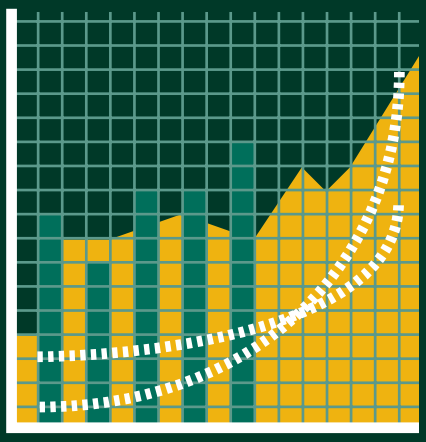


University of Alberta:

Its Economic Impact, 2000

University of Alberta: Its Economic Impact

University of Alberta: Its Economic Impact

Opened in 1908, the University of Alberta has grown to become one of Canada's five largest research-intensive universities, with external research funding in 1999-2000 of almost $214 million. The University is situated in Edmonton, the vibrant, cosmopolitan capital of the province of Alberta. The metro Edmonton region has a population in excess of 900,000.

The University of Alberta serves more than 30,000 graduate and undergraduate students and employs 9,500 people. Students enjoy an exceptional quality of life on a friendly campus in the midst of a city that values research and technology as well as its beautiful river-valley parkland.

University of Alberta: Its Economic Impact, 2000

The research, teaching, and public service undertaken by the people who make up the University of Alberta directly benefits the economies of Edmonton, the Capital Region, Alberta, Canada, and beyond. The following information, collected in May 2000, uses data from 1998-99, 1999-2000, and projections for 2000-01, whichever is most currently available.

Budget, 2000-2001

The University of Alberta's budget for 2000-01 projects revenues of $865.2 million, made up of the following components (in millions of dollars):

Source	*Amount ($ millions)*	*% of total*
• Alberta Government Base Funding	$238.0	27.5%
• Alberta Access/Conditional Funding	21.9	2.5%
• Tuition and fees	93.2	10.8%
• Sponsored research funding*	223.7	25.8%
• Investment and Endowment Earnings (non-research), Transfers and appropriations	23.1	2.7%
• Departmental Earnings (fees, investment income)	44.2	5.1%
• Special Purpose Funding (government; other sponsors; non-research endowment allocations)	60.3	7.0%
• Ancillary Operations	54.3	6.3%
• Capital Programs and Projects	106.5	12.3%
Total:	**$865.2**	**100.0%**

* Including approximately $12 million **each** for clinical trials and research through TRIUMF at the University of British Columbia.

Almost 90 per cent of this amount ($770 million) is spent locally.

Job Creation

The University of Alberta is a major employer and source of job creation in the Province of Alberta:

- In 1998-99, the University of Alberta employed more than *9,545 individuals full-time and part-time.*
- The University's employees and their spending are responsible for the creation of an *additional 18,100 jobs*, mainly in the metro Edmonton region, assuming a similar mix of full- and part-time positions as exists within the University.

One in every 38 jobs in the Province of Alberta exists because of the University of Alberta.

- In 1998-99 the University of Alberta spent nearly $245 million on goods and services, from utilities to computer supplies to maintenance services. Of this amount, an estimated $185 million was spent within Alberta. This level of expenditure is estimated to be responsible for the existence of an *additional 10,400 full-time and part-time jobs.*
- Students spend money, in addition to their tuition, books, and accommodation costs. Using the living allowance of the Alberta Student Finance Board as a guide, in 1998-99 the more than 12,100 full-time students at this University from outside greater Edmonton (including 4,400 from outside the Province) spent more than $67 million. This spending alone generated work *for about 3,750 full- and part-time jobs.*
- Even without including the living expenditures (and consequent job creation impact) of the remaining 18,200 Winter Session students (not to mention spring and summer session students) many of whom might not have stayed in Alberta were it not for this University, *an estimated 42,000 jobs are the result of the existence of the University of Alberta: one in every 38 jobs in this Province.*

Payroll

The University of Alberta paid its employees *$365 million in salaries and benefits* in 1998-99, including those remunerated from external funds for research, most of which was expended in the metro Edmonton region.

