

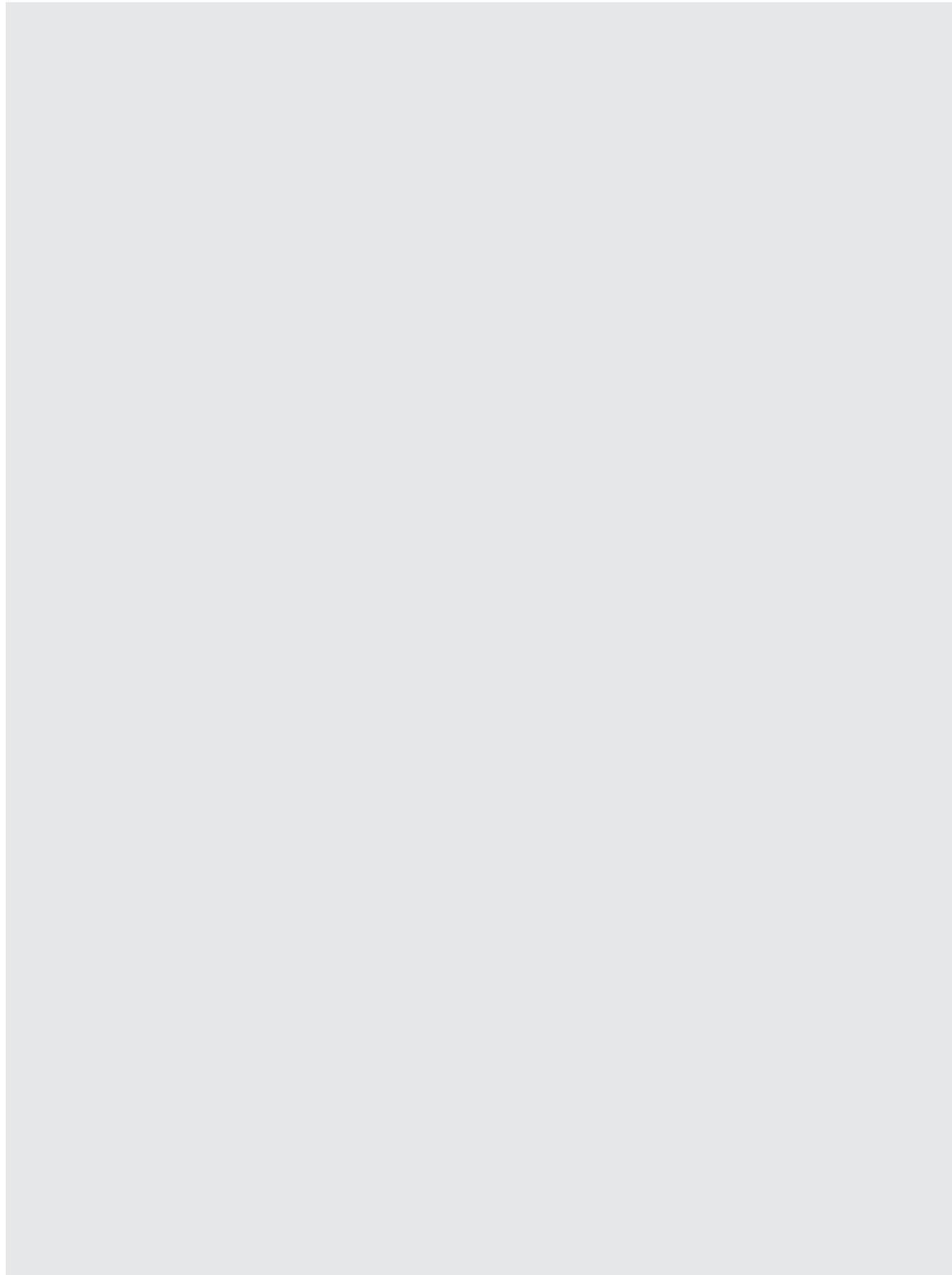
The growth of bio-agriculture • Funding big ideas • Modelling success in bioinformatics

BIOZINE

Spring 2004

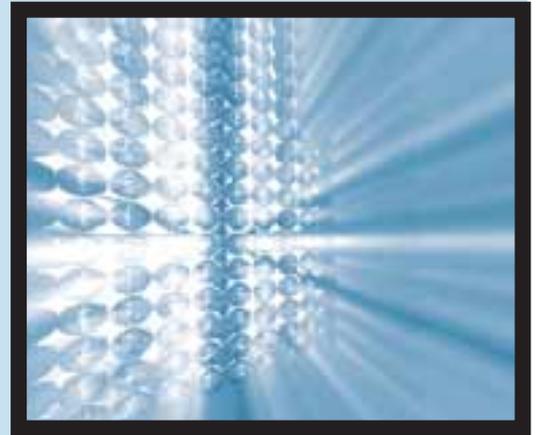
The official magazine of Alberta's bioindustry



