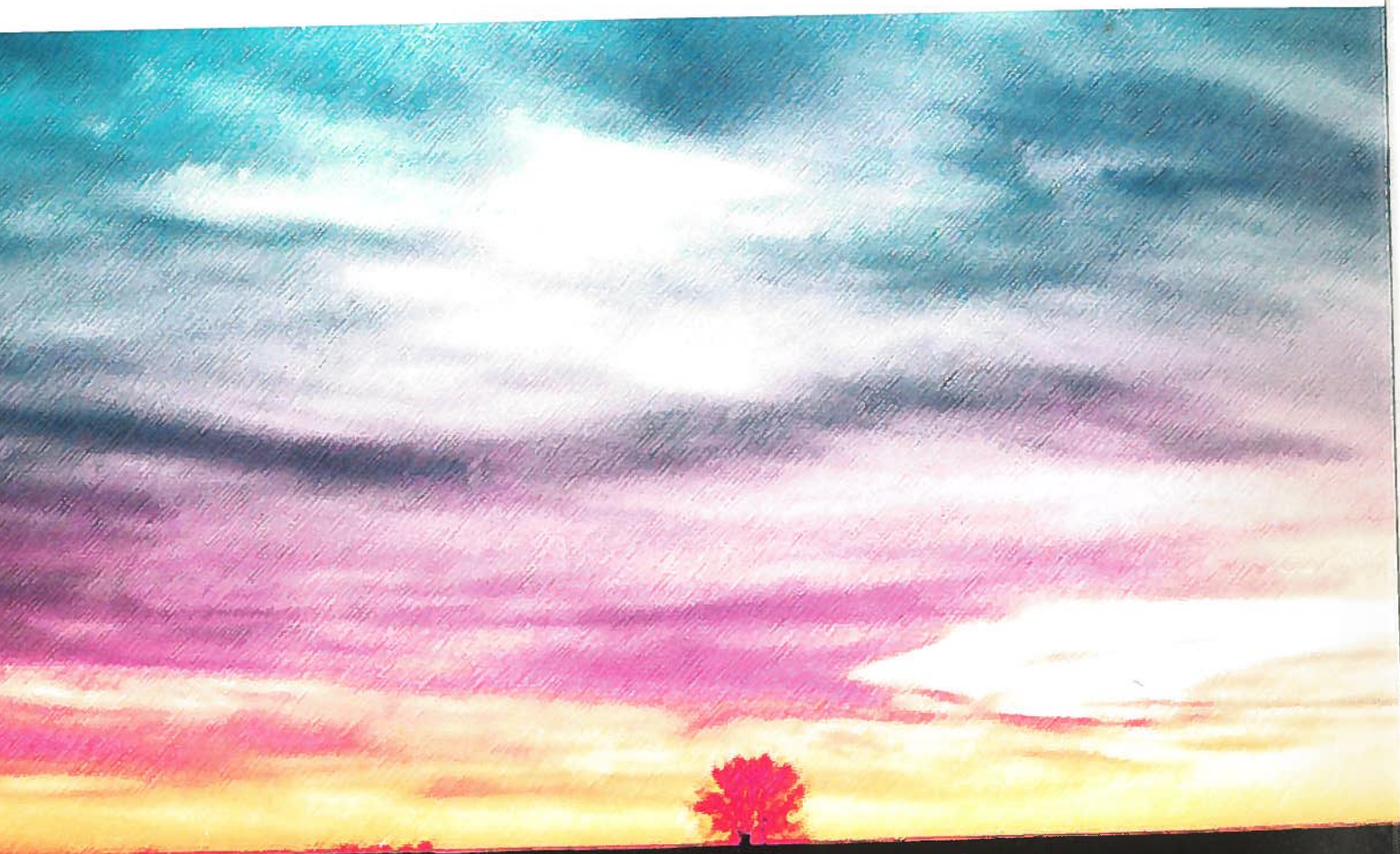
1998/1999 Annual Report

VIDO

ALLOWS SCIENTISTS THE ABILITY TO STUDY, DESIGN AND BUILD AT THE MOLECULAR LEVEL

veterinary infectious disease organization



mandate

MANDATE

To Serve the Canadian Livestock and Poultry Industry by:

Conducting animal health-related research
Communicating livestock management techniques and information
Facilitating the transfer of technology for international commercial development

The following individuals, groups, and agencies contributed funds to VIDO over the course of the past fiscal year through donations, grants, or contracts. Their support is acknowledged and greatly appreciated.

Agriculture Canada
Agri-Food Innovation Fund
Ag-West Biotech Inc.
Alberta Agriculture Research Institute
Alberta Cattle Commission
Alberta Chicken Producers
Alberta Milk Producers
Alberta Pork Producers Development Corporation
Buyer Corporation
Beef Cattle Industry Development Fund
Beef Industry Development Fund
BIOSTAR Inc.
British Columbia Investment Agriculture Foundation
BC Hog Marketing Commission
Canada-Alberta Beef Industry Development Fund
Canadian Bacterial Diseases Network
Canadian Turkey Marketing Agency
Dairy Farmers of Canada
Dairy Farmers of Ontario
Government of Canada - Department of Western Economic Diversification
Dr. Norman Habermehl
Health Services Utilization and Research Commission
Human Frontier Science Program
Kamloops Stockmen's Association
Manitoba Cattle Producers Association
Manitoba Pork Council
Medical Research Council
Natural Sciences & Engineering Research Council of Canada
Ontario Cattlemen's Association
Ontario Pork Producers' Marketing Board
Province of Alberta - Alberta Agriculture, Food, and Rural Development
Province of British Columbia - Ministry of Agriculture, Fisheries, & Food
Province of Manitoba - Manitoba Agriculture
Saskatchewan Agriculture Development Fund
Saskatchewan Beef Development Board
Saskatchewan Cattle Marketing Deductions Fund
Saskatchewan Economic & Co-operative Development
Saskatchewan Health Research Board
Saskatchewan Horned Cattle Trust Fund
South Costal Dairy Education Association
Sask Pork
Swine Improvement Services Co-operative
TAIGA BioActives Inc.
Transgene
Vetrepharm Canada Inc.
World Health Organization

VIDO

VIDO'S GOALS

To serve and assist the economic competitiveness of the livestock industry through research on the common infectious diseases of animals and poultry.

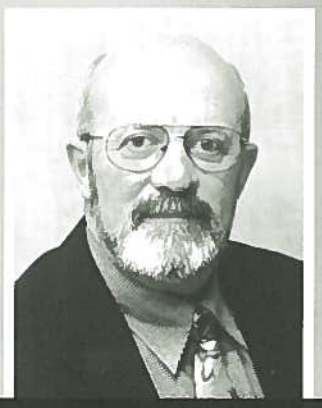
To provide information leading to safe and effective animal health preventative medicine programs which enhance animal care through improved management and performance of livestock.

To identify opportunities to utilize VIDO's livestock research to improve human and companion animal health.

To maximize funding by enhanced visibility and development of innovative communication programs with all organizations that provide support to VIDO.

To transfer technology to the biological industry to enhance its commercial application for the benefit of the Canadian livestock producers and to provide financial stability to VIDO.

To manage its financial, educational, and human resource efforts to ensure long-term benefits to the organization's stakeholders.



CHAIR'S REPORT

Dennis Billo
Chair

Don Winslow
Vice-Chair

These are indeed exciting times for everyone at VIDO. The dawn of the new millennium has VIDO poised to take on an expanded role as intermediary between academia and industry. We are certainly recognized as one of the premiere animal disease research institutes in Canada and VIDO remains committed to enhancing the competitiveness of the Canadian livestock industry.

Although VIDO's primary goal remains the development of specific veterinary vaccines for poultry and livestock, our past work has also led us to identify, develop, and patent complementary vaccine delivery technologies. Many of these technologies are adaptable to other areas of need such as human medicine. The spin-off benefits are obvious and the protection of intellectual property is key to capitalizing on these on-going successes.

The growing resistance of pathogenic organisms to antibiotics means efficacious vaccines and delivery systems will become more important and economically advantageous. In addition, the cross-over between infectious disease and food safety areas means that consumers will become increasingly vocal and insistent that alternatives to antibiotic use be found.

The complexity of this research and development has necessitated a move to a new level of expertise. Using the tools of molecular biology, genomics, immunology, pharmacy, and even engineering, it is evident that a multi-disciplinary approach to research is crucial to VIDO's long-term success.

This requires space, equipment, and additional expertise that we currently do not have. An increasing number of collaborative licensing and research agreements with national and international pharmaceutical companies further taxes our scientists and infrastructure.