Governments Collect on University Payrolls

- University of Alberta employees paid $54.2 million in federal income taxes in 1999.
- University of Alberta employees paid $25.7 million in provincial income taxes in 1999.

Sharing the Wealth – The Ripple Effect

- The University of Alberta attracted an estimated $100 million from *outside of Alberta* in 1998-99 for research and special projects, not including money that students brought in for scholarships or fellowships, or for Canada Student Loans.
- *When recycled into the economy, those dollars created an additional impact of at least $130 million.*

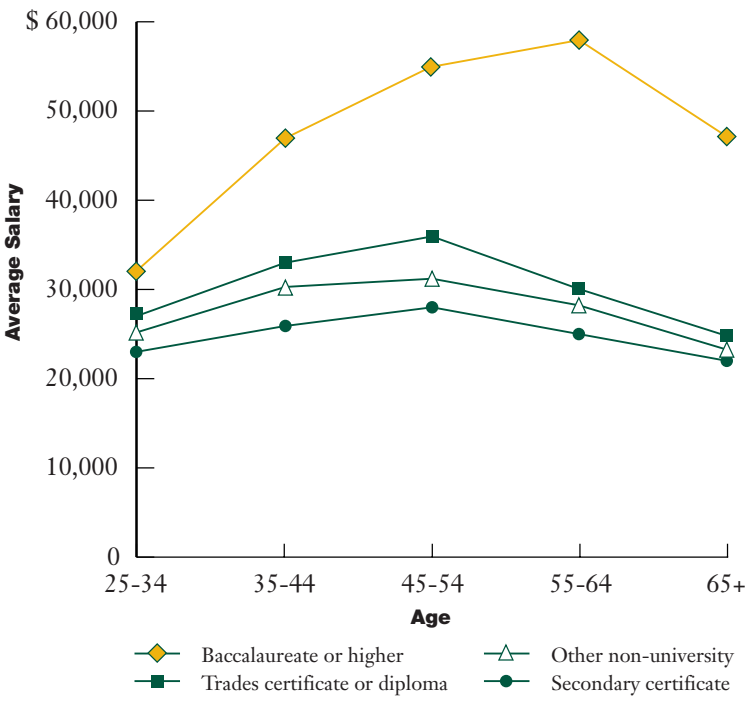
In 1998-99, the University of Alberta employed more than 9,545 individuals full-time and part-time.

University Graduates: Higher Salaries, Lower Unemployment

People with university degrees have higher average salaries and lower unemployment than those without degrees. In 1999, the University of Alberta conferred degrees on 6,346 undergraduate and graduate students. The charts on this page show just how much difference each university degree can make.

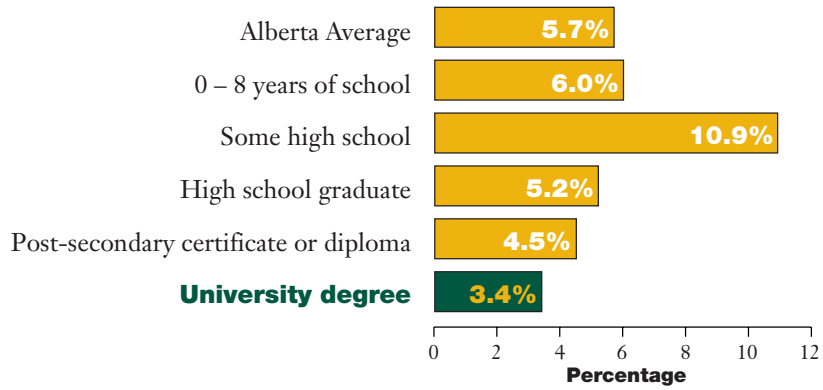
Income for Age by Educational Level, Alberta

Statistics Canada, 1996.



Alberta Unemployment Rate by Educational Attainment 1999

Source: Labour Force Survey, Statistics Canada, 1999.



