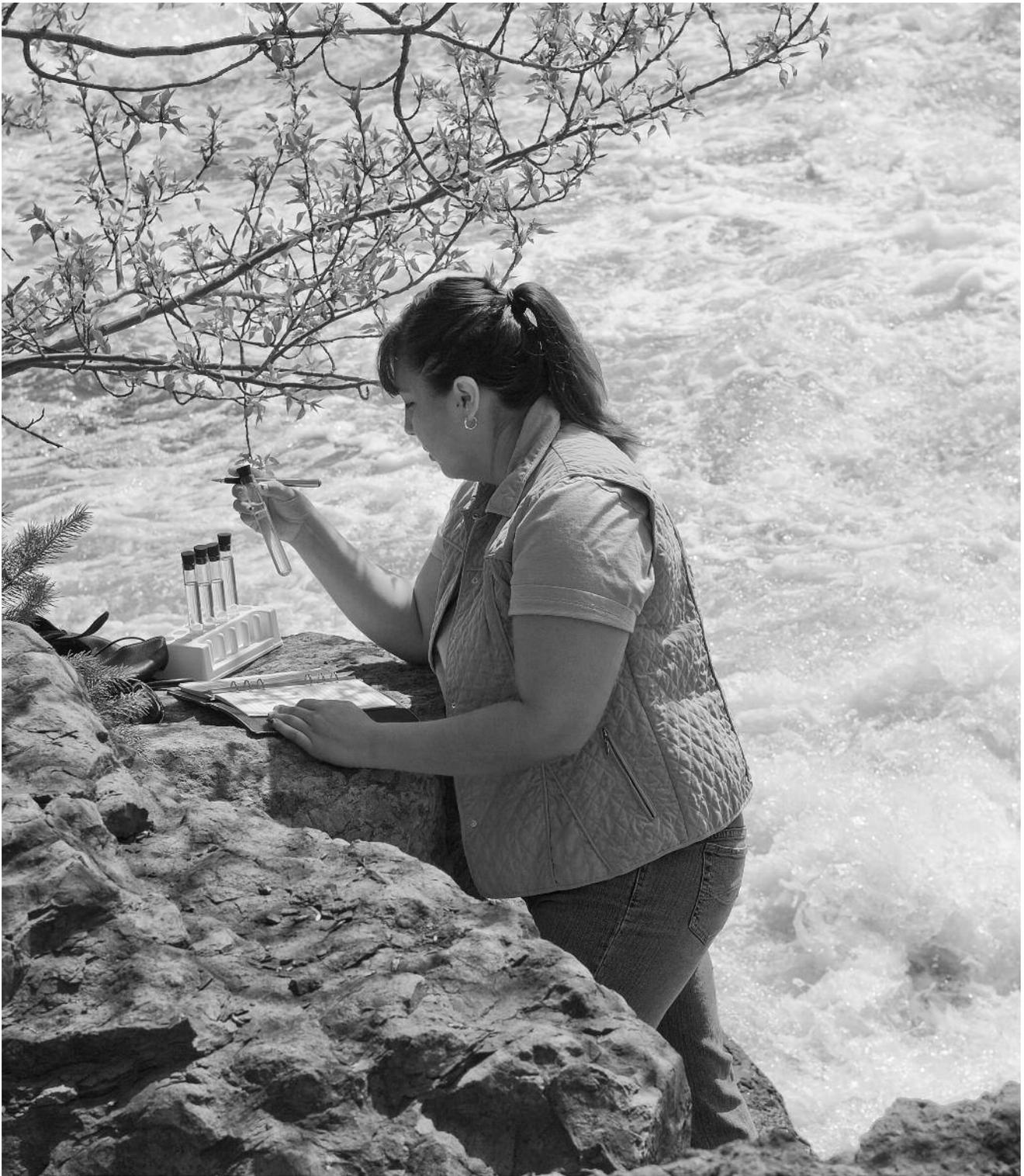
1. Research to ensure excellence in science education
2. Information about educational and career opportunities
3. Funding for science and technology education
4. Employment partnerships in science and technology

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*Only 21 percent of biotechnology companies employ Aboriginal Peoples. Increasing that percentage requires a focus on education, communication and partnership—creating employment opportunities for Aboriginal Peoples and raising awareness of those opportunities so that interested students can access and take advantage of them.*

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BioTalent Canada's recent studies of Aboriginal Peoples' participation in the bio-economy confirm that these remain priorities today. Fundamentally, awareness of science-related career opportunities must be raised among Aboriginal Peoples. Partnerships across all sectors of the economy and society are needed to increase Aboriginal Peoples' participation in Canada's labour force.



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*The bio-economy is rooted in science that engages directly with the real world—science you can touch. Researchers like the fourth-year Biology student pictured here go out into natural environments, studying and working with complex biological systems.*

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# Finding a place: The Aboriginal Peoples of Canada and the sciences



**Young Aboriginal Peoples today are typically unaware of how science and biotechnology affect their lives—and of the career possibilities open to them by pursuing scientific studies. The reasons for this are many: some cultural, some socio-economic, and some to do with the educational experience these youth receive today.**

It is well demonstrated that young people benefit from exposure to science. Early encounters can spark a lifelong interest that ultimately influences career choices.