For all these reasons, it is imperative that we do not allow VIDO's momentum to slow. Acquiring a long-term commitment for core funding is the important first step. However, doubling the size of our current facilities in the very near term is key to advancing the time sensitive technologies that offer such important and exciting prospects for VIDO and Canadian livestock producers. As I leave VIDO's Board of Directors, it is my fervent wish that all of our supporters in industry and government recognize the need, and especially the opportunity, that lies ahead.

Coincidentally, the Year 2000 also marks VIDO's 25th anniversary. I believe that VIDO's founding father, Dr. Chris Bigland, would applaud VIDO's achievements to date, but, more importantly, would vigorously endorse the course that is being set for the next quarter century.

I sincerely thank the staff and the Management Team for their continued dedication and hard work. The support I received from the Board of Directors was invaluable.

Respectfully submitted,

Dennis J. Billo

... we do not want to rest on our laurels but

look forward to the next 25 years and ensure that we continue to make significant contributions to our stakeholders

– the livestock industry, the biopharmaceutical industry, governments, and individual Canadians who are the beneficiaries of our research activities.

Lorne Babiuk
Director

DIRECTOR'S REPORT

As the world enters a new Millennium, VIDO also has reached a significant milestone in its history by helping the livestock industry in controlling infectious diseases for a quarter of a century. As VIDO approaches its 25th Anniversary, it is time to reflect back on our humble beginnings and to celebrate the many successes that have brought us to this important milestone. However, we do not want to rest on our laurels but look forward to the next 25 years and ensure that we continue to make significant contributions to our stakeholders – the livestock industry, the biopharmaceutical industry, governments, and individual Canadians who are the beneficiaries of our research activities.

Last year, we focused on globalization and how VIDO was positioning itself to capture and contribute to opportunities both nationally and internationally. Today, we continue our collaborative interactions with research organizations and companies around the world. VIDO has approximately 30 research or licensing agreements with 20 different organizations and companies around the world. These agreements range from direct contracts for product testing, agreements to develop specific products for which we have already established the proof-of-principle, and finally to high risk basic research projects which have a potential for generating novel products or platform technologies that can be used in a large number of different products in the future. This mix of agreements allows our scientists to be at the leading ledge of developing technology and working with different scientists and companies to capitalize on synergies of expertise and facilities as well as gain a much better appreciation of the importance of achieving agreed-to milestones. This balanced approach helps us develop a strong pipeline of products that will benefit our stakeholders in the future.

Although it is over 30 years since the Surgeon General of the United States indicated that infectious diseases were no longer a threat to society; today, we recognize that infectious diseases are amongst the major impediments to livestock production and human health. For example, bovine respiratory disease still causes approximately $1 billion in economic losses annually in North America. Similarly, mastitis in dairy cattle exceeds $3 billion and enteric infections in calves remain the major cause of death losses in animals prior to weaning. In human medicine the World Health Organization recently estimated that deaths due to infectious diseases (> than 3 million from respiratory disease, 1.5 million from tuberculosis, 1 million from malaria, > than 2 million from enteric diseases, > than 2 million from HIV, etc.) exceeds even cardiovascular disease. These statistics clearly indicate the importance of developing better preventative measures in controlling these diseases if we hope to reduce the suffering caused by infectious diseases in humans and animals. The emergence of antibiotic resistance and the transmission of infectious agents from livestock to humans is becoming a major concern. Canada prides itself on the quality and safety of its food supply. Unfortunately, quality and safety of food produced by the Canadian livestock industry can be

dramatically influenced by infectious diseases which have their origin in live animals. The food industry has stated on many occasions that their greatest challenge is re-assuring consumers the products they buy are safe. *E. coli* 0157: H7, *Salmonella enteriditis*, Campylobacter, etc. are a few examples which not only risk human lives, but can also have a dramatic impact on the acceptability of the products and can influence our export market. Prevention of these infections in animals by vaccination or by novel therapeutic modalities will not only reduce transmission of these pathogens in our food, but will also lead to reduction in use of antibiotics in food products. This may also reduce development of antibiotic resistance globally as well as treat animals for which no therapeutic agents are presently available. VIDO is convinced that disease prevention in animals must become a top priority to ensure a safe food supply.

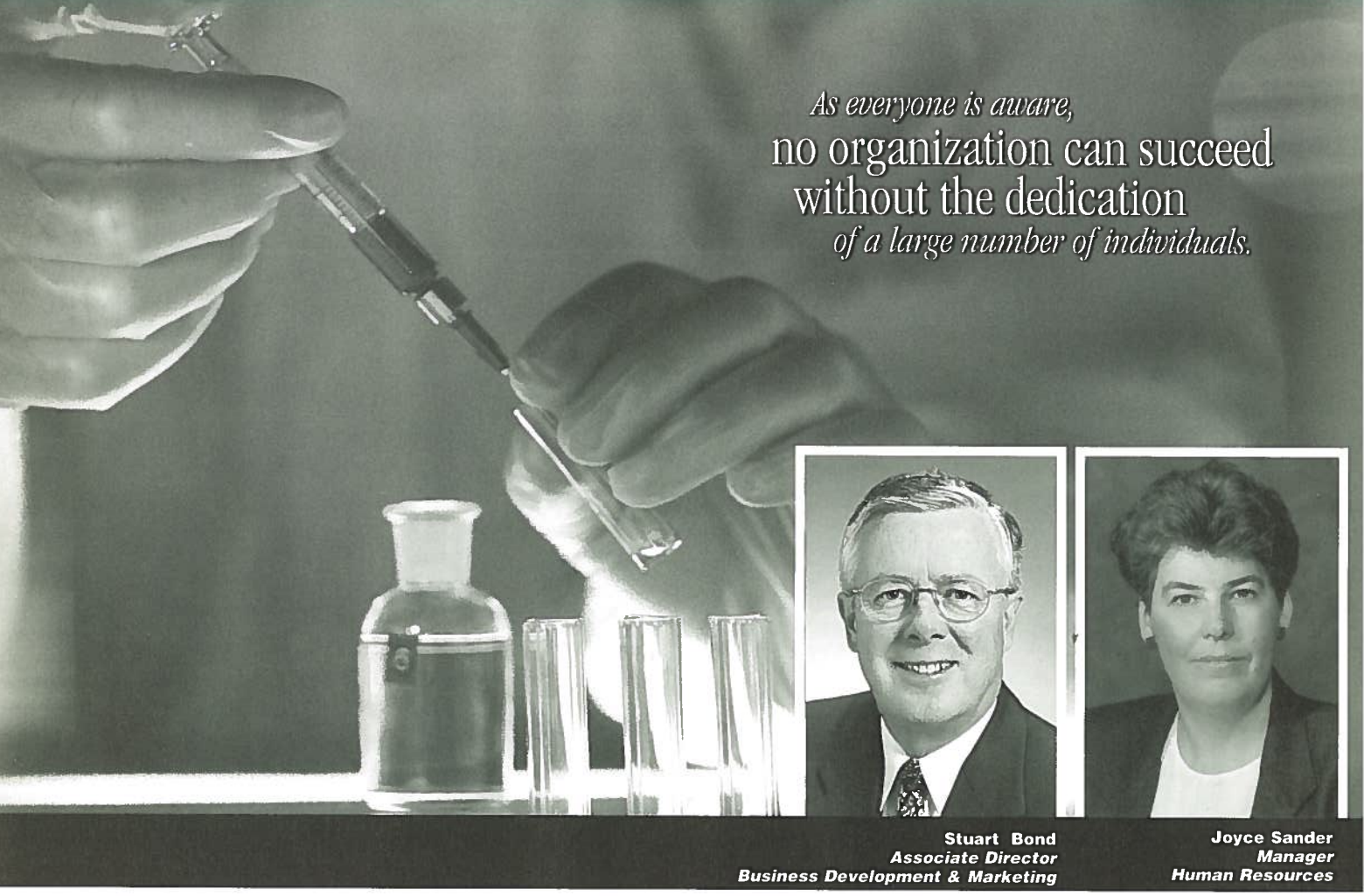
To date, the study of human and animal health has been generally carried out in isolation, however, we firmly believe that combining researchers with interest in infectious diseases in humans and animals is long overdue and will allow both disciplines to benefit from each other. VIDO is proposing to capitalize on comparative medicine approaches and we feel that this will not only be unique in Canada and indeed in North America, but will be critical for ensuring that our food is safe. Our motto is "a healthy animal provides safe food for a healthy society."