Average Salaries by Educational Attainment Canada & Alberta 1996

Source: Statistics Canada.

	Average Salary	
	Canada	Alberta
Less than Grade 9	$19,377	$18,243
High School Diploma/Certificate	22,846	22,446
Post-Secondary Certificate/Diploma	25,838	25,913
University Degree	42,054	42,087

Research at the University of Alberta

In 1999-2000, the University of Alberta received almost $214 million from external sources for research, including approximately $23 million for clinical trials and research at TRIUMF. This figure places the University of Alberta in the top five universities in Canada in sponsored research funding. Much of this money is raised through highly competitive grant processes.

In 1998-99, some 3,250 University of Alberta employees alone were paid from sponsored research:

- Almost 1,220 were full-time jobs
- 2,027 were part-time staff, of whom more than 1,700 were students, who thereby combine the benefits of learning with an income
- Salaries and benefits from sponsored research funding exceeded $82.1 million

Grad student in the lab

Technology Transfer

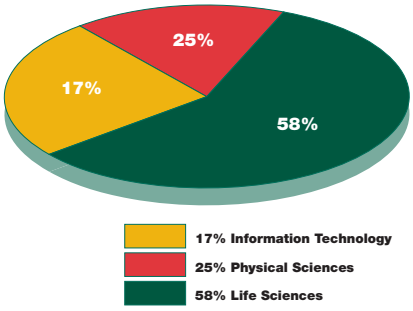
Technology transfer is an important outcome of University of Alberta research activity. In 1999-2000, licensing revenues at the University of Alberta were $1.6 million. As well, in 1999-2000:

- University of Alberta researchers disclosed 64 new inventions
- 203 licenses, options or agreements were signed
- 69 patent applications were filed or continued worldwide
- 15 patents were issued (all countries)
- 864 research agreements were executed
- 3 new spin-off companies were formed

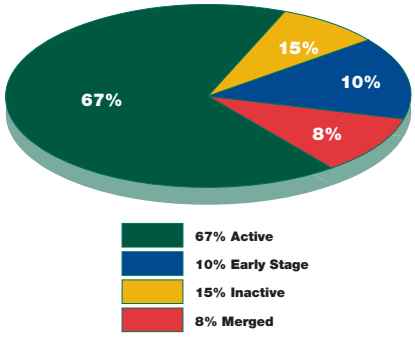
Spin-off Companies Make a Difference

As of March 31, 2000, 48 spin-off companies have been created (the earliest in 1963) as a result of University of Alberta research discoveries; they collectively employ more than 1,500 people. Thirty-eight of them are currently active; they are 100 per cent Canadian based (95% in Alberta), a testament to the University's ability to develop innovations and contribute to local and regional economic development. At the end of the 1999-2000 fiscal year, the University held equity in 22 spin-off companies with an estimated value of $7.4 million. Five spin-off companies are now publicly traded with market capitalization of *more than $1.1 billion*.

Spin-Off Companies, Distribution by Sector (March 31, 2000)

