

# BRIDGES

FROM THE COMMUNITY TO THE CLASSROOM

## BIOTECHNOLOGY – CLONING NEW CAREERS

**R**emember the old jokes that used to start with the line, "What do you get when you cross...?" The answer to that joke today is, "One of the fastest-growing industries in Canada – biotechnology." That revelation is usually followed by another question, "What is biotechnology?" The working definition is that it is "any modern technology that uses living organisms or parts thereof, to produce or modify products, to improve plants or animals, or to develop micro-organisms for specific uses." It's a science-driven industry that, according to surveys, only a third of Canadians are aware of, and the rest understand even less.

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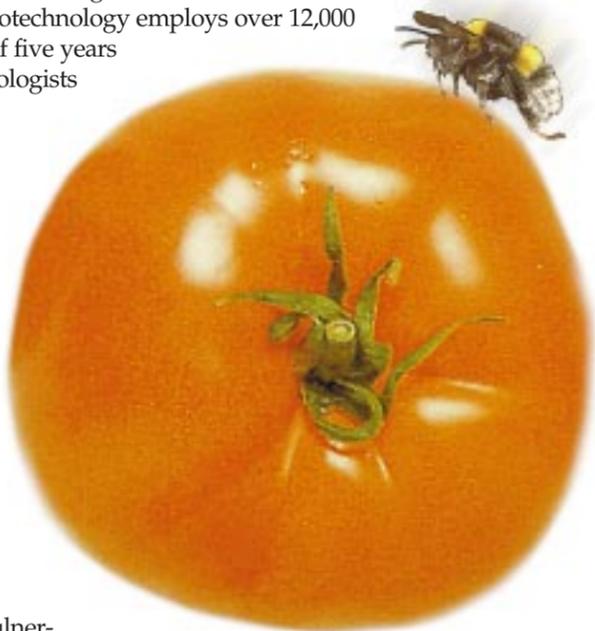
- Theresa McCurry

British Columbia is Canada's leading biotechnology region, with more than 70 companies creating jobs in fields unheard-of as little as 10 years ago. The industry is represented by the BC Biotechnology Alliance (BCBA), an organization created to increase public awareness and understanding of the field, and support education programs at the public school level that encourage students and teachers to explore careers in biotechnology. Says Theresa McCurry, Executive Director of BCBA, "British Columbia requires a continual flow of high school students choosing biotechnology as a career path."

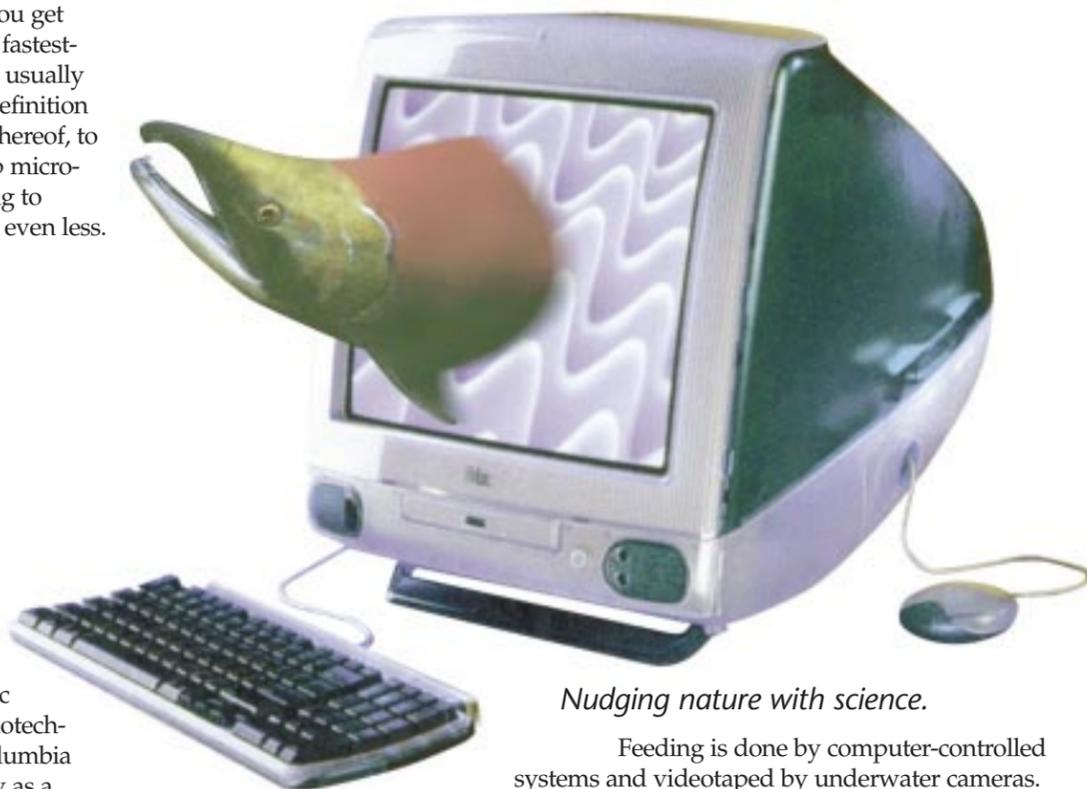
That path can lead to some exciting destinations. The field of Canadian healthcare biotechnology employs over 12,000 people, double the level of five years ago. Healthcare biotechnologists