Based on the common features of infectious diseases of animals and humans and the convergence of technologies such as genomics and bioinformatics, in order to capitalize on the opportunities and ensure that VIDO achieves its goal, we propose to enhance our vaccine development capabilities by constructing and equipping an addition to the existing VIDO building to enable genomics, new delivery systems, new diagnostics, and therapeutic research to be increased in our program, as well as to link advances in veterinary and human medicine. The total cost of the project is approximately $13 million of which we are seeking funding through a partnership with the Canadian Foundation for Innovation, the Province of Saskatchewan, and the Province of Alberta. We hope to finalize this funding partnership by the middle of 2000 and begin construction shortly thereafter. This will allow us to recruit world-class scientists with expertise in genomics, bioinformatics, vaccine formulation, and strengthen our existing core competencies in the pathogenesis of infectious diseases and vaccine development using biotechnology. The addition of this expertise will be pivotal in ensuring VIDO remains a global leader in development of novel therapeutics and preventative measures for livestock and human infectious diseases.

Our philosophy has always included the belief that the development of new technologies for disease prevention must be based on sound science and an understanding of the disease process. The addition of the new laboratories and expertise will help support this philosophy and will benefit society.

Although the future is extremely exciting and the opportunities for Canada are enormous, VIDO faces some important hurdles which must be overcome if we hope to continue to be successful in these ventures. The first concern is the diminishing supply of core funding – the overhead money that pays wages of the scientists, management team, and other activities which are not normally provided for by research grants. During this next year, VIDO will be making a concerted effort in obtaining core funding for VIDO's operations. This will be very significant since VIDO has never had any core funding in its entire 25-year history. However, the time has come when core funding is critical if VIDO is to survive. The reason for this is that most funding agencies such as the Medical Research Council or newly created Canadian Institutes of Health Research and the Natural Sciences and Engineering Research Council, etc. do not, under any circumstances, pay for scientists salaries who are conducting the research. Similarly, most other organizations are now focusing more on project funding and not on core funding. If organizations like VIDO hope to survive in the new Millennium, there will need to be recognition by our funding partners, especially the Provincial Government, that core funding is critical.

For any organization to succeed it requires a very effective marketing and communications plan. Our major goals and strategies will continue to market VIDO to all our stakeholders and to demonstrate how VIDO operates, what are our successes, as well as our failures. We feel that this open type of communication is critical if we hope to ensure that our stakeholders continue investing in us. Livestock producers have been and will continue to be the primary targets for VIDO's research and, indeed, VIDO considers itself to be the research arm of the livestock industry where it responds to industry's needs to make them more competitive. In addition to improving productivity, improving food quality and safety of livestock products will greatly improve the potential export markets for Canadian livestock products. VIDO's goal is to continue to assist the livestock industry through technology transfer and educational activities. It is our intent to maintain two-way communications between various producer industry groups on a regular basis to inform them of the research accomplishments that we are making on their behalf and to get input from them regarding the types of research activities that we should be carrying out for their benefit. In addition to the livestock industry, another major stakeholder is the biopharmaceutical industry. Our philosophy will be to maintain linkages with the



Stuart Bond
Associate Director
Business Development & Marketing

Joyce Sander
Manager
Human Resources

biopharmaceutical industry, to establish linkages early in the development pathway of specific products and technology, and to work closely with these companies throughout the development process to ensure that the least amount of interruption in transferring the technology to the market place occurs. By establishing the market profile before the research is initiated, the development pathway is clear and our collaborators have already identified the market. This ensures that the end user will be considered in each project conducted at VIDO. Furthermore, this will have greater potential returns to VIDO in the form of licensing agreements and royalties.

As everyone is aware, no organization can succeed without the dedication of a large number of individuals. VIDO is fortunate to have an extremely dedicated management team, Board of Directors, and, most importantly, staff that are willing to go the extra mile. The dedication of the staff has allowed us to meet and exceed our specific milestones this past year. This will continue to be critical as we strengthen our relationships with a variety of different stakeholders and financial supporters. Since our goal is to establish long-term relationships with our clients, exceeding the customer's expectation is crucial for continued and repeat business. We are happy to report that many of the contracts we have are with organizations with which we started by collaborating on a small project which has grown to where we have established a long-term relationship in a number of projects.

Since VIDO is a not-for-profit organization and we do not pay our Board of Directors, I would like to specifically thank this group of dedicated individuals who provide VIDO Management with the guidance and support that is required. We are especially grateful for their direction and counsel during this past year as we were designing our future strategy and contemplating the expansion activities. This has been critical to our well thought-out strategy and will ensure success for many years to come and ensure that we continue evolving into an internationally recognized research institute. This vision will benefit not only the livestock industry, but our entire society.

SCIENCE REPORT

Andrew Potter
Associate Director
Science

Infectious diseases remain the major causes of death and economic losses in humans and animals. For example, mastitis alone costs the North American livestock industry $3-5 billion annually. Bovine respiratory diseases cost the industry between $500M and $1B annually; and enteric infections account for about $300 M of losses. With emerging resistance to antibiotics, these costs will soon increase dramatically. One way to reduce disease losses is to prevent diseases by vaccination. Immunization has already had a greater impact on the economics of livestock production and on animal suffering than all other therapeutic and prophylactic treatments combined. Yet, today's vaccines are still imperfect in many respects including efficacy.

VIDO's philosophy towards animal health research has always included the belief that the development of new technologies for disease prevention must be based upon sound science and an understanding of the disease process. Such research is typically carried out in a non-competitive fashion wherever possible, resulting in partnerships with individuals and organizations internationally. Over the past 25 years we have built expertise in several core areas of activity, namely disease pathogenesis and epidemiology, molecular biology, and vaccine formulation/delivery. The Organization is viewed as a world-leader in the development of new technologies for animal vaccines as well as methods for their use. This is due not only to the fundamental research carried out, but also the generation of intellectual property, the latter being based largely upon the biotechnology-related activities of the past 15 years. The 40 issued patents represents the means by which VIDO technologies are transferred to the private sector so that producers ultimately benefit.

While VIDO's biotechnology activities have resulted in the successful development of several new vaccines, these products are still being formulated by the animal health industry using techniques and materials that are over 50 years old. Likewise, these products are being used in the field with delivery technologies that are out-dated. Thus, there is a need for VIDO to focus its efforts in these two areas, a process that has been initiated through the recruiting of scientists with the appropriate expertise and the development of partnerships with other organizations active in this area.

VIDO has played an important role in ensuring that the animal health industry recognizes the value of biotechnology approaches to disease prevention. However, there are several trends that have emerged recently that are having a significant impact upon how we view animal health. These include:

- Over the past 5 years there has been a convergence of technologies, which effectively means that the same techniques can be used for the development of prophylactic (vaccine) *vs.* therapeutic (drug) products.

- There has also been a convergence of research targets due to the realization that the production of food involves all stakeholders from the farmer through to the consumer. The best example of this is the issue of food safety where we are attempting to lessen the risk of human disease acquired through contaminated foods by vaccination of animals.

- The medical and veterinary communities have also been linked recently by the perception that the decreasing effectiveness of antibiotic therapy in humans is due, in part, to the use of these compounds in animal feed.

- Finally, the human genome-sequencing project has the potential to generate both technologies and information that will be directly applicable to veterinary vaccine development.

These points indicate a need to view animal health from a different perspective than has traditionally been the case. Specifically, there is a need to bring together the human and animal research communities since both the technologies as well as the targets are converging, but this will not happen without a concerted effort. VIDO is in an excellent position to bridge this gap and to capitalize on the resulting outputs.

In order for VIDO to remain competitive in the 21st Century, we are proposing to establish a Vaccine Research Facility, a Centre of Excellence within Canada with strong partnerships between VIDO and other institutions and organizations carrying out complementary work. The complementary expertise, facilities and areas of application of VIDO and groups in the neighboring provinces will result in synergies not possible by the individual members and will ensure that Canada remains a world leader in vaccine research. Over the next 5 years, in addition to completing the current projects, we see a subtle change in our research direction to take advantage of current opportunities. These will include the following:

1. VIDO's present research activities devoted to disease pathogenesis will be continued and strengthened as they form the basis for the generation of our intellectual property. However, we must capitalize on new technologies such as genomics in order to maintain our competitive advantage. Since the medical research community is driving these newer technologies in Canada and elsewhere, we see a need for the veterinary and medical communities to work together towards common goals.

2. Vaccine formulation and delivery will remain a top priority for the Organization. Advances in this area have application in both the veterinary and human fields and there is great potential for us to capitalize on the advances made in the area of human drug delivery.

3. VIDO's research targets will continue to evolve, reflecting the needs of our stakeholders. We are already involved in several projects that span the medical – veterinary areas such as the use of bovine adenovirus for animal and human vaccines as well as human gene therapy, and the development of "food safety" vaccines for *E. coli* 0157:H7 , *Salmonella enteriditis* and Cryptosporidium. VIDO's research on Streptococcal vaccine also has direct application for the development of human vaccines and we will pursue this aggressively through partnerships with groups in Ontario, Manitoba, Saskatchewan, Alberta and British Columbia.