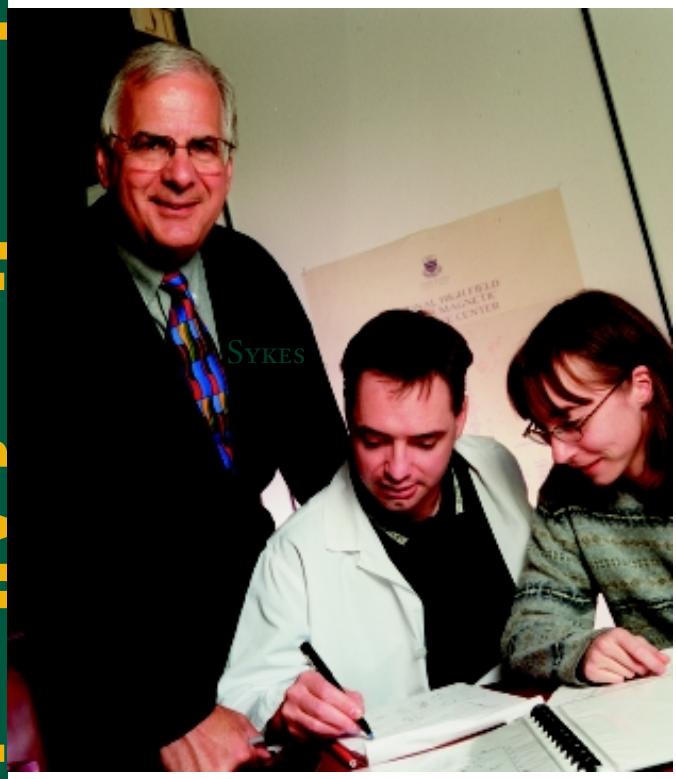


Spin-Off Companies Operational Status (March 31, 2000)



Spin-Off Company (Legal Name)	Year Founded
Raylo Chemicals Inc.	1963
Micralyne Inc. (formerly Alberta Microelectronic Corporation)	1982
Biomech Designs Ltd.	1982
C-FER Technologies Inc.	1983
Prairie Biological Research Ltd.	1984
The Laser Institute	1984
Biomira Inc.	1985
TRLabs-Telecommunications Research Laboratories	1986
NAEJA Pharmaceutical Inc. (formerly SynPhar Laboratories Inc.)	1987
Boreal Laser Inc.	1988
L&R Wang Enterprises Ltd.	1990
Ovo-Biotechnica Inc.	1991
CV Technologies Inc.	1992
Biomotion Ltd.	1994
Isotechnika Inc.	1994
Neurokinetics Inc.	1994
StatCo International Inc.	1994
SYNSORB Biotech Inc.	1994
AltaRex Corp.	1995
Indico Inc. (Edge Medical Products Inc.)	1995
PISA Inc.	1995
BioTools Inc.	1996
Orthopaedic Innovations Inc.	1996
Regional Data Management Inc. (RDM)	1996
Telephotogenics Inc.	1996
Acugene Inc./Acugenic Inc.	1997
Alberta Asthma Center	1997
CanBiocin Inc.	1997
Metabolic Modulators Research Ltd.	1997
MTI Meta Tech Inc.	1997
WavePOINT Systems Inc.	1997
AVRA Software Lab Inc.	1998
ROAM-IT (Canada) Holdings Inc.	1998
Cytovax Biotechnologies Inc.	1998
Wildlife Genetics International Inc.	1998
Altamet	1999
Dynastream	1999
AgriGenomics	1999

Discoveries That Benefit People



Dr. Brian Sykes with students

Research at the University of Alberta results in discoveries that benefit society, sometimes in surprising ways. Following are some examples of the way in which the University of Alberta is helping make a difference.


Dr. Duane Szafron


Dr. David Wishart

Interdisciplinary Research Solves Problems and Creates Economic Benefits

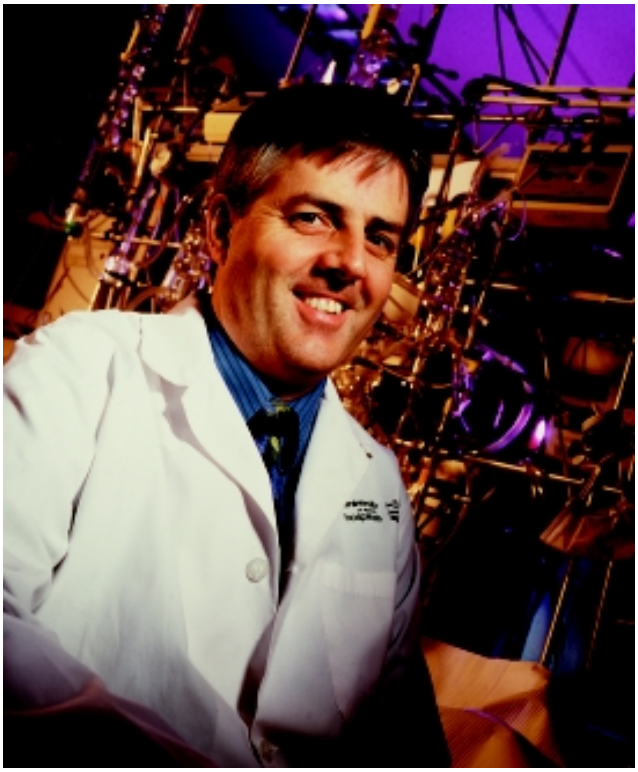
Biotools Inc. is a spin-off University of Alberta laboratory collaboration in biotechnology and information technology, which includes biochemist Dr. Brian Sykes, Dr. David Wishart in pharmacy and computing science professors Drs. Jonathan Schaeffer and Duane Szafron. It is an outstanding example of the results of interdisciplinary collaboration.