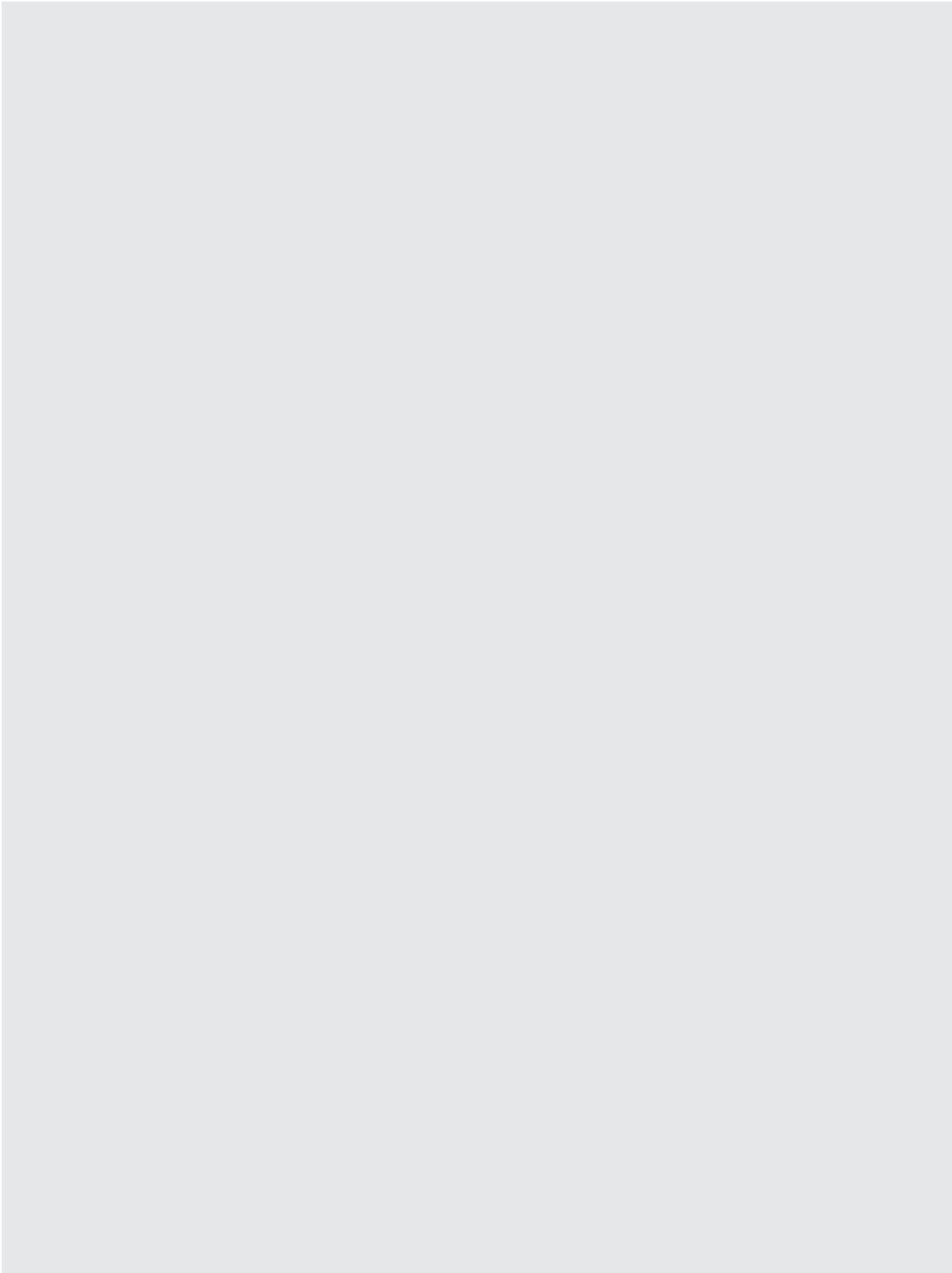


BIOZINE

CONTENTS



- 6 Five Years of Progress**
BioAlberta executive director Myka Osinchuk and board chair Andrew Baum look back at the association's first five years and forward to its future
- 9 The Road Leads to Alberta**
Knowledge industries such as biotechnology are finding a wealth of opportunity in this province
by Dr. Richard Perry
- 10 Bridging Gaps**
Promoting awareness of science in our society is a key goal for BioAlberta
by Sherry Kully
- 12 Spotlight**
Meet the winners of Alberta's biotechnology awards
- 14 Sowing the Seeds**
Agricultural biotechnologists are developing new crop strains which will bear fruit in the future
by Ian Doig
- 19 The Next Wave**
As the biotech sector in Alberta matures, new companies are sprouting up to build on the opportunities
- 27 The Colour of Money**
Finding patient, risk-oriented capital is key to success for Alberta's biotechs
by Kenton Friesen
- 30 Licensed to Sell**
An excerpt from Basic Drug and Biotech Licensing Issues
by Gordon Sustrik and David Parkatti
- 32 Alberta's Biotech Leaders**
- 34 BioAlberta Members and Board of Directors**



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PUBLISHER/EDITOR

Ruth Kelly

rkelly@venturepublishing.ca

EXECUTIVE EDITOR

Myka Osinchuk

myka@bioalberta.com

MANAGING EDITOR

Ryan Radke

ryan@bioalberta.com

ART DIRECTOR

Tamara Powell-Surtees

tpowell-surtees@venturepublishing.ca

PRODUCTION

Vanlee Tran

production@venturepublishing.ca

CIRCULATION

Rob Kelly

circulation@venturepublishing.ca

ADVERTISING REPRESENTATIVES

**Pardee Badyal, Ralph Crespo, Anita McGillis,
Kathleen O'Halloran**

CONTRIBUTORS

**Ian Doig, Kenton Friesen, Sherry Kully, David
Parkatti, Dr. Richard Perry, Gordon Sustrik**

bio
alberta

Phipps McKinnon Building

Suite 1730

10020 - 101A Ave NW

Edmonton, AB T5J 3G2

T: 780 425-3804

F: 780 409-9263

E: info@bioalberta.com

EXECUTIVE DIRECTOR

Myka Osinchuk

BIOPRODUCTS MANAGER

John Christensen

MANAGER, INDUSTRY DEVELOPMENT

Ryan Radke

EVENTS COORDINATOR & MEMBERSHIP ADMINISTRATOR

Sherry Kully

ADMINISTRATIVE ASSISTANT

Sandra Wilburn

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FIVE YEARS OF PROGRESS

BIOALBERTA EXECUTIVE
DIRECTOR MYKA
OSINCHUK AND BOARD
CHAIR ANDREW BAUM
LOOK BACK AT THE
ASSOCIATION'S FIRST
FIVE YEARS AND
FORWARD TO ITS
FUTURE



This year, BioAlberta will celebrate its fifth anniversary. We've supported the bioindustry in Alberta through its growth from less than 25 companies to more than 60, through the "hot" markets of 2000/2001, the nuclear winter in 2002/early 2003, and back to a positive climate for growth this year. Our activities have centered around marketing and creating awareness of Alberta's industry and research capabilities, and around providing networking/training/business development assistance to our members. Over the past year, our attention has turned to advocacy. BioAlberta has been actively meeting with government officials to talk about the opportunities that the bioindustry holds for Alberta, and to encourage policy changes that will ensure that our industry continues to grow.

Advances in life sciences research and industry are taking place on the world stage. There is global recognition of the future economic potential of the biotechnology sector, and jurisdictions around the world are taking definitive steps to capture that potential. Furthermore, wealth creation and economic diversification are only a small part of the life sciences revolution; while the speed of the Internet has transformed the way business operates, the speed of new advances in life sciences is blurring the boundaries between agribusiness, chemicals, health, pharmaceuticals, energy, and computing.

Biotechnology holds the promise of improved human health and welfare through better understanding of disease, improved diagnosis, and treatment with more specific biopharmaceutical products. The genetic enhancement of agricultural and food products will deliver productivity, competitiveness and sustainability benefits. Environmental protection, bioremediation, sustainable forest development and innovation of the energy industry will all be possible through life science research and innovation.

Alberta is already part of this growing global industry. The province has proven, world-class strengths in life sciences research. We are

developing innovative products, building growing enterprises, attracting investment and creating high value employment. However, the continued expansion of the province's emerging life-sciences sector is far from guaranteed. Other technology centres around the world have recognized the growth potential of this sector and are developing innovative strategies for increasing scientific, social and economic returns in their regions.

The transformation and development of Alberta's economy depends to a large degree upon innovation and the growth of technology-based industries. Information technology, wireless, new media and biotechnology are already emerging as potential world-class technology clusters in Alberta. Of critical importance is the political will required to build and sustain these industries and a continued commitment to ensuring a positive business climate for the growth of industry. There is a need for a targeted set of programs designed to meet the unique character of the bioindustry.

Our Vision

Alberta has an unparalleled opportunity to capture the enormous economic, health, environmental and societal potential that will arise from innovation and a global vision. With the support of the provincial government, the bioindustry sector in Alberta can achieve the following in the next five to 10 years:

- Sustain at least two large revenue-generating, locally originated biotech companies in Alberta;
- Increase the number of biotech companies to more than 100: both companies based in Alberta, and significant local operations of non-Alberta based companies. Distribution of those companies would be as follows: 40% start-up (one to three years), 30% early development phase (pre-clinical – Phase I/II), 15% late development phase (Phase II/III), 15% revenue from products;
- Increase the number of people directly employed in biotech to 5,000;
- Heighten the recognition of Alberta as an "up and coming" global biotech region;
- Establish a pool of experienced talent to encourage, advise, and support the growth of Alberta's bioindustry.

The Road Ahead

BioAlberta's policy agenda over the next two years includes the following recommendations:

Establish provincial SR&ED tax credit

Improve our global competitiveness through the implementation of a provincial research and development tax credit.

Facilitate equity investment

Introduce mechanisms that would improve the availability of equity capital for Alberta technology companies.

Provide provincial personal income tax exemption for foreign researchers and executives

Encourage the attraction of highly skilled workers to the Alberta by introducing a five-year provincial personal income tax exemption on employment income for out-of-province researchers employed by a business conducting research and development in Alberta and for individuals with specific skills and/or experience unique to the biotechnology industry.

Improve access to and commercialization of technology

Harmonize technology commercialization policy in Alberta and improve mechanisms for industry/research partnerships that will facilitate commercialization and industry access to Alberta technology.

Actively involve industry

Actively support industry development initiatives by industry development organizations and ensure that industry is included in policy decision-making.

In addition to the advocacy agenda, BioAlberta also plans to introduce new member programs, expand our linkages with the Biotech Accord to step-up discount programs, increase our science awareness activities, and explore opportunities for a least one industry conference in Alberta.

These activities all serve our BioAlberta's mission: to attract, build, retain and grow the bioindustry in Alberta. We will continue to help our 125 plus members grow their business through our advocacy, marketing, and business support activities. **BZ**



Myka Osinchuk
Executive Director
BioAlberta



Andrew Baum
Chairman
BioAlberta
CEO, SemBioSys Genetics Inc.

THE ROAD LEADS TO ALBERTA

KNOWLEDGE INDUSTRIES SUCH AS BIOTECHNOLOGY ARE FINDING A WEALTH OF OPPORTUNITY IN THIS PROVINCE

BY DR. RICHARD PERRY

B iotechnology and life sciences companies from around the world are discovering that the road to success leads to Alberta. A positive environment, world-class research facilities, a beneficial tax structure, a commitment to innovation and a great quality of life are just a few reasons why companies are choosing Alberta as the place to live, work and do business.

Alberta consistently leads the nation in many key economic areas. In 2003, employment in Alberta grew by 2.9%, the highest rate in Canada. The unemployment rate was only 5.1%, and Alberta is known for having one of the most productive work forces in Canada, with 49% of workers holding post-secondary degrees or certificates.

Financially, Alberta is a model for North America, with its commitment to balanced budgets and debt reduction payments. Personal taxes continue to be among the lowest in Canada, especially at higher income levels, which is attracting executive level personnel, investors and entrepreneurs.