want to be viewed as engaged in developing products to sustain and improve the quality of life. Unquestionably, many exciting advances are being made in that field, including the work of BC's own QLT PhotoTherapeutics Inc., that has developed breakthroughs using pharmaceutical compounds and light in combination for cancer treatment. However, the industry is aware of its vulnerability to public relations problems. According to Frank Holler, President of ID Biomedical Corporation, "People tend to fear what they don't know; and recently, a few sensational stories (e.g., *Jurassic Park*, *Dolly* – the sheep, and human cloning) have done much to feed such fears."

The BC salmon farming industry is heavily dependent on biotechnology to deal with issues, including the quality of farm salmon and the environment. The industry produces 2,400 jobs on salmon farms that would occupy, in total, an area equal to one-sixth of Vancouver's Stanley Park. Salmon farms are a living laboratory.



Opening the door to bumblebees.



Nudging nature with science.

Feeding is done by computer-controlled systems and videotaped by underwater cameras.

This allows the industry to grow more fish on less food (the term used is feed conversion), as well as reduce organic waste.

Biotechnology is making inroads in BC's primary industry – forestry. While mankind has been experimenting with different breeds of corn for hundreds of

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years, genetic experimentation with trees has only been around for 50 years, and it takes 30 years to see the results. Biotechnologists believe that they can bring some fast-start solutions, including the introduction of microbes to enhance tree growth.

The BCBA has a number of programs geared to help teachers and students gain a better understanding of this new field. A two-day workshop is offered for teachers at UBC to help them introduce the science of biotechnology to students. In cooperation with BIOTECCanada, the BCBA will offer a career awareness package in the winter of 1999, which will include a reference guide profiling 50 biotechnology occupations and a CD-ROM for use by students as a self-directed learning tool.

## BIOTECHNOLOGY PRIMER

**F**ood biotechnology is defined as the use of living material to enhance food production for the quality of food supply. The concept has been around ever since early civilizations put yeast in beer or bacteria in yoghurt. The application of genetic engineering to increase food supply is driven in part by the fact that in 40 years, the world population is expected to increase to nine billion, requiring a 250 per cent increase in world food production.

Currently, research in food biotechnology focuses on reduced herbicide

use through herbicide-tolerant plants, improved pest resistance, and the survival of crops in cold weather and droughts. Projects being actively pursued in the laboratory include high-starch potatoes that will absorb less fat when fried, strawberries and can-

taloupes that will resist viruses, and grapes that can withstand the cold.

Some food improvement projects are

not the product of laboratory experiments. One BC company increased tomato production in its greenhouses by 30 per cent simply by allowing bumblebees inside the greenhouses to pollinate the plants.

## BIOLOGICAL PIRATES?

A new type of prospector is looking for medicinal gold in jungles from Brazil to the Philippines. Pharmaceutical prospectors representing international firms search the exotic plant life in distant jungles for potential cures. This has prompted disputes about ownership. Recently, the government of India sought a court ruling to determine who owns the healing powers of the spice turmeric. In a yellow powder form, it has been used for hundreds of years by Indians for cuts and grazes, but has been patented in the United States. At the *Earth Summit* in Rio de Janeiro, protocols were developed in an attempt to address bio-piracy in order to see that the benefits stemming from the use of bio-prospecting were shared between companies and countries.