Bioinformatics, or the "application of computational power to biological problems," includes a range of expertise and products in great demand these days. Two of the company's software products, PepTool and GeneTool, allow scientists to interpret human gene sequences, providing information that will eventually help them identify the causes of various diseases and their potential treatments.

The company writes software, develops databases, and refines data-mining techniques to work with the huge masses of biological data emerging nowadays. The human genome project, in which scientists around the world are piecing together a complete map of the human genome, is an excellent example of this challenge. Once the map is drawn, however, it has to be interpreted, and the software developed by BioTools will help do that much more quickly than by more conventional means.

BioTools' success has also translated into jobs. The company now employs more than 25 people, the majority of whom hold advanced degrees. The future looks very bright indeed.

Biotools Inc. is an outstanding example of the results of interdisciplinary collaboration.



Dr. Gary Lopaschuk

The Benefits of Partnering and Leveraging

Commercializing the results of medical research always seemed like a good idea to heart researcher Dr. Gary Lopaschuk, a professor of Pediatrics, but not for himself. Gary has routinely worked with industry in research, but not until the late 1990's did he begin to think it might be possible for his group to develop compounds independently of larger pharmaceutical companies that could be used as drugs to reduce tissue damage during heart attacks.

The compounds stem from Dr. Lopaschuk's research on how heart attacks disrupt energy metabolism in the heart. His research has identified a number of enzymes that induce this unhealthy shift in metabolism. As a result, it is possible to develop drugs to target the enzymes and shift the heart back to more optimal fuel use.

Commercial interest in the research was widespread, and after examining various options, Gary set up **Metabolic Modulators Research Ltd (MMRL)**. To have a chance for success, MMRL needed extra resources and advice, as well as expertise in medicinal chemistry. Resources and advice came from the Alberta Heritage Foundation for Medical Research Technology Commercialization Program, the Industrial Research Assistance Program (IRAP) of the National Research Council, and the University of Alberta's Industry Liaison Office. The scientific expertise comes from University of Alberta chemistry professor Dr. John Vederas, who has a collaborative agreement with MMRL.

What we've done...is to create a way for us to capitalize on our lead and get more value out of the research here in Alberta.

MMRL aims to develop a novel class of drugs, known as metabolic modulators, for the clinical management of a variety of cardiovascular and metabolic diseases. "I think we have a three-year window to develop new compounds," Gary says. "It's only a matter of time before the big pharmaceutical companies duplicate our drug development process. What we've done…is to create a way for us to capitalize on our lead and get more value out of the research here in Alberta. Without MMRL, we'd be selling our technology at an early stage out of the province, and most likely out of the country."

SGI 2400

MACI: Proving the Whole is More Than the Sum of its Parts

In February 2000 the University of Alberta became home to the most powerful academic computer in Canada. The Silicon Graphics (SGI) Origin 2400 computer has 112 processors, 28 Gigabytes of memory and ranks among the world's top 500 machines measured in computational power. The SGI 2400 (actually two machines known as Aurora and Borealis) is part of the Multimedia Advanced Computational Infrastructure (MACI), a collaborative effort involving the universities of Alberta, Calgary, Lethbridge, and Manitoba. Dr. Jonathan Schaeffer, the University of Alberta professor of Computing Science who pioneered the partnership, says that no one institution could have possibly achieved what these universities have done as partners.