Alberta has earned a favourable reputation as a region that offers a superior quality of life, from a rich cultural scene to recreational areas in picturesque settings. The province has a world-class health care system and an education system ranked among the best in the world. Alberta is a prosperous province that brings together the best in medicine, energy and agriculture, and is now becoming a centre for knowledge industries like biotechnology, nanotechnology, and information and communications technology.

Alberta also has a positive reputation for its commitment to supporting research infrastructure. Current projects under construction include the Health Research Innovation Facilities in Edmonton and Calgary, the National Institute for Nanotechnology, and the Centres for Cardiac and Osteoporosis research.

Through the Alberta Science and Research Authority and the Alberta Heritage Foundation for Medical Research, the government of Alberta has established a tradition of scientific excellence within the province's research community. Alberta is also home to several organi-

zations that help commercialize products and transfer ideas into companies resulting from this research, including Inno-centre Alberta, AVAC Ltd. and the Alberta Research Council.

Alberta is now concentrating on bringing various sectors together, particularly the biotechnology and biomedical industries. SemBioSys Genetics is combining genomics and agriculture in molecular pharming applications. Bioinformatics is being used by CyberCell Technologies Inc. to produce virtual cells, and BioTools Inc. to make gene visualization products. Bioproducts is another emerging area in Alberta, with developments in agri-health applications, nutraceuticals, energy foods and bioplastics.

Biotechnology companies have found Alberta to be the right place to do research. Cytovax Biotechnologies Inc. is developing novel approaches to prevent and treat infectious diseases. BioMS Medical Corporation is working on drugs to combat multiple sclerosis. Oncolytics Biotech Inc. is helping treat cancer with its reo-virus. Diagnostic firms, like Chenomx Inc., are using nuclear magnetic resonance to help pharmaceutical companies solve their clinical study challenges. SciMed Laboratories Inc. is using microbiologics to test the nutritional value of food and beverages. Alberta is also home to many biomanufacturing and packaging companies, including NAEJA Pharmaceuticals Inc., Degussa AG, KS Avicenna and Banner Pharmacaps (Canada) Ltd.

Thanks to a nurturing environment, solid research infrastructure and commitment from government, biotechnology companies have found success in Alberta. Alberta Innovation and Science continues to do its part to promote research and innovation, and connect companies, researchers and funders. This commitment and those partnerships are making Alberta's biotechnology sector strong and globally competitive. **BZ**

For more information on the Government of Alberta's support for the biotechnology industry, contact Dr. Richard Perry at richard.perry@gov.ab.ca or visit www.innovation.ab.ca

BRIDGING GAPS

PROMOTING AWARENESS
OF SCIENCE IN OUR
SOCIETY IS A KEY GOAL
FOR BIOALBERTA

BY SHERRY KULLY

B iotechnology is creating new wealth, jobs and products that are improving the quality of life in Alberta. As the industry grows, it is critical that Albertans are well informed about the benefits of the science and the industry, and that students be given the opportunity to learn about and consider careers in the bioindustry in Alberta.

Fostering interest in life sciences is a key priority for BioAlberta. A knowledge gap exists between the general public and the bio-community in the province, and BioAlberta is working to bridge this gap through outreach to teachers and students, the general public and opinion leaders.

Our goals include:

- Increasing the number of students in the province pursuing biotechnology careers through programs that provide students with hands on experience in developing projects and working directly with biotechnology industry and scientific mentors;
- Raising general public awareness, understanding and appreciation of biotechnology;
- Enhancing the ability of opinion leaders to make well-informed policy decisions by providing timely information and hosting educational forums on biotechnology topics for key government officials, policy leaders, members of the academic community and industry.

A key component of our science awareness activities is the Aventis Biotechnology Challenge. BioAlberta has hosted this event for the past four years in Edmonton, and the past three in Calgary, supported by national and regional sponsors. The competition is held annually in 12 centres across the country. The competitions are intended to raise awareness among students, educators and the public about the emerging science of biotechnology and its applications in health care, agriculture and the environment.

Each Aventis Biotechnology Challenge features the outstanding work of high school students who have conducted research projects and experiments of their own design in some area of biotechnology. Cash prizes are awarded to the top five student teams and their schools

based on the recommendations of judges from the scientific and education communities as well as the biotechnology industry. BioAlberta and Merck Frosst Canada have also host a lecture series on various aspects of biotechnology as part of the Aventis Biotechnology Challenge experience.

This year's competition featured 17 student teams competing in Edmonton on April 26 and 27, 2004, and 9 teams competing in Calgary on May 3 and 4, 2004. Regional sponsors for the events included Alberta Agriculture, Food, and Rural Development, Calgary Technologies Inc., Genome Prairie, Merck Frosst Canada Ltd., Monsanto Canada Ltd., Protein Engineering Network of Centres of Excellence, SemBioSys Genetics Inc., the University of Alberta and the University of Calgary. National sponsors were Aventis Pasteur, Biotechnology Human Resources Council, VWR International Inc., Canada Youth Employment Strategy (HRDC), National Research Council and the Canadian Institutes of Health Research.

BioAlberta will continue to engage, excite and educate the public (and in particular students) about biotechnology and its incredible potential to impact every part of our lives from health to food and the environment. **BZ**

For more information about the Aventis Biotechnology Challenge in Alberta, contact Sherry Kully via email at sherry@bioalberta.com.





Above: **Charles Tran** (2004 Edmonton winner) receives the congratulations of his mentor, Dr. Bruce Ritchie

2003 Alberta Aventis Biotechnology Challenge winners:

Karalee Beedell, Foothills Composite
High School

"Alternative Cell Receptors for the
Uptake of Recombinant Adenoviral
Vectors"

Mentor: Dr. Daniel Muruve -
University of Calgary

Farah Chowdhury, Old Scona
Academic High School

"Testing in vivo Therapeutic Potential
of Novel Acyclic Nucleoside in the
Duck Hepatitis B (DHBV) Model"

Mentor: Dr. Lorne Tyrell - University
of Alberta

2004 Alberta Aventis Biotechnology Challenge winners:

Charles Tran, Old Scona Academic
High School

"Characterizations of Mutations of
the Factor VII Gene"

Mentor: Dr. Bruce Ritchie -
University of Alberta

Vladic Lavrovsky, Queen Elizabeth Jr./
Sr. High School

"Directed Evolution of Hydrocarbon
Degrading Enzymes"

Mentor: Dr. Michael G. Surette

Left: **Vladic Lavrovsky** (2004 Calgary
winner) shows off his display on hydro-
carbon degrading enzymes

SPOTLIGHT

MEET THE WINNERS OF ALBERTA'S BIOTECHNOLOGY AWARDS

SciMed Laboratories Inc.

On March 18, 2004, SciMed Laboratories Inc. was awarded first prize by VenturePrize – the second annual Greater Edmonton Business Plan Competition.

VenturePrize is the largest business plan competition of its kind in Canada, and is designed for individuals, companies, and faculty and students of post secondary institutions who have high-growth business ideas. The award provides SciMed Laboratories with a \$100,000 Grand Prize, comprised of \$25,000 in cash, \$25,000 of in-kind business services and \$50,000 of in-kind research and technology commercialization services from Alberta Research Council.

SciMed Laboratories is a biotechnology firm dedicated to the betterment of human health. SciMed has initiated development of a new methodology that will provide dairy processors with a user-friendly diagnostic kit capable “on-site” analysis of vitamins A and D in milk samples. In addition, SciMed intends to develop and commercialize diagnostic kits for detecting toxic residues for the agri-food and clinical sectors.

Dr. Mark Redmond, Ceapro

In November of 2003, Dr. Mark Redmond was awarded the BioAlberta 2003 Award for Entrepreneurship in Alberta.

Redmond is the president and chief executive officer of Edmonton-based biotechnology company, Ceapro. With over 60 patents to his name, Redmond has led Ceapro's product and technical developments into the global markets of nutraceuticals, veterinary medicine, personal care, industrial and medical products.

In accepting the award, Dr. Redmond paid tribute to the enterprise and tenacity of Ceapro staff, as well as the commitment of the Ceapro's directors and shareholders. “The hard work of the Ceapro team has resulted in a company that is not only profitable but, when assessed on revenue growth, is one of the fastest growing companies in Alberta,” he stated.