4. VIDO's most valuable "product" has always been information since it forms the basis for all of our intellectual property. Biological information is easier to generate now then at any point in history due to technologies such as genomics and hi-through-put screening. VIDO must strengthen efforts in these areas immediately or we will cease to be relevant.

In order to capitalize on the opportunities described above, there is a need for VIDO to expand both its staff and facilities. Specifically, we will need to recruit scientists with expertise in genomics, bioinformatics and combinatorial chemistry to move into these new areas and we will also need to strengthen existing areas in vaccine formulation, pathogenesis and molecular epidemiology. Wherever possible, this work will be carried out through partnerships with other institutions, but there is a need for key individuals to be physically located at VIDO. Overall, we foresee an increase in staffing levels by approximately 60 people over a 3-5 year period. Expanded facilities are also required in order to ensure that the capabilities of the organization are not hampered by a lack of access to the equipment needed for this research. The design of the existing facility will not permit expansion into areas such as genomics, bioinformatics, etc., due to the unique requirements within these research areas.

In summary, if VIDO is to maintain a leadership position as an animal health research organization, there is a need to rapidly capitalize on new technologies in the fields of genomics and vaccine formulation/delivery. The end product of this research will be platform technologies with application in both the medical and veterinary communities. We believe that VIDO can be the organization that brings these two groups together and benefit society.

Carol Martel
Manager
Financial Operations

FINANCIAL SECTION

AUDITORS' REPORT

To the Board of Directors of the
Veterinary Infectious Disease Organization (VIDO),
University of Saskatchewan

We have audited the combined balance sheet of the University of Saskatchewan - Veterinary Infectious Disease Organization as at September 30, 1999 and the statements of income, expenditure and fund balance (Research Trust, Dr. Alfred Savage VIDO Research Fund, Capital Trust and Technology Development Trust) and combined statement of cash flows for the year then ended. These financial statements are the responsibility of the Organization's management. Our responsibility is to express an opinion on these financial statements based on our audit.

Except as explained in the following paragraph, we conducted our audit in accordance with auditing standards generally accepted in Canada. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management as well as evaluating the overall financial statement presentation.

The Organization derives part of its income in the form of donations and certain grants the completeness of which is not susceptible to satisfactory audit verification. Accordingly, our verification of revenues from these sources was limited to the amounts recorded in the records of the Organization and we were not able to determine whether any adjustments might be necessary to donations and grant revenue, excess of income over expenditure, assets and fund balance.

In our opinion, except for the effect of adjustments, if any, which we might have determined to be necessary had we been able to satisfy ourselves concerning the completeness of donations and certain grants referred to in the preceding paragraph, these financial statements present fairly, in all material respects, the financial position of the Organization as at September 30, 1999 and the results of its operations and the changes in its financial position for the year then ended in accordance with accounting principles generally accepted in Canada.

Saskatoon, Canada
March 16, 2000

Ernst & Young LLP
Chartered Accountants

ERNST & YOUNG

UNIVERSITY OF SASKATCHEWAN
VETERINARY INFECTIOUS DISEASE ORGANIZATION (VIDO)

RESEARCH TRUST - STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE
YEAR ENDED SEPTEMBER 30, 1999
(1998 figures restated - See Note 12)

	1999	1998
INCOME		
Donations and unconditional grants (Schedule 1)	$ 493,337	$ 387,430
Conditional grants (Schedule 2)	2,859,507	2,379,798
Contract research		
Department of Western Economic Diversification	476,803	591,378
Commercial	740,117	744,815
Associated Company	18,965	21,922
Government of the Province of Saskatchewan		
-Saskatchewan Department of Agriculture & Food	300,000	300,000
-Department of Saskatchewan Economic and Co-operative Development	595,533	785,943
Ag-West Biotech Inc.	95,108	99,510
Department of National Defence	69,701	48,028
Contract services	-	8,596
Royalties	205,000	200,000
Investment income	117,205	25,166
Animal sales	64,653	30,983
University of Saskatchewan	157,448	158,730
	6,193,377	5,782,299
EXPENDITURE		
Salaries and benefits	3,270,068	3,036,287
Materials and supplies	1,137,296	834,290
Animal services	135,829	151,050
Equipment repair and service agreements	55,622	52,510
Sub-contract research (Note 8)	207,017	86,902
Travel and recruiting	136,935	141,413
Patents and legal fees	293,757	146,300
Amortization	232,358	226,698
Other expenditures (Note 9)	82,257	183,986
	5,551,139	4,859,436
EXCESS OF INCOME OVER EXPENDITURE	642,238	922,863
FUND BALANCE, BEGINNING OF YEAR, AS PREVIOUSLY STATED	4,889,272	3,678,190
PRIOR PERIOD ADJUSTMENT (Note 12)	(431,657)	-
	4,457,615	3,678,190
	5,099,853	4,601,053
TRANSFER TO CAPITAL TRUST	(135,151)	(143,438)
	$ 4,964,702	$ 4,457,615

See accompanying notes

UNIVERSITY OF SASKATCHEWAN
VETERINARY INFECTIOUS DISEASE ORGANIZATION (VIDO)

DR. ALFRED SAVAGE VIDO RESEARCH FUND
STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE
YEAR ENDED SEPTEMBER 30, 1999

	1999			1998		
	Restricted for Endowment Purposes	**Expendable Funds**	**TOTAL**	Restricted for Endowment Purposes	Expendable Funds	TOTAL
INCOME						
Investment earnings	**$ 749**	**$ 3,586**	**$ 4,335**	$ 996	$ 3,543	$ 4,539
EXPENDITURES						
Administration fees	-	-	-	-	148	148
Excess of income over expenditure	**749**	**3,586**	**4,335**	996	3,395	4,391
FUND BALANCE, BEGINNING OF YEAR	**59,027**	**14,692**	**73,719**	58,031	11,297	69,328
FUND BALANCE, END OF YEAR	**$ 59,776**	**$ 18,278**	**$ 78,054**	$ 59,027	$ 14,692	$ 73,719

See accompanying notes

UNIVERSITY OF SASKATCHEWAN
VETERINARY INFECTIOUS DISEASE ORGANIZATION (VIDO)

CAPITAL TRUST
STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE
YEAR ENDED SEPTEMBER 30, 1999

	1999	1998
INCOME		
Investment earnings	$ 21,652	$ 6,499
Grant from University of Saskatchewan	-	21,000
EXCESS OF INCOME OVER EXPENDITURE	21,652	27,499
FUND BALANCE, BEGINNING OF YEAR	486,952	316,015
	508,604	343,514
Purchase of Capital Assets	(64,849)	(56,562)
Transfer from Research Trust	200,000	200,000
FUND BALANCE, END OF YEAR	$ 643,755	$ 486,952

TECHNOLOGY DEVELOPMENT TRUST
STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE
YEAR ENDED SEPTEMBER 30, 1999

	1999	1998
FUND BALANCE, BEGINNING OF YEAR	$ 147,053	$ 677,920
Provision for Revaluation of Note Receivable (Note 11)	(147,053)	(530,867)
FUND BALANCE, END OF YEAR	$ -	$ 147,053

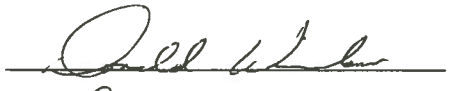
See accompanying notes

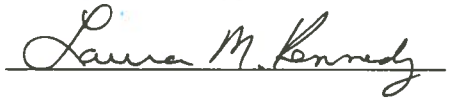
UNIVERSITY OF SASKATCHEWAN
VETERINARY INFECTIOUS DISEASE ORGANIZATION (VIDO)

COMBINED BALANCE SHEET
AS AT SEPTEMBER 30, 1999
(1998 figures restated - See Note 12)

	1999	1998
ASSETS		
CURRENT ASSETS		
Funds held - University of Saskatchewan	**$ 1,152,098**	$ 1,196,948
Due from University of Saskatchewan - operating fund	**375,603**	351,330
Accounts receivable (Note 3)	**966,288**	634,666
Inventories (Note 4)	**112,427**	102,097
	2,606,416	2,285,041
INVESTMENTS	**647,577**	574,345
NOTE RECEIVABLE (Note 5)	**-**	147,053
CAPITAL ASSETS (Note 6)	**3,284,707**	2,961,705
	$ 6,538,700	$ 5,968,144
LIABILITIES		
CURRENT LIABILITIES		
Accounts payable	**$ 6,100**	$ 6,100
Accrued Vacation Pay (Note 12)	**257,470**	208,114
Unearned revenue (Note 7)	**588,619**	588,591
	852,189	802,805
EQUITY		
RESEARCH TRUST	**$ 4,964,702**	$ 4,457,615
DR. ALFRED SAVAGE VIDO RESEARCH FUND	**78,054**	73,719
CAPITAL TRUST	**643,755**	486,952
TECHNOLOGY DEVELOPMENT TRUST	**-**	147,053
	5,686,511	5,165,339
	$ 6,538,700	$ 5,968,144