Aboriginal Peoples working in science often affirm this by reporting that their interest was kindled through some form of early exposure: camps, community activities, family involvement, teacher encouragement or other personal experience. Yet for many of the Aboriginal Peoples' youth, such experiences are rare—if they happen at all.

## Formative influences

In 2008, BioTalent Canada surveyed the youth enrolled in post-secondary science studies as well as representatives from Aboriginal Peoples' organizations, post-secondary institutions and secondary schools across the country. It emerged unquestionably that role models are essential—and too few. Aboriginal Peoples' youth respond strongly to the influence and example of others who have gone before and shown by their experience what can be accomplished. If we are to encourage greater participation by Aboriginal Peoples in the sciences, such role models must be given prominence.

The surveys revealed clearly that young people's awareness of—and enthusiasm for—science is directly influenced by experience with science. And in many communities of the Aboriginal Peoples' where previous generations have not been involved in the sciences or provided with even a rudimentary scientific education, that awareness and enthusiasm is low.

## Desire to succeed

Among the most important influencers after parents are teachers. Educators play an enormously powerful role in helping students appreciate the broad spectrum of opportunities that exist in the field of science, especially during the sensitive and life-shaping pre-teen and teenage years.

Unfortunately, this is a difficult role. Teachers are already overburdened and those teaching science face the constant challenge of maintaining current knowledge of science-related issues. In general, the quality of Aboriginal Peoples' secondary-level education must be improved. Secondary-school completion rates among Aboriginal Peoples aged 20 to 24 living on reserve was 58 percent in 2001. For off-reserve Aboriginal Peoples, it was even lower: 41 percent. By contrast, the percentage of the non-Aboriginal population aged 20 to 24 years without high-school education was just 15 percent in the same year.

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*If we are to encourage greater participation by Aboriginal Peoples in the sciences, such role models must be given prominence. Educators in particular play a powerful role in helping students appreciate the opportunities in science, and to better understand how science affects their daily lives.*

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Teens on and off reserve are keen to complete their high school education. They view education as a gateway to employment and as an opportunity to obtain skills and knowledge that will allow them to give back to their community. What they need is increased assistance for teachers, interaction with more sophisticated classroom equipment and the chance to participate in science related events that will provide positive direction—allowing them to see how science affects their lives and exposing them to successful role models within the Aboriginal Peoples.



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*This young researcher is participating in scientific work to increase the yield of soybean plants, which have a wide variety of uses in the bio-economy from foods to alternative fuels. Biotechnology is an arena where scientific disciplines intersect—and where Aboriginal Peoples have the opportunity to play a key role by virtue of their proximity to the resource bases required.*

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# Looking to learn: Science education for Aboriginal Peoples



**Recent statistics show that some 22 percent of Aboriginal Peoples have completed their college or university education—a significant increase from decades past, yet one tempered by the fact that the gap in completion rates between Aboriginal Peoples and non-Aboriginal post-secondary students is growing. That gap is even greater where the sciences are concerned. Not only must we create more opportunities for Aboriginal Peoples youth to study the sciences, but we must also give them the tools to succeed.**

Today's youth within the Aboriginal Peoples must overcome a multitude of challenges in order to pursue higher levels of education and establish successful careers. Socio-economic realities present barriers to entry at the post-secondary level: the students lacking the necessary financial resources may have very few options. Support is essential.

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*"[Our schools] ignored subjects because they were optional. We did not even have a chemistry program. I did some schoolwork using a toy set. When I came to my university lab, others were experienced and I was not."*

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Focus Group Participant

Students who struggle at the post-secondary level often do so because of unpreparedness—returning us to the earlier point that the exposure to science education is critical. Students who enter college or university untrained for what they are about to encounter are likely to feel overwhelmed and discouraged—and ultimately withdraw.

As well, students at college and university can often suffer from feelings of social discrimination, isolation and loneliness. Family and community demands also create time restraints that make post-secondary education simply impossible for some.

## Breaking down the barriers

Supporting Aboriginal Peoples' completion of post-secondary schooling is beneficial to society as a whole, not just to the biotechnology sector. The Aboriginal Peoples who receive a diploma or degree are significantly less likely to face employment disparities when they enter the workforce. Education levels the playing field to a considerable degree.

## What are the issues that need to be addressed, then, for that leveling to happen?

An understanding of cultural differences is key but science can transcend cultural barriers. Today in some communities, science isn't just taught poorly or superficially—it's not taught at all. Adding it to the curriculum is a first necessary step, followed immediately by demonstrating the relevance of science to people's ordinary lives. Youth—like the rest of us—are most interested in learning subjects that have a direct impact on them: science, of course, is all around us and permeates every facet of life, but those connections are often invisible and need to be brought to attention.

Finally, Aboriginal Peoples youth must have better access than they do today to the tools and technologies required for studying science—and must have greater opportunities to participate in scientific work. Other research conducted by BioTalent Canada has shown that nothing trumps the value of experience in engaging young minds and preparing learners for careers in biotechnology.