Ceapro is a biotechnology company that develops and commercializes natural products for medical and animal health industries using proprietary technology and renewable resources. Ceapro trades its shares on the Canadian TSX-Venture Stock Exchange (TSXV-CZO).



Pictured left to right is the management team of SciMed Laboratories: Dr. Xinli Tang, Director R&D; Dr. Mark Salkie, Medical Director; Ms. Holly Riopel, VP Corporate Development; Dr. Rajan Gupta, Founder & CEO

Dr. Gerald Tertzakian, Hannibal Ventures Inc.

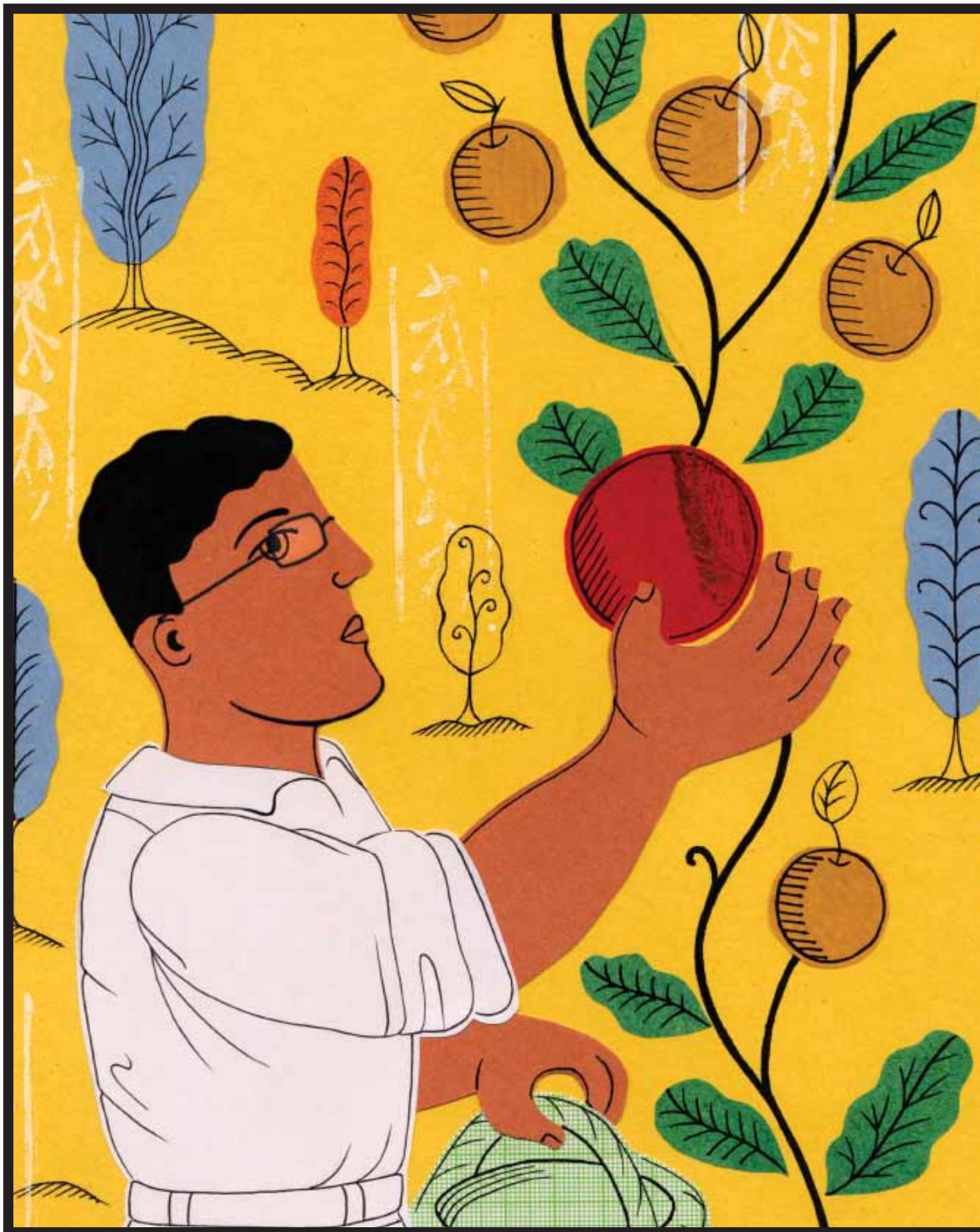
In November 2003, Dr. Gerald Tertzakian was awarded the BioAlberta 2003 Award for Industry Leadership.

Dr Tertzakian has been a dedicated leader in Alberta's technology community for the past 30 years. He is the former CEO of Cytovax and was the founder and CEO of Cytovax's predecessor company, Biotex Laboratories Inc. Dr. Tertzakian also spent time as president of Raylo Chemicals Inc. and has been the recipient of numerous awards. He is a senior advisor to the University of Alberta and a member of various boards of directors.

Dr. Tertzakian is currently the president of Hannibal Ventures Inc., a technology seed capital venture company. **BZ**



Pictured left to right: Dr. Mark Redmond of Ceapro; BioAlberta Chair Andrew Baum; BioAlberta Executive Director Myka Osinchuk; Dr. Gerald Tertzakian of Hannibal Ventures



Sowing the Seeds

A small group of companies and researchers have emerged as leading examples of what is possible within Alberta's agricultural biotechnology sector. Alberta farmers are already great consumers of genetically modified seed and new applications for agricultural biotechnology are taking shape. While farmers buy millions of dollars in seed yearly from international farm product corporations, financial success for most agricultural biotech developers is measured in terms of investment dollars landed.

In 2003, Alberta's public and corporate agricultural research and development establishments spent an estimated \$135 million, approximately 80% of which came from public sources and 20% from private. Of this, 18.5% went to areas affecting biotechnology directly.

The Alberta Agricultural Research Institute (AARI) is the province's leading agency for co-ordination and support of agricultural research, providing grants for basic research ongoing at universities, private sector and government laboratories. As well, the Alberta Research Council (ARC), a subsidiary of the provincial government's Alberta Science and Research Authority (ASRA), develops and commercializes technologies on a contract or co-venture basis, providing biotech corporations with needed resources.



AGRICULTURAL BIOTECHNOLOGISTS ARE DEVELOPING NEW CROP STRAINS WHICH WILL BEAR FRUIT IN THE FUTURE

BY IAN DOIG

SOWING THE SEEDS

Agricultural biotechnology is largely about the genetic refinement of crops and livestock. The most widely introduced genetic modifications for seed are for herbicide tolerance and insect tolerance and resistance. Research in plant genomics, or genetic makeup, could also potentially yield modified plants better able to tolerate drought, salinity, extremes of hot and cold and other stress factors. Farmers have recognized the technology's potential to boost tight profit margins. Leaders in this research include Edmonton's AgriGenomics, which is working with the Alberta Research Council on a collaborative research project to develop genetically improved crops with increased nutrient uptake, lower use of fertilizer, and greater resistance to diseases and pathogens. The joint research project combines ARC's expertise in crop improvement and plant disease management, with the expertise of AgriGenomics in genetic mapping and gene identification. The three-year project is focused on developing molecular tools for improving crops.

The research here is cutting edge. Historically, plants are bred under ideal conditions. Such conditions do not always prevail in the field. Much of the fertilizer used on crops, for example, is lost as it leeches into the ecosystem. The company is developing plants more efficient at utilizing particular fertilizers. AgriGenomis founder Dr. Allen Good is a professor of genetics at the University of Alberta. "It would be the equivalent of having a car that gets 20 miles to the gallon," he explains. "You put in a piece of technology that ups the mileage to 40 miles per gallon. Your cost saving becomes significant over time." According to Good, industry players are eager to buy in if the technology is proven.

Another company that has benefited from AARI basic research funding is Calgary's SemBioSys Genetics Inc. Founded in 1994, SemBioSys was built on a revolutionary means of producing and purifying proteins from plant seeds developed by the University of Calgary's Dr. Maurice Moloney. SemBioSys is positioned in what is essentially a new niche – a gray area between agriculture and medicine. It's a niche that has garnered significant investment interest: Dow AgroSciences Canada, a large producer and distributor of solutions in weed, insect and disease management and plant genetics and subsidiary of its global parent based in Indianapolis, Ind., has invested \$10 million. Proteins being grown by SemBioSys have pharmaceutical applications as treatments for everything from diabetes to hair loss. The technology itself has



wide applications that include not only ingredients for medicine but cosmetics and food and livestock feed additives. Specialized farmers will grow, in genetically modified crops, products typically manufactured in production facilities.