APPROVED BY THE BOARD:


Director


Trustee

See accompanying notes

UNIVERSITY OF SASKATCHEWAN
VETERINARY INFECTIOUS DISEASE ORGANIZATION (VIDO)

COMBINED STATEMENT OF CASH FLOWS
YEAR ENDED SEPTEMBER 30, 1999
(1998 figures restated - see Note 12)

	1999	1998
CASH FLOWS FROM OPERATING ACTIVITIES		
Research Trust-Excess Income over Expenditure	$ 642,238	$ 922,863
Technology Development Trust - Provision for valuation of Note Receivable	(147,053)	(530,867)
Dr. Alfred Savage VIDO Research Fund-Excess Income over Expenditure	3,586	3,395
	498,771	395,391
Net change in non-cash working capital	(316,841)	(160,165)
Amortization of capital assets	232,358	226,698
Net cash flows from operating activities	414,288	461,924
CASH FLOWS FROM INVESTING ACTIVITIES		
Investment in University of Saskatchewan long-term investment pool	(73,232)	(441,314)
Decrease in note receivable	147,053	530,867
Purchase of Capital Assets	(555,360)	(138,649)
Net cash flows used in investing activities	(481,539)	(49,096)
CASH FLOWS FROM FINANCING ACTIVITIES		
Dr. Alfred Savage VIDO Research Fund-Excess Income over Expenditure	749	996
Capital Trust - Grant from University of Saskatchewan	-	21,000
Capital Trust-Investment income related to capital purchase	21,652	6,499
Net cash flows from financing activities	22,401	28,495
NET (DECREASE) INCREASE IN CASH	(44,850)	441,323
CASH, BEGINNING OF YEAR	1,196,948	755,625
CASH, END OF YEAR	$ 1,152,098	$ 1,196,948
CASH CONSISTS OF:		
Funds held - University of Saskatchewan	$ 1,152,098	$ 1,196,948

See accompanying notes

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SEPTEMBER 30, 1999

1. ESTABLISHING AGREEMENT

The Organization (VIDO) was established by an Agreement dated August 11, 1975 between the Devonian Foundation of Calgary, Alberta, the Province of Alberta, the Province of Saskatchewan and the University of Saskatchewan to conduct research on infectious diseases of food producing animals.

Effective April 1, 1980 the above Agreement was replaced by a Constitution which provides for a Board of Directors to assume the responsibilities formerly performed by the Board of Advisors and the Governing Committee.

2. SIGNIFICANT ACCOUNTING POLICIES

These financial statements have been prepared in accordance with generally accepted accounting principles which include the following policies:

Fund Accounting

The Organization (VIDO) follows the deferral method of accounting for contributions and grants to each of its funds. The Organization (VIDO) classifies its funds by purpose and objective as follows:

The Research Trust fund consists of revenue and expenditures related to the Organization's (VIDO's) program delivery and administrative activities. This may also include the purchase of assets through grants that are specific to the Research Trust.

The Capital Trust fund consists of grants, investment earnings and authorized transfers from the Research Trust fund and Dr. Alfred Savage VIDO Research Fund to be used for the purpose of acquiring capital assets approved by the Board of Directors.

The Dr. Alfred Savage VIDO Research fund was approved as an endowment for the Organization (VIDO) until 2010. During the endowment period, 80% of the fund's annual investment earnings are available to purchase equipment, instruments, materials and supplies to be used in research projects.

The Technology Development Trust fund consists of net income generated from Technology Access Agreements and the proceeds will be used for future development of technology under patent or license.

Inventories

Inventories of materials and supplies are valued at the lower of cost and net realizable value. Animal inventory is valued at cost.

Investments

Funds designated as endowment funds, restricted for the purposes of acquiring capital assets or future expenditures are invested with other funds from the University of Saskatchewan in a long-term investment pool. Long-term investments are carried at market value.

Revenue Recognition

Restricted contributions are recognized as revenue of the Research Trust fund in the year in which the related expenditures are incurred. Unrestricted contributions are recognized as revenue of the Research Trust fund when received.

Investment income earned on the Dr. Alfred Savage VIDO Research fund is recognized as income of that fund; 20% of the fund's earnings are retained for reinvestment. Investment income earned on the Research Trust fund and Capital Trust fund is recognized as revenue when earned.

Capital Assets

Purchased capital assets are recorded at cost. Amortization is provided on a straight-line basis over the asset's estimated life as follows:

Computers	3 years
Software	3 years
Vehicles	6 years
Furnishings and equipment	8 years
Site improvements	20 years
Buildings	40 years

Royalties

Royalties are recognized as they are received or earned.

3. ACCOUNTS RECEIVABLE

	1999	1998
Conditional grants (Schedule 2)	$ 199,382	$ 87,931
Contract research	665,815	442,725
Contract services	-	3,412
Royalties	100,000	100,000
Accrued interest	1,091	598
	$ 966,288	$ 634,666

4. INVENTORIES

	1999	1998
Animals	$ 59,756	$ 49,320
Materials and supplies	52,671	52,777
	$ 112,427	$ 102,097

5. NOTE RECEIVABLE

As of December 15, 1993, the University of Saskatchewan, as represented by the Organization (VIDO), signed a Debenture/Debt Transfer Agreement with 598707 Saskatchewan Ltd., the trustee of the BIOSTAR Trust. This agreement transfers the debt obligation including related interest as evidenced by the Debenture made between BIOSTAR Inc. and the University of Saskatchewan, effective December 11, 1991, to 598707 Saskatchewan Ltd. Consideration for the transfer was a Promissory Note of $4,699,876 bearing no interest and due on demand. The only asset of the BIOSTAR Trust is shares in BIOSTAR Inc. The book value of those shares based on the audited financial statement of BIOSTAR Inc., is $0.00 at March 31, 1999 (1998-$147,053).

	1999	1998
Note Receivable	$ 4,699,876	$ 4,699,876
less: Allowance for Revaluation of Note Receivable	4,699,876	4,552,823
	$ -	$ 147,053

6. CAPITAL ASSETS

	1999			1998
	Cost	Accumulated Amortization	Net Book Value	Net Book Value
Computers	$ 599,166	$ 556,032	$ 43,134	$ 39,292
Software	28,380	20,917	7,463	-
Vehicles	133,305	67,147	66,158	2,657
Furnishings & Equipment	2,254,507	1,631,317	623,190	246,503
Site Improvements	158,512	141,844	16,668	17,918
Buildings	5,089,649	2,561,555	2,528,094	2,655,335
	$ 8,263,519	$ 4,978,812	$ 3,284,707	$ 2,961,705

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7. UNEARNED REVENUE

	1999	1998
Conditional grants (Schedule 2)	**$ 583,237**	$ 588,101
Contract research	**5,382**	490
	$ 588,619	$ 588,591

8. SUB-CONTRACT RESEARCH

During the year the Organization (VIDO) entered into sub-contract research collaborations with various third parties relating to funding from conditional grants and contracts including the following:

	Total Contract	**Sub-Contract Research 1999**	Sub-Contract Research 1998
Natural Sciences & Engineering Research Council of Canada	$ 89,600	**$ -**	$ 28,200
Beef Industry Development Fund	217,440	**53,403**	26,702
Vetrepharm Canada Inc.	125,000	**-**	32,000
Agri-Food Innovation Fund	862,000	**153,614**	-
		$ 207,017	$ 86,902

9. OTHER EXPENDITURES

Other expenditures consist of the Organization (VIDO) operating accounts which include repairs and maintenance, equipment rental, annual report and technical bulletins, professional fees and Board expenses.

10. INCOME TAXES

The Organization (VIDO) is not subject to either federal or provincial income taxes. The Organization (VIDO) is required to pay GST and PST on taxable services and supplies.

11. RELATED PARTY TRANSACTIONS

a) The Organization (VIDO) is a research affiliate of the University of Saskatchewan. The University of Saskatchewan maintains, as part of its normal operations, various financial and administrative functions relating to the Organization (VIDO). The financial statements do not include expenditures for administrative and ancillary services, or in-kind support provided by the University of Saskatchewan.

b) The University of Saskatchewan is the beneficiary of a Trust which owns 16.85% of BIOSTAR Inc. as at March 31, 1999 (1998-27.54%). BIOSTAR Inc. is a research and development company associated with the development of some of the Organization's (VIDO's) products and technologies. During the year the Organization (VIDO) had the following transactions with BIOSTAR Inc.:

	1999	1998
Income from BIOSTAR Inc. to VIDO		
Contract research	**$ 18,965**	$ 21,922
Contract services and leases	**-**	8,596
Royalties	**200,000**	200,000

At September 30, 1999 the Organization (VIDO) has a receivable from BIOSTAR Inc. of $106,570 (1998 -$108,659).

c) In 1993, the Organization (VIDO) entered into technology access agreements relating to specific products with BIOSTAR Inc. Income of $4,699,876 generated from these agreements is in the Technology Development Trust fund. Consideration for this transaction was a Note Receivable (Note 5). During the current year, the allowance was increased by $147,053 to $4,699,876 to recognize a potential decline in value of this receivable.