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*Overcoming the 'technology gap' is critically important to creating opportunities for Aboriginal Peoples in Canada. At present, too few have access to the laboratory or other equipment to gain familiarity with them and establish comfort with the basic tools associated with the sciences. Education levels the playing field.*

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# Bridging the divide: Creating opportunities for Aboriginal Peoples to enter the bio-economy



**Based on its own extensive research, the findings of the 1999 *Balancing Choices* summit, and deep understanding of the needs of Canada's biotechnology sector, BioTalent Canada has identified a number of ways this country can foster Aboriginal Peoples' participation in the bio-economy.**

BioTalent Canada's feasibility study identifies three core areas where action is needed to draw more of Aboriginal Peoples into biotechnology:

1. Information and awareness-building
2. Community outreach
3. Curriculum support

To create biotechnology opportunities for the Aboriginal Peoples of Canada, we must encourage the pursuit of scientific education—and must equip learners for success in the college or university milieu.

## A breadth of possibilities

Retaining Aboriginal Peoples students—helping them complete their post-secondary educations—may involve any number of interventions and innovations including:

- Developing a strategic **communications plan** to raise awareness of science and promote careers in biotechnology.
- Hosting a **national science competition** for the youth within the Aboriginal Peoples.
- Establishing a **biotechnology "toolkit"** to increase knowledge and enthusiasm about science and distribute to educators, at career fairs at Aboriginal Peoples events.
- Hosting **career fairs** to speak directly to educators, students and their families.
- Operating a **'science mobile'**, a vehicle that would allow BioTalent Canada to bring the world of science directly to the Aboriginal Peoples communities and give exposure to the latest equipment and technology.
- Hosting biotechnology **science camps** for the Aboriginal Peoples.
- Establishing a **speaker's bureau** of role models who could reveal through their own experience the opportunities available in science to the youth of the Aboriginal Peoples.

- Partnering with educational institutions to provide **curriculum support** so that the Aboriginal Peoples students have a better chance of success at the post-secondary level.
- **Essential skills** upgrading to reinforce the fundamental learning required for employment in any field.

The suggestion to establish a science challenge exclusively for the youth of the Aboriginal Peoples is particularly compelling. To date BioTalent Canada has enjoyed great success with the Sanofi-Aventis BioTalent Challenge (SABC), an annual science competition that raises awareness among students, educators and the public of biotechnology. Similar competitions exist in a number of provinces that contain large populations of Aboriginal Peoples such as Manitoba, Saskatchewan and Quebec. BioTalent Canada could look to partner with the sponsors of these to establish a national science competition specifically for the youth of the Aboriginal Peoples.

## The way forward

It will be important for industry and government to partner with educational institutions and co-create remedial curricula that provide the youth of the Aboriginal Peoples with the full foundation of essential skills and scientific knowledge they need to succeed at the post-secondary level and becoming a contributing member of the community.

Finally, it will be important for Canada to focus on areas of specific opportunity for Aboriginal Peoples. Manufacturing and bio-energy are two promising fields given their proximity to the communities of the Aboriginal Peoples' communities and the fact that entry positions do not necessarily require post-secondary education, affording the chance for experience to be acquired more readily.

**Whether these steps or others are taken, the reality is we must act in a coordinated way to overcome the barriers and increase the Aboriginal Peoples' participation in science—and specifically in the fast-growing bio-economy. Working together, we can bridge the gap between promise and opportunity for the benefit and prosperity of all.**



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*Awareness-building, community outreach and curriculum development are all critical to fostering the involvement and success of Aboriginal Peoples in the bio-economy. Also critical—and connected in its own way to each of these—is the need for students to have hands-on access and exposure to science and biotechnology in the field, anchoring their interest to real-world experience.*

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## Building skills for Canada's bio-economy.

BioTalent Canada helps Canada's bio-economy industry thrive globally. As a non-profit national organization of innovators leading our bio-economy, BioTalent Canada anticipates needs and creates new opportunities, delivering human resources tools, information and skills development to ensure the industry has access to job-ready people.

With a direct link to a network of leaders in Canada's bio-economy, BioTalent Canada is the industry's trusted and comprehensive source for human resource information and skills development. BioTalent Canada is a Canadian sector council—one of many partnership organizations created to address skills-development issues in key sectors of the economy.

## About Sector Councils

Sector councils work as a uniting element to engage business, workers, educators, professional associations and government in a strategic alliance that is focused on determining the specific skills and human resource needs that will enable the sector to thrive. Sector Councils provide an industry-specific focus that highlights the technological advancements, human resource planning, training opportunities and industry forecasting, enabling businesses to better prepare for current and future developments.

## Strong Board of Directors

The Board of Directors is composed of experts in the field of HR: CEO's, CFO's and CSO's from across Canada with extensive financial and industry experience representing companies and organizations in Canada's bio-economy. BioTalent Canada is not a membership organization and therefore relies on the guidance provided by its dedicated volunteer Board of Directors.

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