Dow AgroSciences has also been active in developing new oil seed varieties such as high-oleic varieties of canola seed. High-oleic canola oil contains more natural monosaturated fats than regular canola oil and doesn't require the hydrogenation process, which produces trans fatty acids. Because of that, the product is sought after by food manufacturers who are being driven to eliminate trans fats from their products by health-conscious consumers. Speciality canola crops are proving to be a financial boon for beleaguered prairie farmers.

Agricultural biotechnology has stirred a great deal of public controversy along consumer health and environmental lines. However, Canadian biotechnology advocates remain upbeat, as North American markets remain more open to the technology than the European markets. Greater public acceptance of agricultural biotechnology and a more stable international market is inevitable, as biotechnology advances in medicine and consumer goods positively and directly affect urban dwellers.

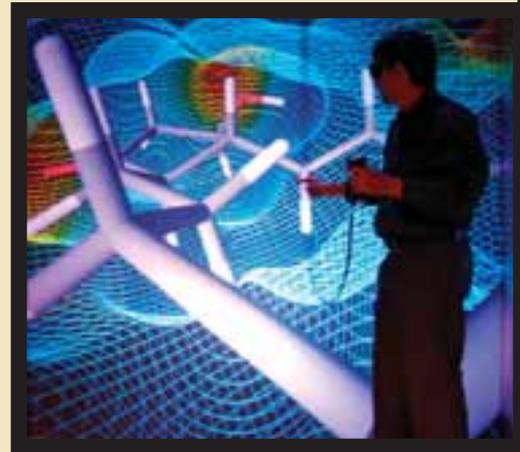
There is a growing government and public awareness of the encroachment of technology and leading-edge science on traditional agricultural techniques. Farming is appreciably different now than it was even just five years ago in terms of a broad adoption of technology from computer to biological. This has touched off a realization that the agriculture business is undergoing fundamental change. With exponential growth predicted in the agricultural biotechnology sector, it makes sense, say researchers and company representatives, that federal and provincial governments as well as Canadian venture capitalists stay on top of the sector. With support, including positive public relations and objective media reportage, great things already being developed in Alberta will further change the face of agriculture, benefiting the provincial economy. **BZ**

As the biotechnology sector in Alberta matures, new companies are sprouting up to build on the opportunities

The Next Wave

Twenty-seven years ago, pioneering researcher Dr. Ray Lemieux launched Chembiomed, Alberta's first significant biotech business. The company's intent was to find practical uses for the research that Dr. Lemieux had done on molecular recognition and it quickly became a world leader in the production of biologically active carbohydrates.

From that modest beginning has grown Alberta's thriving bioindustry. While still comparatively small, the sector is achieving the critical mass required to allow spin-off businesses and complementary companies. Among the established leaders like Isotechnika, Biomira and SemBioSys Genetics are a crop of new biotechs eager to make their mark and expand the industry even further.



THE VISUAL GENOMICS CENTRE AT THE U OF C HERALDS A NEW ERA OF RESEARCH

THE NEXT WAVE

The universities continue to offer fertile breeding ground for new technologies and innovative compounds. One of the most exciting is TS Biotech Inc., led by Dr. Derrick Rancourt. A University of Calgary spin-off launched in 2001, TS Biotech is based on Rancourt's research with two serine proteinases identified by his team, which are associated with the processes of hatching and implantation. The company is pursuing applications for the research in the areas of assisted reproduction and fertility diagnostics for both humans and animals.

"We've identified proteinases in the mouse that appear to be involved in the early stages of embryo implantation," Rancourt explains. "There is evidence that we can suppress fertility using small molecular inhibitors that would replace the chemical controls of existing birth control methods. We may also be able to facilitate assisted reproduction."

The intellectual property of University of Alberta's Drs. David Bundle and Glen Armstrong is the basis of TheraCarb Inc. Pending patenting, TheraCarb is focused on developing a therapeutic agent that treats Alzheimer's disease by lowering the serum amyloid P component that is associated with the illness.

Both TS Biotech and TheraCarb benefited from a 2003 showcase event staged by BioAlberta and Inno-Centre Alberta, entitled BioFinance Excelsator. Inno-Centre Alberta, a private non-profit organization funded by the Alberta Heritage Fund for Medical Research, Alberta Ingenuity Fund, Alberta Research Council, Alberta Science and Research Authority, AVAC, University of Alberta, University of Calgary, National Research Council Canada and Western Economic Diversification, has played an important role in supporting this next wave of biotechs.

"Our business advisors at Inno-Centre have been instrumental," Rancourt says. "They suggested that we needed to do more research and development before we went into the investment community. Just recently, we've gotten to a point with proof of concept that we should be able to seek our seed financing. We're looking for private placement in the order of \$500,000 and believe we can leverage that with government funds to the point of having a lead inhibitor for the contraceptive. That initial

Another Inno-Centre - supported biotech is NemaRx, a highly promising U.S. pharmaceutical start-up that relocated to Calgary to participate in the business development mentoring program.

fund will also take us further along in proof of concept for assisted fertility.

“Drug development is an expensive process and we won’t be able to do this singlehandedly. But we do see ourselves taking this into clinical trials. Most drug companies want to see concepts proven through phase one and two trials but the indications are that there is still a lot of interest in the fertility market for those concepts that are proven to be viable.”

Another Inno-Centre-supported biotech is NemaRx, a highly promising U.S. pharmaceutical start-up that relocated to Calgary to participate in Inno-Centre Alberta’s business development mentoring program. NemaRx (formerly NemaGain) possesses intellectual property with an impressive pedigree, including a Nobel Prize winner amongst its co-founders. Dr Robert Horvitz is co-recipient of the 2002 Nobel Prize for physiology or medicine. Co-founder and CEO Dr Andreas Wissmann relocated to Calgary along with the company. NemaRx’s technology platform is based on screening technology considered well suited to treating neurodegenerative diseases such as Parkinson’s disease and Alzheimer’s disease. It is currently used to test painkiller therapies. According to Inno-Centre Alberta’s president Susan Miller, the firm’s founders decided upon relocation based on her organization’s mentoring program, as well as potential support from Genome Prairie, the Industrial Research Assistance Program and the Alberta Heritage Foundation for Medical Research.

NemaRx has developed laser screen technology that allows it to study the effect of pain perception on tiny worms called *C. elegans*, no bigger than a fruit fly. Despite their primitive physiology, the worms do have a nervous sys-

THE NEXT WAVE

CardioMetabolics' drug protocol is targeted to help children under one year of age or seniors who are in need of open heart surgery but are considered "at risk".

tem and share similar genes to human beings, making them an ideal test subject. NemaRx examines the worms using automated image-recognition software. After applying digital laser impulses to the worms, the company then provides a prospective pain remedy and measures the worm's level of response.

The hope is that using *C. elegans* to test the therapeutic compounds will increase the chances of finding appropriate pain remedies, while reducing both the cost of drug development and the time to market. The company's efforts are being observed with keen interest by the major pharmaceutical firms.

Another Alberta-based biotech that is hoping to develop a new animal model for drug testing is KMT Hepatech. Launched by a team of University of Alberta researchers which includes former dean of medicine Dr. Lorne Tyrrel, the company will commercialize their creation of a mouse model that scientists can use to test antiviral therapies against Hepatitis C, a contagious viral disease that usually leads to serious, permanent liver damage. The disease afflicts about 175 million people around the world.

Dr. David Mercer, the lead author of the paper that revealed the creation, believes that the mouse will be of major assistance in the fight against the disease. "We now have a viable way of testing new drugs which might ultimately help lead to the development of a cure," he says.

Essentially, the researchers transplant human liver cells into a genetically modified mouse; the transplanted cells then begin to rapidly divide and fill up much of the mouse liver. These "chimeric" mice can then be infected with the Hepatitis C virus; previously only humans and chimpanzees were susceptible to this virus. "Not only does the new

mouse model give researchers the ability to test new therapies,” says co-principal investigator Dr. Lorne Tyrrel, “it also allows researchers to study questions hitherto impossible to study, such as how the virus infects healthy cells and how the virus replicates.

“This advances opens the floodgates on basic and applied research,” says Tyrrel, whose previous work on the Hepatitis B virus led to the development of a revolutionary new drug proven to an effective treatment for Hepatitis B.