As a result of funding provided by the Canada Foundation for Innovation, the Alberta Intellectual Infrastructure Partnership Program, Silicon Graphics, and the universities themselves, the SGI Origin 2400 provides opportunities for research and innovation that simply could not have been undertaken in any practical way before. Among the areas of investigation, for example, are the climatic effects of El Niño; simulations of telecommunications networks; evidence-based health research; artificial intelligence; virtual reality; and biomolecular design. More than 14 University of Alberta departments in five different faculties are using the computer.

Dr. Jonathan Schaeffer

The economic impact of MACI is significant: it allows world-class research to be done in Edmonton; outstanding new faculty and graduate students will be attracted because of what they can do with MACI's resources; and others will visit to do work here that they cannot do at home. MACI is an outstanding example of the leveraging power of partnerships for the benefit of all.

Outstanding new faculty and graduate students will be attracted because of what they can do with MACI's resources; and others will visit to do work here that they cannot do at home.

The Humanities, Social Sciences and Fine Arts: Understanding Who We Are and What We Value

An economic impact study on Edmonton arts and culture, completed by Economic Development Edmonton in 1996, revealed that Edmonton's arts and culture community boosts the local economy by $75 million each year, in addition to providing an incalculable contribution to the city's (and the region's) quality of life.

University of Alberta's Timms Centre

Edmonton's renowned and varied arts and culture community is represented by 78 vibrant organizations. Arts and cultural events in Edmonton attract more than 2.7 million people each year, including nearly 550,000 out-of-town visitors. It is estimated that Edmonton's arts and cultural organizations employ nearly 2,100 full-time workers supplemented by 10,000 volunteers.

The University of Alberta plays a significant role in the Edmonton arts community, contributing to the cultural riches and diversity enjoyed by the people of Edmonton, and across Alberta, Canada and internationally. Students and graduates in drama, music and fine arts share their talents and expertise with audiences worldwide. Concerts and performances at the University of Alberta's Timms Centre and Convocation Hall, among other venues, showcase both local and international talent for audiences drawn from the University and beyond. Researchers in the social sciences continually provide new ways of understanding society and suggest the means to meet the many challenges it provides.

Building on Provincial Funding for New Facilities

Infrastructure renewal is an important priority for the University of Alberta at this time, as more money for research flows in and existing facilities are unable to accommodate the increasing demands of leading-edge research. Government programs, particularly the Alberta Innovation and Science Research Investments Program (ISRIP) and the Canada Foundation for Innovation (CFI), are helping post-secondary institutions with infrastructure renewal and development.

The most obvious current example on the University of Alberta campus is actually two inter-related facilities, now under construction. The Electrical and Computer Engineering Research Facility (ECERF) and the Engineering Teaching and Learning Complex (ETLC) demonstrate the effectiveness of the Alberta program. The two buildings have a combined cost of $73 million. Of this, the Alberta government has contributed $25,800,000, or 35.3% of the total cost. That level of funding in turn brought federal support (CFI) of almost $5 million, private or corporate support of more than $12 million (including one anonymous donation of $4.1 million) and a University of Alberta contribution of almost $15 million.

ECERF will include the most advanced micro-fabrication facility in Canada, and probably one of the five best in North America, according to Dr. Michael Brett, a Professor of Electrical Engineering and an acknowledged world leader in this field. The building will also house state-of-the-art facilities for telecommunications, information technologies, computer/software engineering, advanced laser applications and microelectronics. The Teaching and Learning Complex will contain classrooms, lecture theatres, and computer and instructional laboratories.

Sketch of the Electrical and Computer Engineering Research Facility (ECERF)

New teaching and research facilities will make the faculty of Engineering one of Canada's largest and finest.

The new buildings are directly linked to Provincial government strategies relating to the acceleration of knowledge-based activities in Alberta. At the same time they will make the University of Alberta's Faculty of Engineering one of the largest and finest in Canada. It is definitely a "win-win" situation, an excellent example of partnering for the future.