12. RESTATED FINANCIAL STATEMENTS

The Organization (VIDO) has changed their accounting regarding the accrual of vacation pay for employees and now recognizes the expenditure in the year it occurs.

During 1998, certain activity was transferred between the year-end fund balances of the Research Trust. In 1999, prior period adjustments reflect the change from the practice of including the clearing account fund balance as a receivable from the University of Saskatchewan.

Certain prior year comparative figures have been changed to conform to the current year's presentation. The effect of these changes reflected retroactively to the financial statements is as follows:

	1998
Research Trust fund balance, beginning of year, as previously reported	$ 4,109,847
Restatements:	
a) Change in fund balance reflecting vacation pay accrual	(208,114)
b) Change in fund balance to correct recording of prior period fund transfers	(106,837)
c) Change in fund balance to correct recording of prior period accruals	(116,706)
	$ 3,678,190

13. CONTINGENCIES

The Organization (VIDO) has entered into certain contractual arrangements, which may require repayment of the contracted amount if the research sponsored by the contract results in commercialization. There are no amounts repayable under these contracts at September 30, 1999.

14. THE YEAR 2000 ISSUE

The Year 2000 Issue arises because many computerized systems use two digits rather than four to identify a year. Date-sensitive systems may recognize the year 2000 as 1900 or some other date, resulting in errors when information using year 2000 dates is processed. In addition, similar problems may arise in some systems which use certain dates in 1999 to represent something other than a date. Although the change in date to the year 2000 has occurred, it is not possible to conclude that all aspects of the Year 2000 Issue that may affect the entity, including those related to customers, suppliers, or other third parties, have been fully resolved.

UNIVERSITY OF SASKATCHEWAN
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SCHEDULE OF DONATIONS AND UNCONDITIONAL GRANTS

YEAR ENDED SEPTEMBER 30, 1999

	1999	1998
LIVESTOCK INDUSTRY		
Beef		
Saskatchewan Horned Cattle Trust Fund	$ 75,000	$ 35,000
Kamloops Stockmen's Association	700	-
Saskatchewan Cattle Marketing Deductions Fund	150,000	85,000
Manitoba Cattle Producers Association	5,000	-
	230,700	120,000
Dairy		
Alberta Milk Producers	25,000	-
Dairy Farmers of Ontario	50,000	25,000
South Coastal Dairy Education Association	500	-
	75,500	25,000
Swine		
Ontario Pork Producers' Marketing Board	-	55,000
Alberta Pork Producers Development Corporation	50,000	50,000
BC Hog Marketing Commission	-	-
Manitoba Pork Council	30,000	20,000
Sask Pork	-	40,000
Swine Improvement Services Cooperative	242	190
	80,242	165,190
Poultry		
Alberta Chicken Producers	-	15,840
Canadian Turkey Marketing Agency	50,000	25,000
	50,000	40,840
PROVINCIAL GOVERNMENTS		
Alberta	40,000	20,000
British Columbia	1,200	700
Manitoba	15,200	15,200
	56,400	35,900
OTHER FOUNDATIONS, COMPANIES AND INDIVIDUALS		
Individuals	495	500
	$ 493,337	$ 387,430

See accompanying notes

UNIVERSITY OF SASKATCHEWAN

VETERINARY INFECTIOUS DISEASE ORGANIZATION (VIDO)

SCHEDULE OF CONDITIONAL GRANTS AND CONTRACTS

YEAR ENDED SEPTEMBER 30, 1999

	September 30, 1998		1999	September 30, 1999			
	Accounts Receivable	Unearned Revenue	Funds Received	Accounts Receivable	Unearned Revenue	**1999 Income**	1998 Income
Natural Sciences & Engineering							
Research Council of Canada (NSERC) -Operating, Strategic and Equipment	$ -	$ 128,913	$ 462,465	$ -	$ 180,111	**$ 411,267**	$ 556,696
-Industry Matching	-	-	-	-	-	**-**	13,362
BIOSTAR Inc. - NSERC Industrial Research	-	-	-	-	-	**-**	13,717
Canadian Bacterial Diseases Network (CBDN)	-	35,951	188,593	15,684	-	**240,228**	158,826
Agriculture Canada/NSERC Research Partnership Grants	-	79,609	144,100	-	75,814	**147,895**	66,927
Medical Research Council	-	44,365	164,423	-	88,712	**120,076**	346,699
World Health Organization	-	232	30,968	-	31,200	**-**	22,946
Ontario Cattlemen's Association	-	23,001	12,800	30,928	-	**66,729**	16,999
Alberta Agriculture Research Institute (AARI) -Matching Grants Program	44,255	78,572	231,086	10,004	23,685	**251,722**	310,185
Human Frontier Science Program	-	16,164	88,343	-	-	**104,507**	64,546
Alberta Cattle Commission	-	-	-	-	-	**-**	57,331
Saskatchewan Agriculture Development Fund	-	12,365	167,200	91,764	-	**271,329**	273,502
Saskatchewan Beef Development Board	42,806	-	88,000	-	13,479	**31,715**	108,726
Canada-Alberta Beef Industry Development Fund	-	38,864	155,430	-	46,757	**147,537**	29,101
Beef Industry Development Fund	-	71,375	193,174	50,490	-	**315,039**	228,880
Beef Cattle Industry Development Fund	870	-	60,906	512	43,469	**17,079**	11,351
Agri-food Innovation Fund	-	58,690	580,000	-	25,771	**612,919**	31,310
Health Services Utilization and Research Commission	-	-	30,017	-	27,797	**2,220**	7,056
Saskatchewan Health Research Board Fellowship	-	-	63,187	-	-	**63,187**	61,638
Dairy Farmers of Canada	-	-	40,000	-	22,498	**17,502**	-
British Columbia Investment Agriculture Foundation	-	-	42,500	-	3,944	**38,556**	-
	$ 87,931	$ 588,101	$ 2,743,192	$ 199,382	$ 583,237	**$ 2,859,507**	$ 2,379,798

Patents Issued on Which VIDO Staff are Inventors

Germany Patent No. P 692 28 944.5-08
Title: Recombinant bovine herpesvirus type 1 polypeptides and vaccines
Date: September 27, 1999
Inventors: Babiuk, L.A., van den Hurk, S., Zamb, T. and Fitzpatrick, D.

United States Patent No. 5,951,988
Title: Adjuvant formulation with enhanced immunogenic activity and related compositions and methods
Date: September 14, 1999
Inventors: van Drunen Little-van den Hurk, S., Zamb, T., Redmond, M.

South Africa Patent No. 98/11410
Title: Postweaning multisystemic wasting syndrome virus from pigs.
Date: August 31, 1999
Inventors: Wang, L., Potter, A.A., Babiuk, L.A. and Willson, P.

New Zealand Patent No. 308991
Title: CAMP factor of *Streptococcus uberis*.
Date: August 12, 1999.
Inventors: Potter, A.A., Jiang, M

United States Patent No. 5,891,677
Title: *Actinobacillus pleuropneumoniae* outer membrane lipoprotein A and uses thereof.
Date: April 6, 1999
Inventors: Gerlach, G.F., Willson, P.J., Rossi-Campos, A. and Potter, A.A.

United States Patent No. 5,879,895
Title: Recombinant bovine herpesvirus type 1 polypeptides and immunoassays.
Date: March 9, 1999
Inventors: Babiuk, L., van den Hurk, S., Zamb, T. and Fitzpatrick, D.

United States Patent No. 5,876,725
Title: *Actinobacillus pleuropneumoniae* transferring-binding protein vaccines and uses thereof.
Date: March 2, 1999
Inventors: Potter, A. A., Gerlach, G. F, Willson, P. J., Rossi-Campos, A.

United States Patent No. 5,871,750
Title: Leukotoxin vaccine compositions and uses thereof.
Date: February 16, 1999.
Inventors: Potter, A.A.

United States Patent No. 5,863,543
Title: CAMP factor of *Streptococcus uberis*
Date: January 26, 1999
Inventors: Potter, A.A., Jiang, M. and MacLachlan, P.R.