An equally exciting advance was announced by CardioMetabolics in February of 2004, when the company’s U.S. patent was issued for a new drug composition, combination and treatment method developed for high-risk young children and elderly adults facing open-heart surgery. Another U of A spin-off, CardioMetabolics’ X-11S is the company’s leading drug candidate currently in progress for an Investigational New Drug submission to the U.S. FDA under a large multinational, multi-centre clinical trial, with “Accelerated Clinical Development” status.

“Securing the patent is a key milestone because it paves the way for moving this drug treatment from the lab towards marketplace,” says CardioMetabolics president Eva Mah Borsato. “This patent greatly enhances the market value of our current patent portfolio and gives our investors and partners the intellectual property protection needed to develop our leading drug candidate aimed at benefiting underserved populations who have acute heart disease.”

The drug protocol is targeted to help children under one year of age and seniors 70 years or older who are in need of open heart surgery but are considered “at risk” due to their medical condition prior to surgery. The drug addresses recovery complications that can occur when blood is introduced back into the heart following surgery.

BIOINFORMATICS - THE MAP TO HEALTH

Bioinformatics is defined as the use of computers in solving information problems in the lifesciences; mainly, it involves the creation of extensive electronic databases on genomes, protein sequences, etc. It may also involve techniques such as the three-dimensional modeling of biomolecules and biological systems. This division of the biotech sector is the place where computer sciences and health sciences meet and Alberta's strengths in both those areas have made this province a natural for a burgeoning bioinformatics industry.

The senior company in this area is BioTools Incorporated, a privately held company dedicated to producing bioinformatics analysis software. Founded in 1995 by four University of Alberta professors, BioTools has established itself in the bioinformatics industry by offering quality software products, and software consulting and contractual services.

Chenomx was formed in late 2000 to complete and market the magnetic resonance diagnostic (NMR) technology pioneered by BioTools. In the mid-1990s, two of BioTools' founders, Drs. David Wishart and Brian Sykes, considered using NMR spectroscopy as a tool for determining health status by looking at metabolites in urine. They began to develop software to automatically interpret the spectra created by NMR spectrometers.

The establishment of Chenomx as a separate entity has allowed its development team to focus on developing and commercializing its Eclipse software, which helps scientists correlate metabolic responses with pathology, toxicity, drug efficacy and

genetics. Chenomx's success has attracted equity investment from American science equipment supplier Varian, Inc.

Edmonton-based Celonex operates a life sciences division in addition to its pharmaceutical division. While the pharmaceuticals division is currently working in the area of hypertension and its associated diseases, such as chronic high blood pressure, heart attack, stroke, kidney failure, glaucoma and diabetes, the life sciences division specializes in the development of new technologies for fast, ultra sensitive, and high-throughput genomics and proteomics analysis. Celonex has developed a unique new microarray platform in CeramiChip™. This new platform can be used for both DNA and protein microarray, and clearly surpasses glass-based platforms in many respects. Using its unique microarray system, Celonex is the only company worldwide that manufactures and commercializes various DNA microarrays for functional genomic studies of many important human viruses.

Project CyberCell is the name of an extensive genetic research project involving U of A and U of C researchers. The goal of Project Cybercell is to understand cellular processes to such a level that they can be computationally recreated – in effect, to develop an accurate simulation of a living cell within the virtual environment of a computer. It is a massive undertaking that, if successful, will have important benefits for medical science. Researchers will be able to forecast cellular reactions and quickly evaluate antibiotics and other drugs. The technology will lead to the creation of cheaper and newer drugs, and will help in the search for cures to many diseases. The team has chosen the uni-cellular *Escherichia coli* (*E. coli*) bacterium as the model for its simulation. Spin-off company, Cybercell Technologies Inc., was created to protect the intellectual property created by Project Cybercell. It is in the process of patenting a variety of data, algorithms and code for Project Cybercell.

It is highly possible that the companies described will turn to the U of C's new centre of excellence – the Visual Genomics Centre. Funded by the public and private sector, including title donor Sun Microsystems, the Centre will benefit students, industry collaborators and scientists studying a broad range of diseases, including cancer, lupus and Alzheimer's. The most unique feature of the Centre is its fully immersive display environment with four projection walls – the first of its kind in the world. The CAVE, as it's called, will provide scientists with a three-dimensional model of biological systems. Ultimately, Centre director Dr. Christoph Sensen believes the CAVE's virtual environment will reduce the need for lab animals. **BZ**



The Colour of Money



On the medical side, the development of a pharmaceutical drug is a game of life and death – success could benefit potential millions of people suffering illness. On the business side, it's a strategic game of patience and vision for those who invest in the sector.

Alberta's biotech leaders face their business challenges with a resounding theme of creativity and faith in what they term as good science – embracing the odds in a challenging industry because of the potential for growth and high return on investment.

Raising the funds needed for initial research and development, and the pre-clinical and clinical trials to follow, is a massive concern in the biotech industry. Alberta is fortunate to have a variety of government funders (see sidebar) which are of greatest support in early research and development stages. Savvy biotech entrepreneurs build on that support to attract funding for the late pre-clinical/early clinical stage, where government funding tapers off. Three such Alberta-based companies found different answers to their financing needs.

Edmonton's BioMS is currently planning for the next phase of an advanced human clinical trial in the development of MPB8298, a synthetic peptide technology for the treatment of multiple sclerosis. Kevin Geise, president and CEO, chose to issue a stock offering to fund the pivotal trials, raising \$9.3 million in early 2004.

FINDING PATIENT, RISK-ORIENTED CAPITAL IS KEY TO SUCCESS FOR ALBERTA'S BIOTECHS

BY KENTON FRIESEN



THE COLOUR OF MONEY

In 1999, when BioMS first licensed the technology, the funding came together rather easily - primarily from Albertan investors. Geise says money was raised through the strength of the technology, conveniently developed part way into the Phase II clinical trial stage by researchers at the University of Alberta over the previous 25 years. The nature of the product and its potential to help the many MS sufferers in Canada and around the world added to its investor appeal. Target annual sales of about \$4 billion US for the potential blockbuster drug (over \$1 billion US in sales annually) keep shareholders and investors interested. Most recently, BioMS has licensed a technology from the University of Alberta named HYC750 for mobilization of stem cells and neutrophils for the treatment of cancer therapy related side-effects.

BioMS began with a private round of financing

that raised \$19 million. Subsequently the company went public and embarked on further financing through exercise of warrants and public offering. The company's working capital is reported at \$20 million.

An Edmonton-based company that has grown healthy without public funding or extensive use of government grants is NAEJA, one of the oldest biotechs in Alberta. Founded in 1987 by Ronald Micetich as a U of A spinoff, the company remained under the name SynPhar as a joint venture partner with Japan's Taiho Pharmaceutical until 1999 when the assets were rolled over into NAEJA and DrisCorp Pharmaceutical was acquired.

Through the transitions, the firm has remained a 100% family-owned affair specializing in early product development in the area of infectious disease.

INSTITUTIONS:

AVAC – AVAC is a not-for-profit, private organization that invests in innovative ideas that add value to agricultural commodities. The organization invests through coaching, knowledge, contacts and financial resources.

AVAC provides mentoring and expertise for realization of commercial success and focuses upon pre-commercialization assistance. www.avactd.com

Alberta Heritage Foundation for Medical Research – Alberta Heritage Foundation for Medical Research (AHFMR) currently provides funding for over 600 researchers and researchers in training at the province's three main universities. The foundation supports a community of researchers who generate knowledge that improves the health and quality of life of Albertans and people throughout the world. AHFMR's commitment is to fund basic, patient, and health research based on international standards of excellence and carried out by new and established investigators and researchers in training.

www.ahfmr.ab.ca

Ingenuity Fund – Alberta Ingenuity is the trade name of the Alberta Heritage Foundation for Science and Engineering Research, established by the Government of Alberta in 2000, with an Act of Legislature that provided an endowment of \$500 million. Interest from the endowment is used to support a balanced, long-term program of science and engineering research based in Alberta.

Alberta Ingenuity operates at arm's-length from government, is governed by a board of trustees, and headed by a president/CEO. www.albertaingenuity.ca

Business Development Bank – The Business Development Bank of Canada (BDC) provides small and medium-sized businesses with flexible financing, affordable consulting services and venture capital. BDC supports the needs of entrepreneurs at every stage of growth. www.bdc.ca

FACILITATION PROGRAMS:

Deal Generator – As a Flagship Initiative of the Greater Edmonton Competitiveness Strategy, angel investors, entrepreneurs and professional service providers have joined Economic Development Edmonton in developing the Deal Generator program. They are committed to delivering a credible, high-quality process for generating early-stage enterprise deals. Deal Generator is open for business with participants from across Alberta.