The "Edmonton Protocol" – Making Lives More Productive

The developers of the "Edmonton Protocol"

A University of Alberta research team has developed a revolutionary new treatment for people suffering from Type 1 Diabetes. Led by Dr. Ray Rajotte, the team includes Dr. James Shapiro, a transplant surgeon who developed the protocol used in the treatment, Dr. Jonathan Lakey, Dr. Greg Korbutt, and several other members. Now known as the "Edmonton Protocol", Dr. Shapiro's treatment has been successfully used to free patients from insulin by transplanting donor-pancreatic cells—cells needed to produce insulin—into eight people from Alberta, Saskatchewan and the Northwest Territories. They all needed as many as 15 self-injected insulin shots a day before the study.

The treatment is so striking that the *New England Journal of Medicine*, which published the results, released the University of Alberta study almost two months early and put it up on its Web site (www.nejm.org/content/shapiro/1.asp).

The transplants took place more than a year ago and since then, none of the patients has needed insulin injections and they no longer need to monitor their diet. A new immune-suppressant drug called Rapamune, which became available in the United States last year, is a crucial part of the treatment. It can be given in low doses and does not appear to have some of the side effects of most immune suppressants.

The first patient transplanted has gone 14 months without needing insulin, and half the patients have lasted almost a year. Shapiro said none shows signs of rejecting the cells or serious side effects from the transplant — which required only an injection, not surgery.

Cautious optimism exists that the "Edmonton Protocol" is a major breakthrough in the treatment of the most severe form of diabetes.

Although the long-term effects of the therapy are not yet known, cautious optimism exists that this is a major breakthrough in the treatment of the most severe form of diabetes. The benefits are many, the most important of which is healthier, productive lives for the diabetics and their families. And if the treatment is in fact a long-term solution, fewer people will develop complications from diabetes, meaning that the health-care system itself benefits, as does society.

Quick Facts about the University of Alberta

2000-2001 Budget (in millions of dollars)

Alberta Government Base Funding:	$238.0
Alberta Access/Conditional Funding:	21.9
Tuition and fees:	93.2
Sponsored research funding*:	223.7
Investment and Endowment Earnings (non-research) Transfers/Appropriations:	23.1
Departmental Earnings:	44.2
Special Purpose Funding:	60.3
Ancillary Operations:	54.3
Capital Programs and Projects:	106.5
Total:	**$865.2**

* Includes approximately $24 million in clinical trials and TRIUMF funding

Annual payroll (1998-99): $365 million

Number of Employees (1998-99)

Academic Staff	2,737
Academic Assistants	1,987
Support Staff	3,147
Trust Staff	1,908
Total:	**9,545**

Year-Round Enrolment (1998-99)

"Year Round" includes Winter Session, Spring and Summer Sessions in degree credit programs. Students registering in more than one session are counted only once.

Full-time:	27,364
Part-time:	6,100
Total:	**33,464**

Winter Session Enrolment (1998-2000)

	1998-99	1999-2000
Undergraduate students:	25,711	25,893
Graduate students:	4,621	4,780
Total*:	**30,332**	**30,673**

* Includes Full and Part-Time students

Faculty of Extension Enrolment (1998-99)

Extension Students (in non-degree courses):**14,541**

Programs and Faculties

Number of Faculties and Schools:	16
Number of Undergraduate Programs:	200
Number of Graduate Programs:	170

Graduates (1999)

Bachelors and Professional Degrees	5,239
Masters	827
Doctoral	283
Total Degrees Granted:	**6,349**

University of Alberta:

Its Economic Impact

University of Alberta: Its Economic Impact

University of Alberta:
Its Economic Impact, 2000

was created by
The Office of the Vice-President (Research)

The Office of the Vice-President (Research) acknowledges with thanks the assistance of the Director, Strategic Analysis, the Office of Public Affairs, the Faculty of Engineering, the Alberta Heritage Foundation for Medical Research, the University of Lethbridge, and Economic Development Edmonton in providing source material for this publication.

For additional information:

Fax: (780) 492-3189
E-mail:david.norwood@ualberta.ca
Web: www.ualberta.ca/~univhall/vp/vprea/