United States Patent No. 5,858,989
Title: Vaccines comprising nucleotide sequences encoding bovine herpesvirus type 1, GI, GIII and GIV.
Date: January 12, 1999
Inventors: Babiuk, L.A., van den Hurk, S., Zamb, T. and Fitzpatrick D.

European Patent No. EP 0 635 055 B1
Title: *Haemophilus somnus* immunogenic proteins
Date: December 23, 1998.
Inventors: Potter, A.A., Pontarollo, R.A., Pfeiffer, C.G., Theisen, M. Harland, R.J. and Rioux, C.

United States Patent No. 5,849,531
Title: Compositions and treatments for pneumonia in animals.
Date: December 15, 1998
Inventors: Potter, A.A.

United States Patent No. 5,837,268
Title: GnRH-leukotoxin chimeras.
Date: November 17, 1998
Inventors: Potter, A.A. and Manns, J.G.

Netherlands Patent No. 0 659 086 B1
Title: Novel bacterial vaccines using vaccine strains of pathogenic bacteria.
Date: November 11, 1998.
Inventors: Allan, B. and Potter, A.A.

United States Patent No. 5,820,868
Title: Recombinant protein production in bovine adenovirus expression vector system.
Date: October 13, 1998
Inventors: Mittal, S.K., Graham, F.L., Prevec, L. and Babiuk, L.A.

Research Publications in Scientific Journals

Baca-Estrada M.E., Foldvari M., and Snider M. 1999. Induction of mucosal immune responses by administration of liposomal-antigen formulations and IL-12. J. Interferon and Cytokine Res. 19:455-462.

Baxi M. K., Babiuk L.A., Mehtali M. and Tikoo S.K. 1999. Transcription map and expression of bovine herpesvirus-1 glycoprotein D in early region 4 of bovine adenovirus type 3. Virology 261:143-152.

Braun R.P., Babiuk, L.A. and van Drunen Littel-van den Hurk S. 1998. Compatibility of plasmids expressing different antigens in a single DNA vaccine formulation. J. Gen. Virol. 79: 2965-2970.

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Gomis S.M., Godson D.L., Wobeser G.A., and Potter A.A. 1998. Intracellular survival of *Haemophilus somnus* in bovine blood monocytes and alveolar macrophages. Microbial Pathogenesis 25:227-235.

Griebel P.J., Beskorwayne T., van den Broeke A., and Ferrari G. 1999. CD40 signaling induces B cell responsiveness to multiple members of the chain-common cytokine family. Intl. Immunology 11: 1139-1148

Hanon E., Keil G., van Drunen Littel-van den Hurk S., Griebel P.J., Vanderplaschen A., Babiuk L.A. and Pastoret P.-P. 1999. BHV-1 induced apoptotic cell death: role of glycoprotein D. Virology 257: 191-197.

Harding J., Clark E., Strokape J., Willson P.J., and Ellis J. 1998. Post-weaning multi-systemic wasting syndrome: Epidemiology and clinical presentation. Swine Health and Production 6:249-254.

Hegde N.R., Deshpande M.S., Godson D.L., Babiuk L.A. and Srikumaran S. 1999. Bovine lymphocyte antigen-A11—specific peptide motif as a means to identify cytotoxic T-lymphocyte epitopes of bovine herpesvirus 1. Viral Immunol 12: 149-61.

Huang H.S., Potter A.A., Campos M., Leighton F.A., Willson P.J., Haines D.M., and Yates W.D. 1999. Pathogenesis of porcine *Actinobacillus pleuropneumonia*, Part II: Roles of pro-inflammatory cytokines. Can J. Vet Res. 63:69-78.

Huang H.S., Potter A.A., Campus M., Leighton F.A., Willson P., Haines D. and Yates W.D.G. 1999. The study of the pathogenesis of porcine *Actinobacillus pleuropneumonia*: Part II. Roles of pro-inflammatory cytokines. Canadian Journal of Veterinary Research (in press).

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Jiang M., MacLachlan P.R., Babiuk L.A., Bolton A. and Potter A.A. 1998. The abp locus of *Streptococcus uberis* encoding a protein homologous to polar amino acid and opine binding proteins of gram-negative bacteria. Canadian Journal of Microbiology 44:784-788.

Mittal S.K., Tikoo S.K., van Donkersgoed J., Beskorwayne T., Godson D.L. and Babiuk L.A., 1999. Experimental inoculation of heifers with bovine adenovirus-3. Can. J. Vet. Res. 63:153-156.

Morsey M.A., Van-Kesse A.G., Mori Y., Popowych Y., Godson D.L., Campos M. and Babiuk L.A. 1999. Cytokine profiles following interaction between bovine alveolar macrophages and *Pasteurella haemolytica*. Microb Pathog 26: 325-31.

Mutwiri G., Watts T., Lew L., Beskorwayne T., Papp Zs., Baca-Estrada M.E. and Griebel P. 1999. Ileal and jejunal Peyer's patches play distinct roles in mucosal immunity of sheep. Immunology 97:455-461.

Papp Zs., Babiuk L.A. and Baca-Estrada M.E. 1999. Antigen-specific cytokine and antibody isotype profiles induced by mucosal and systemic immunizations with recombinant adenovirus. Viral Immunol. 12:107-116.

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van den Broeke A., Bagnis C., Ciesiolka M, Cleuter Y., Gelderblom H., Kerkhofs P., Griebel P., Mannoni P., and Burny, A. 1999. *In vivo* rescue of a tax-deficient Bovine Leukemia Virus from ovine B cell tumours by recombination with a wild-type retrovirally-transduced tax gene. J. Virol. 73: 1054-1065.

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Wright P.W., Braun R., Babiuk L.A., van Drunen Littel-van den Hurk S., Moyana T., Zheng C., Chen Y. and Xiang J. 1999. Adenovirus-mediated TNF-• gene transfer induces significant tumor regression in mice. Cancer Biotherapy and Radiopharmaceuticals 14: 49-57.

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Zakhartchouk A.N., Pyne C., Mutwiri G., Papp Z., Baca-Estrada M.E., Griebel P, Babiuk L.A. and Tikoo S.K. 1999. Recombinant bovine adenovirus for the induction of mucosal and systemic immune responses in calves. J. Gen. Virol. 80:1263-1269.

Research Presentations, Posters, and Abstracts Presented at Meetings

Baca-Estrada M.E., Snider M., Papp Zs., Babiuk L.A. Immune responses in the nasopharyngeal and palatine tonsils of sheep following intranasal immunization. 10th International Congress of Mucosal Immunology. Amsterdam, The Netherlands. June 27-July 1, 1999.

Baxi M.K., Babiuk L.A., Mehtali M., and Tikoo S.K., 1999. Characterization of E4 region of bovine adenovirus-3. XI International Congress of Virology. Sydney, Australia Aug. 9-13, 1999.

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Bolton A., Habermehl M., Willson P.J and Potter A.A.. 1999. Streptococcal vaccines for the prevention of bovine mastitis. CBDN Annual Meeting. Banff, AB. May 1999.

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Research Collaborators

Dr. C. Bagnis – Gene Therapy Laboratory, Marseille, France
Dr. J. Berg – Lakeside Research, Brooks, AB
Dr. T. Besser – University of Washington, Seattle, WA
Dr. T. Beveridge – University of Guelph, Guelph, ON
Dr. T.L. Bowersock, Phamacia & UpJohn Animal Health, Kalamazoo, MI
Prof. A. Burny - Universite Libre, Brussels, Belgium
Dr. P. Dubeski - Agriculture and Agri-Food Canada, Lacombe, AB
Dr. B. Duncan – CFIA, Nepean, ON
Dr. B. Finlay – University of British Columbia, Vancouver, BC
Dr. D. Hancock – University of Washington, Seattle, WA
Dr. J. Harding - Harding Veterinary Services, Humboldt, SK
Dr. P. Heegaard - Danish Veterinary Laboratory, Copenhagen, Denmark
Dr. A. Hodgson – CSIRO, Australia
Dr. V. Kapur – University of Minnesota, St. Paul, MN
Dr. W.W. Kay – University of Victoria, Victoria, BC
Dr. B. Koumikakis – DRES, Medicine Hat, AB
Dr. R. Lo – University of Guelph, Guelph, ON
Dr. C. Lutz-Wallace – CFIA, Nepean, ON
Dr. M. Mehtali – Transgene, France
Dr. S. Nibbelink – Bayer AG Animal Health, Leverkusen, Germany
Prof. C-A. Reynaud - Institut Necker, Paris, France
Dr. C. Rinehart – BIVI, St. Joseph, MO
Dr. T. Schryvers – University of Calgary, Calgary, AB
Dr. B. Stillborn – Lakeside Research, Brooks, AB
Dr. A. van den Broeke - Universite Libre, Brussels, Belgium
Dr. J. van Donkersgoed – Lacombe, AB
Prof. J-C. Weill – Institut Necker, Paris, France
Dr. C. Whitfield – University of Guelph, Guelph, ON