Quite simply, Deal Generator exists to help make deals happen. Entrepreneurs need to develop their business ideas into investment opportunities that angel investors want. To help innovators become business people, professional service providers have to be ready, willing and able to work with them to develop first-rate business plans and pitches. Last, but certainly not least, angel investors need mechanisms to enable them to identify and screen investment opportunities. www.edmonton.com

Concept to Capital – Increase your chance of success in securing capital investment with Calgary Technologies Inc.'s Concept to Capital program. This intensive, 12-week program is designed to help emerging technology companies refine their winning business plan presentation and secure early-stage financing from investors. www.calgarytechnologies.com

Alberta California Venture Channel (ACVC) – Alberta California Venture Channel is a concept aimed at partnering the expertise and larger capital pools that exist in California with entrepreneurs and investors from Alberta that might be missing elements of their current deal (i.e. need to raise more capital, create American markets, better advisory boards). www.venturealberta.com/acvc

While much of the discovery and early development of drugs in Alberta is done in university labs, NAEJA has found a way to operate rather independently and in the complete absence of venture capital. A contract research division was established to provide financing for the ongoing internal research. Another source of funding is the out-licensing of various products the company has taken up to the clinical stage. Agreements for upfront payment and milestone payments help the short-term cash flow, with the added benefit of being kept in the loop through to the approval of the technology. NAEJA's partnering with companies that need a pipeline of products and have existing clinical trial and marketing teams is a win-win.

Long-term financing will come from the royalties received from approved out-licensed drugs.

In 2002, Isotechnika became the hottest name in Canada's biotech sector, when it secured a deal with Roche that was touted as the largest Canadian deal ever conducted between a pharmaceutical company and a biotech. While the expectations are enormous, chairman and CEO Robert Foster remains unperturbed. He says his immunosuppressive organ transplant drugs ISA247 is so far superior to what is currently available it will, if approved, render the current treatment ineffective or even unethical.

Assuming effective commercialization, the transplantation market should mean sales of significantly more than \$1 billion US annually, says Foster.

The process of raising funds for research was initially slow and Foster didn't mentally register the magnitude of it until his company had guaranteed loans equalling \$800,000. That was 1993. At the end of 2001, Isotechnika had cash reserves of \$53.3 million. And April of 2002 saw the signing of the co-development deal with industry giant, Roche. In 2004, the Roche agreement was amended to give Isotechnika back the rights to all non-transplant applications, while Roche would maintain the commercialization rights for ISA247 for transplantation. Isotechnika has projected that the new arrangement could mean as much as \$245 million in payments from Roche, as compared to the previous figure of \$215 million, while still allowing Isotechnika to explore market opportunities outside of transplantation.

The financing came together for the company, but Foster says it is a serious challenge for all biotech companies in the province. "There's not a lot of access to venture capital and there's no access to labour-sponsored venture funds either.

"But if you believe in what you're doing, you just push forward," says Foster. **BZ**

LICENSED TO SELL

THE FOLLOWING IS AN EXCERPT FROM A COMPREHENSIVE ARTICLE ENTITLED "BASIC DRUG AND BIOTECH LICENSING ISSUES"

PREPARED BY GORDON SUSTRIK AND DAVID PARKATTI OF BENNETT JONES LLP.

In the ever-advancing field of biotechnology, licensing has assumed an increasingly important role as small biotech ventures, large pharmaceutical firms, universities and hospitals alike seek to develop their technologies. The fact that biotech products are so technically complicated, and take so long and so much money to properly develop and commercialize, requires some coordination or conflict resolution between industry participants. Licensing, through its inherent flexibility to fix use rights and obligations as mutually desired, allows the participants to ensure their respective interests are met.

Whatever their objectives, parties who engage in biotech licensing have to be aware of the basic drafting issues that surround this practice, to fully obtain its advantages. This is not as straightforward a task as it sounds. In the field of biotechnology, licensing has come to encompass not only conventional royalty arrangements, but also varying types of collaborative arrangements. The challenge, then, for industry participants is to avoid being overwhelmed by the multitudinous drafting nuances that may affect a licensing relationship.

Grant of Licence

In any licence, the sections detailing the grant of rights form the crux of the agreement, as that is where questions pertaining to what is being transferred and the extent of the transfer are answered. In the case of biotechnology, clearly defining the subject-matter of the licence, exclusivity rights, territory covered, and licence term can be particularly important.

Subject Matter

A licence is fundamentally a grant of rights, and the grant clause is of key importance in establishing the boundaries of the licence. For licensors in general, the aim will be to use sufficiently narrow definitions to avoid reducing the value of key assets. Conversely for the licensee, the aim will be to obtain a wide definition to maximize flexibility.

Exclusivity

In addition to the subject matter that lies at the heart of the licence grant, decisions also have to be made regarding whether the licence grant will be exclusive or non-exclusive, and if exclusive, the extent of the exclusivity. Certain automatic rights and obligations sometimes associated with exclusive licences warrant consideration. One current debate concerns the American law principle that exclusive licensees have an implicit duty to use "best

efforts" to exploit the exclusive licence. Some U.S. courts have chosen not to apply this principle where minimum guarantees or advance royalty payments are made.¹ Other considerations arise in respect of *non-exclusive* licences, such as the inclusion or non-inclusion of a most-favoured-licencee provision, which guarantees a licensee terms that are at least as good as those offered to other licensees. Licensors will want to avoid inclusion if possible, whereas licensees want the opposite.²

A licence requiring some exclusivity does not mandate that *everything* be granted exclusively. Depending on how fields of use and territory clauses are drafted, different restrictions surrounding exclusivity can be used to customize a licensee's rights within different contexts. For example, one may grant an exclusive licence to develop a drug for a specific indication within North America, and a non-exclusive licence for another indication elsewhere.³

Territory

The extent to which a licensee may use licensed subject matter is also circumscribed by geography. The territory covered by the licence should be precisely defined. Competition law may limit the licensor's ability to control the licensee's commercial activities outside such designated territory. A rule of law known as the "doctrine of exhaustion", whereby exclusive licensees are barred from preventing the importation of "gray" or "parallel" products from outside their exclusive territories, can be particularly troublesome.⁴ Finally, the licensor should realize that where patent protection is limited to only a certain number of countries, know-how may still sufficiently ground the subject matter of a licence.⁵

Term

Licence rights to subject matter should also be limited temporally. While the exact duration of a licence is a detail which the parties must decide based on their circumstances, licensees and licensors may have an interest in including clauses which enable the licence's extension, such as rights of renewal or even automatic roll-overs, so as protect against serious disruption of their respective business plans.

The intent of the above discussion has been to set out, at a basic level, some of the key issues that will be encountered when negotiating and drafting biotech licence agreements. Obviously, the more time and effort that is put into clearly defining the rights and obligations of the parties, the more efficient and mutually beneficial their arrangement will be. **BZ**

1. H.J. Schwartz and J.B. Lattimore, "So, You Received a Big Check, But it Could Have Been a Really Big Check", *les Nouvelles*, September 2002, page 95 at 95
2. M.R. McGurk, "Problems of Careless Drafting", *les Nouvelles*, September 1997, Page 148 at 149
3. S. Middlemiss & R. Sadleir, "Collaborations and Licensing - Key Legal Issues", *Bio-Science Law Review*, August 30, 2001
4. J.R.C. Brown, "Parallel Imports, Exhaustion of Rights in EI", *les Nouvelles*, June 1997, Page 49 at 49
5. Middlemiss, *supra*

ALBERTA'S BIOTECH LEADERS

Among the many dynamic businesses functioning in Alberta's biotechnology community, several have achieved significant recognition for the milestones which they have marked. These seven companies are at the forefront of discovery in the province – their leadership demonstrates the breadth of potentiality for the sector.

An Arsenal of Therapies

Altachem Pharma Ltd is working on the next generation cancer treatment that will be more patient friendly.

Headquartered in Edmonton, Alberta with wholly owned subsidiaries in Shanghai, China, Altachem Pharma Ltd is a publicly traded (AAF TSXV) pharmaceutical company. Altachem's technologies are expected in the future to join the arsenal in the fight against HIV/AIDS, cancer and skin diseases.

Altachem's photodynamic laser therapy will be used to battle prostate cancer in a much less invasive way than traditional methods. The injected drug attaches itself to the cancer cell and is then activated by a form of sonolight. Altachem's sonolight therapy, which will also be used to treat psoriasis, acne, and other skin disorders, is now in late pre-clinical trials.