University of Saskatchewan

Dr. M. Chirino-Trejo – Vet. Microbiology, WCVM
Dr. E.G. Clark - Veterinary Pathology, WCVM
Dr. J.A. Dosman - Centre for Agricultural Medicine, RUH
Dr. J. Ellis - Veterinary Microbiology, WCVM
Dr. M. Foldvari - College of Pharmacy and Nutrition
Dr. J. Gordon - Vet. Microbiology, WCVM
Dr. D. Middleton - Veterinary Pathology, WCVM
Dr. R. Miller - Dept. of Mechanical Engineering
Dr. A. Senthilselvan - Centre for Agricultural Medicine, RUH
Dr. H. Townsend - Veterinary Internal Medicine, WCVM

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have been and will continue to be the primary targets
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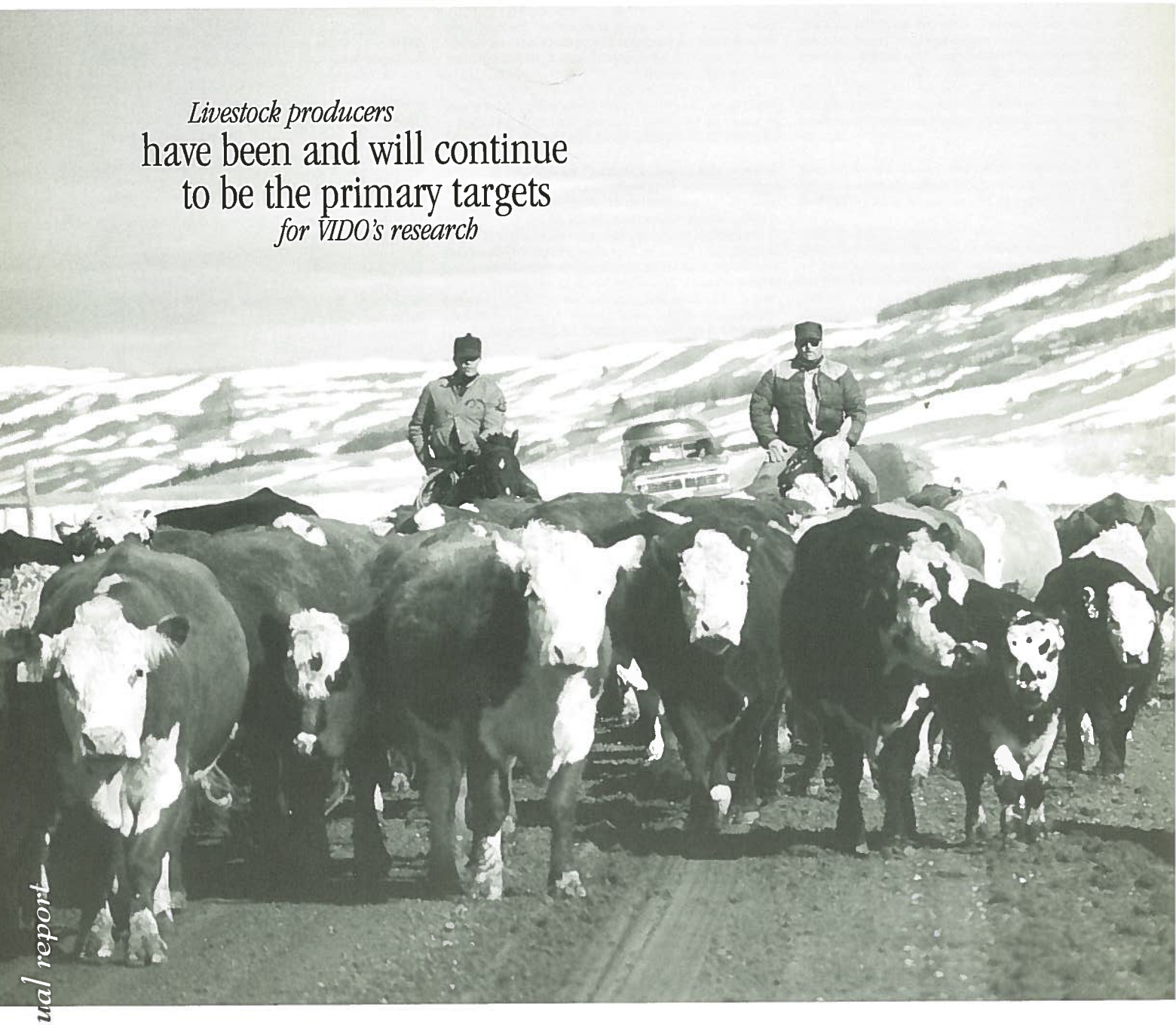

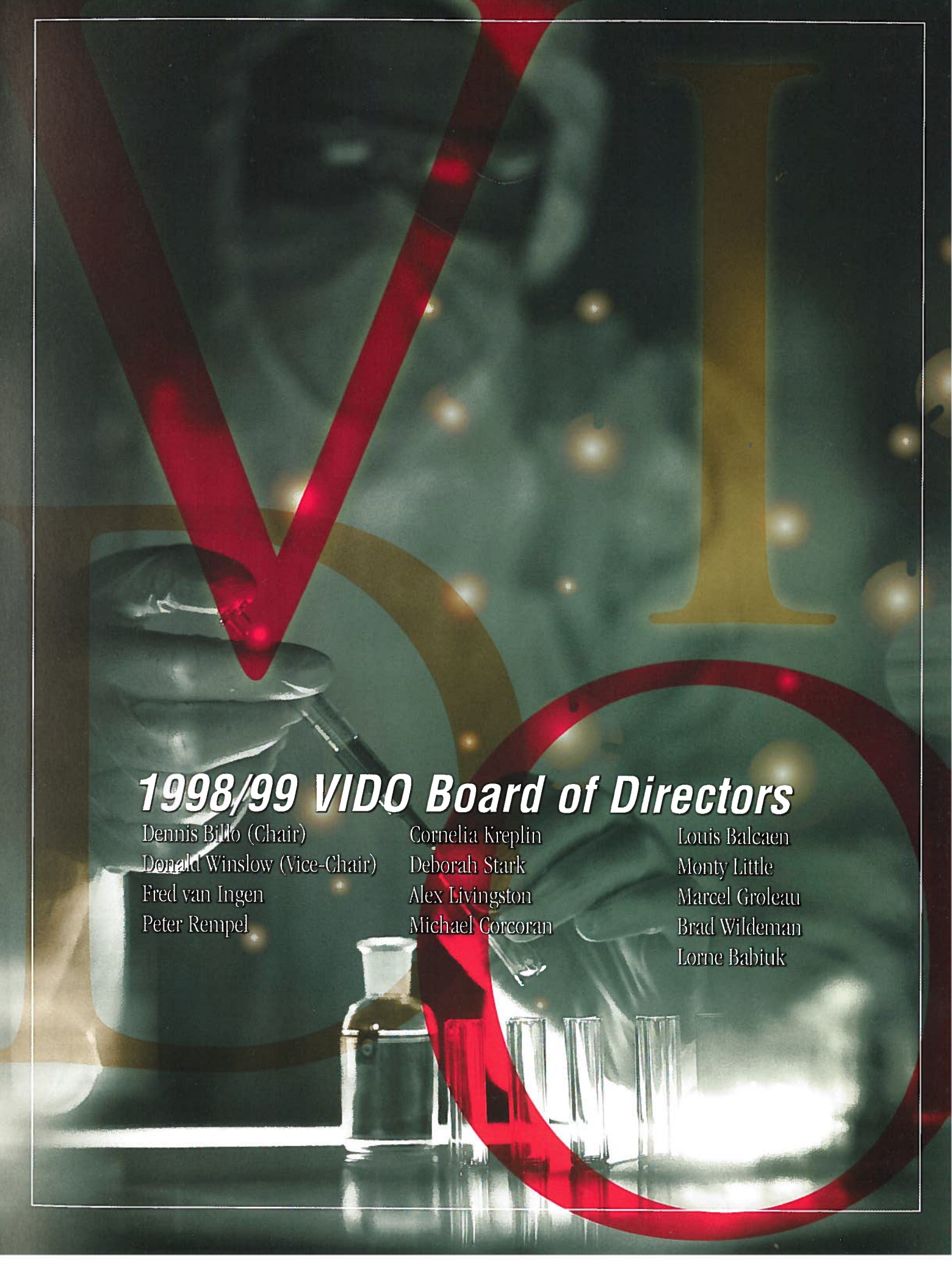

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VIDO

University of Saskatchewan
120 Veterinary Road
Saskatoon SK S7E 5E3
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