ACP-HIP, now in clinical trials, has been found to inhibit the proliferation of AIDS-causing HIV cells, and to inhibit the spread of Kaposi's sarcoma, an AIDS-related cancer.

It is currently believed that one of the origins of cancer is due to lapses of the body's immune system to detect cancer cells as invaders of the host. Altachem believes its CDK, an immunomodulator, will not only reduce tumor growth but will limit the spread of the cancer to other organs. The product is in early stage pre-clinical work.

Altachem's manufacturing plant in Shanghai produces pellet core particles used in slow controlled release dosage forms. Altachem has added another production line to the Shanghai facility to

manufacture its Bionex disinfectant and has the capacity to add additional lines to meet market demands for its products.

For more information, go to www.altachempharma.com

Refining Oats for Health

Specializing in the development and commercialization of natural products for the medical and animal health industries, Ceapro has carved out a unique and profitable niche for itself. The development of technology that allows for the more efficient extraction of active ingredients has established the company as both performance driven and quality motivated.

In 1999, Dr. Mark Redmond and his team of highly experienced and dedicated professionals successfully extracted a range of medically active compounds from oats. These compounds have been used by the company to commercialize a range of cosmetic and personal care products as well as pharmaceutical and veterinary applications.

Since then, Ceapro has demonstrated its ability to significantly increase its total revenues, net income and gross margin. In 2004, the company was named one of Alberta's fastest growing companies by *Alberta Venture* magazine. Trading on the TSX (CZO), Ceapro has the market cap to ensure it maximizes its product opportunities. With the development of products such as AccuScreen, a diabetes test kit for the early detection of type II diabetes and impaired glucose tolerance, the company is confident it can sustain its growth and financial performance.

Dr. Redmond, Ceapro's president and CEO, sees the potential for continued success. "We believe that we can sustain our growth with products like AccuScreen and the development of other new technologies and applications being major contributors to that growth."

For more information, go to www.ceapro.com

Naturally Better

University of Alberta spin-off CV Technologies started out in Edmonton in 1992 as a pharmaceutical development company. By 1995, CV Technologies had shifted its focus to developing its own technology

platform and natural therapeutic products. Current president and CEO Dr. Jacqueline Shan and her colleagues developed ChemBioPrint, a patented technology for the discovery development and standardization of natural therapeutic products. It uses a combination of chemical and pharmacological "fingerprinting" that ensures each batch of product delivers verifiable and provable health benefits, and is consistent with previous batches. ChemBioPrint is the process that allowed the company to produce the cold and flu-fighting compound COLD-FX in 1996 and, eventually, five other natural health products that are also on the market. CV Technologies' most recent product release is REMEMBER-FX, a natural health product that enhances memory function and restores mental alertness.

Dr. Shan is bullish on CV's future. "My vision is to become the number one or number two natural health business in the world," she says. "Hopefully, some day we'll become a billion-dollar company."

The publicly traded company (CVQ-TSXV) is making inroads towards that goal. An aggressive commercialization plan and scientifically proven products are bearing fruit. Sales in the first quarter of fiscal year 2004 were \$1.6 million, up 349% from the same quarter of the year before, and almost equal to sales for all of fiscal 2003. CV Technologies showed a profit of \$265,679, making it the first profitable quarter in company history.

For more information, go to www.cvtechnologies.com

A Passion for Research

Global International Quality Medical Research Inc. (Global IQ™) is a full service clinical research organization. It aims to provide the highest quality, most rapid and cost effective process for the completion of clinical studies.

Global IQ™'s vision is to take clients from the start of Phase I research studies to the completion of Phase III studies in only 1,000 days – without any reduction in quality of data or results. The company is highly innovative in streamlining trial operations; for example, it has integrated electronic management into traditional

trial process. A client's profitability can be greatly increased by a longer drug patent period, as a result of the speed of the trial.

Unlike larger research firms with dozens of offices across the globe, Global IQ™ provides a more personal approach to its sponsors. Clients regularly deal with senior management during all phases of research – it speaks of a passion for service and quality that is reflected throughout the company.

"We think we can offer a high-level of service with global capabilities, in a more approachable, one-to-one atmosphere. It's an environment that benefits everyone involved in the studies we do – our clients, investigators and patients," says Paul Braconnier, president and CEO of Global IQ™.

For more information, go to www.globaliq.com.

Overcoming Rejection

Founded in 1993 by Dr. Robert Foster, Isotechnika Inc. is an international biopharmaceutical company headquartered in Edmonton and trading on the S&P/TSX Composite under the symbol ISA. The company focuses on the discovery and development of novel immunosuppressive therapeutics that are safer than currently available treatments. A team of world-class scientists, led by Dr. Randall Yatscoff, are building an impressive stable of immunosuppressive drug candidates for use in the prevention of organ rejection in transplantation and in the treatment of auto-immune diseases.

Dr. Robert Foster, Isotechnika's chairman & CEO, credits the company's keen focus in the field of immunosuppression and strong leadership abilities to the continued success and fast growth of the company. "Our in-house expertise has enabled the company to advance its corporate strategy and build a strong immunosuppressive drug pipeline," stated Dr. Foster. "Isotechnika has positioned itself as an internationally recognized biopharmaceutical company and we look forward to the company's future successes."

That future success will come from a three-prong approach. Isotechnika's current goals include a focus on the clinical development of its three drug candidates:

ISA247, TAFA-93 and TKB662. Secondly, the company intends to continue to utilize its in-house expertise in immunology, pharmaceuticals and medicinal chemistry to develop and enhance its drug pipeline.

Finally, Isotechnika plans to establish and maintain a strong intellectual property portfolio. Given the importance of intellectual property in the drug industry, the company recognizes it must continue to investigate patentable and commercially viable products in the immunomodulating field.

For more information, go to www.isotechnika.com.

Cancer Fighter

Founded in 1998, Oncolytics Biotech Inc. is focused on developing its proprietary product, REOLYSIN®, as a potential therapy for up to two-thirds of all human cancers.

Based on discoveries made at the University of Calgary, Oncolytics is exploring the use of the Respiratory Enteric Orphan virus, or reovirus, in cancer treatment. Researchers discovered the virus could infect and selectively kill cells with a genetic mutation along the Ras pathway, a signalling pathway in the cell. Normal cells without this mutation prevent the reovirus from multiplying. In cancer cells with this mutation, the reovirus multiplies, eventually killing the cell and spreading to surrounding cells – continuing the process until there are no longer any cancer cells to infect.

Oncolytics has successfully completed two human clinical studies in Canada, has received approval for a systemic (intravenous) administration trial in the United Kingdom and has a research collaboration with the National Cancer Institute in the U.S. to conduct multiple human clinical trials with REOLYSIN®.

"With its potential for use in up to two-thirds of all human cancers, Oncolytics is optimistic about the potential for REOLYSIN® as a broad-based cancer therapeutic," says Dr. Brad Thompson, Oncolytics President and CEO.

For more information, go to www.oncolyticsbiotech.com.

Turning Plants into Proteins

Founded in 1994 as a spinout from the University of Calgary, SemBioSys was built on a revolutionary means of producing and purifying proteins from plant seeds (biologics), a technology developed by Dr. Maurice Moloney. Proteins grown by SemBioSys have pharmaceutical applications as treatments for everything from diabetes to hair loss. The technology itself has wide applications that include not only ingredients for medicine but cosmetics, food and livestock feed additives.

Under the leadership of Andrew Baum, president and CEO, SemBioSys is at the forefront of developing technologies that add value to Alberta's agricultural commodities, and as such, has attracted the support and praise of such organizations as AVAC. In addition, SemBioSys' efficient and quality-focused process enables the commercialization of life-saving drugs that otherwise would not be available.

Based on its proprietary oleosin/oil-body-based Stratosome™ Biologics System, SemBioSys is developing a strong pipeline of biologics and other proteins through manufacturing partnerships and co-development agreements that, combined with the expected short-term revenue generated by the company's personal care division, position SemBioSys for immediate and sustained growth. SemBioSys' industry partners include Syngenta, Metabolic Pharmaceuticals and a multinational fine chemical manufacturer. The privately-held company's major shareholders include Bay City Capital, Dow AgroSciences, Royal Bank Ventures and Venture West Capital Ltd., among others.

For more information, go to www.sembiosys.com. BZ

BIOALBERTA MEMBERS

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