



SIMON FRASER UNIVERSITY

Spin-off Company Survey 2000 Report

Prepared for the
Simon Fraser University
University/Industry Liaison Office

Survey conducted and report prepared by:



May 2001

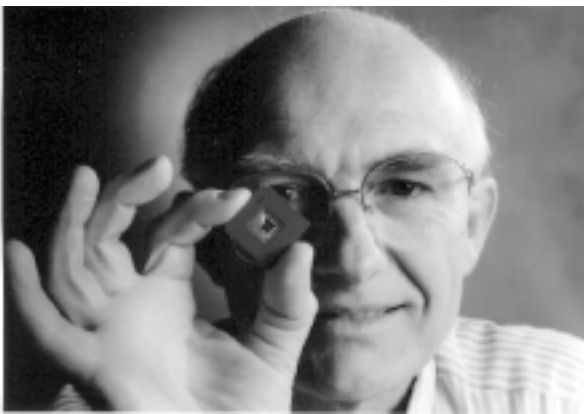


1. Introduction

1.1 Background

Technology transfer and commercialization of innovations resulting from university research are increasing sources of business development and economic diversification.

Dr. Rick Hobson of Cogent Chipware Inc. is looking at custom integrated chip design in a new way.



When a university-developed technology is identified as having commercial application and business potential, it may be transferred via a license of the intellectual asset to an existing company. However, for a variety of reasons, including the lack of a receptor company, the commercialization route may begin with the formation of a new start-up company (“university spin-off company”) which, via a license agreement or assignment of the technology from the university, becomes the receptor. Simon Fraser University (SFU) has a history of entrepreneurship, taking early stage inventions and expertise and building local businesses based on these innovations.

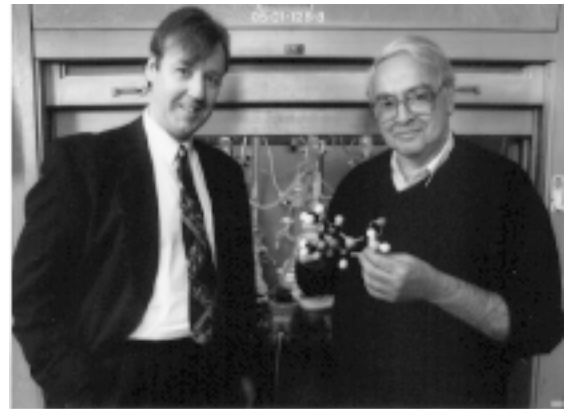
The SFU Spin-off Company Survey 2000 was conducted on behalf of SFU by WestLink Innovation Network Ltd., a not-for-profit network linking the technology commercialization offices of Western Canadian Universities and their associated research institutions. SFU is a core member of this network and is a leader in Canada and North America in terms of commercialization success.

The survey process and the software database tool that enables the management of the data collected was originally developed by the University of British Columbia (UBC) University-Industry Liaison Office to document the ongoing growth and success of spin-off companies originating from UBC research. When WestLink was formed in 1999, the documentation and promotion of this type of commercialization success was identified as a priority of the WestLink Membership. Through an agreement with UBC, WestLink is now developing the process and supporting the database as a continuing service to its members.

In 1999, SFU served as the beta test site for the process of adapting the UBC survey instrument and database for use by other Western Canadian universities. A baseline survey was conducted and the database was populated with the resulting data.

The SFU Spin-off Company Survey 2000 was conducted on behalf of SFU by WestLink Innovation Network Ltd., a not-for-profit network linking the technology

Hugh MacNaught (left) and Dr. Saul Wolfe of Chirologix Pharmaceuticals Inc. The company is developing novel antibacterial agents.





In the year 2000, SFU became the second of three WestLink members to have a spin-off company survey conducted on their behalf by WestLink. A similar service was provided to UBC and to the University of Alberta (U of A). A three-university compilation report will be available through WestLink and the three participating members in the coming months.

The following report is based on the results of the SFU Spin-off Company Survey 2000 and also references the findings of the 1999 baseline survey.

1.2 Overview of the Survey Process

The 2000 survey of SFU spin-off companies was conducted over a three-month period from June to August 2000, with data gathered for the period ending August 31, 2000. At the time of the survey, SFU had created 55 spin-off companies, starting as early as the 1970s¹. Of these, 41 companies were identified as early-stage and/or active and were therefore included in the survey.

Introduction letters were sent to those 41 companies, followed by personal interviews in which questionnaires were completed, either by phone or (as in the majority of cases) at the companies' facilities. Some questionnaires were completed via fax or e-mail. Internal and external sources were used to obtain supplemental information required to complete the data. This additional data included information about research funding, royalty receipts, sources of original research funding, university investment in the evaluation, protection and development of the technologies, and the value of current equity holdings. The survey revealed that five of the 41 companies were in fact inactive or closed. Of the remaining 36 companies, 32 responded to the survey and data was researched on the remaining four companies.² The information presented in this report represents data from those 36 companies. All information on individual companies is maintained in confidence, with only aggregate information being presented.

Dr. Jiawei Han's company, DBMiner Technology Inc., is commercializing data warehouse and relational database mining tools.



¹ See Appendix I for a list of SFU spin-off companies.

² At the time of the baseline survey, conducted in August of 1999, 36 companies were sent an introduction letter and 31 of these companies responded to the survey questions.



1.3 Spin-off Definition and Criteria (What is a Spin-off Company?)

An SFU spin-off company is an incorporated commercial entity, which derives a significant portion of its commercial activities from the application or use of a technology and/or know-how developed by or during an SFU research program. The process leading to its formation may take many forms. Acceptable models include the creation of a new company, or modification of an existing company, or bundling of existing companies for the purpose of creating the commercial vehicle through which an SFU technology is developed and licensed. This commercial activity may be in collaboration with other organizations.

SFU's spin-off company criteria are:

1. Includes companies:
 - founded to commercialize intellectual property which has been a) assigned to the University by an SFU researcher and b) subsequently licensed to the company by SFU in exchange for an equity interest in the company and/or a share in royalties;
 - in which a) an SFU faculty member is a principal, b) the formation of the company was dependent on SFU-developed technology which may or may not have been assigned to SFU, and c) the University/Industry Liaison Office or SF Univentures Corporation (a wholly-owned SFU company) have provided commercialization services to the company and/or funding toward technology development;
 - in existence but significantly reconstituted around technology licensed from SFU.
2. Does not include sole proprietorships, faculty consulting companies, companies formed by SFU alumni unless SFU-developed technology has been transferred to the company, or holding companies.

Levels

- Level 1: founded to commercialize SFU technology and/or significantly reconstituted around technology licensed from SFU, and SFU University/Industry Liaison Office involved in commercialization.
- Level 2: founded to commercialize SFU technology.
- Other: Company principal(s) or SFU UILO deem level and nature of collaboration significant.

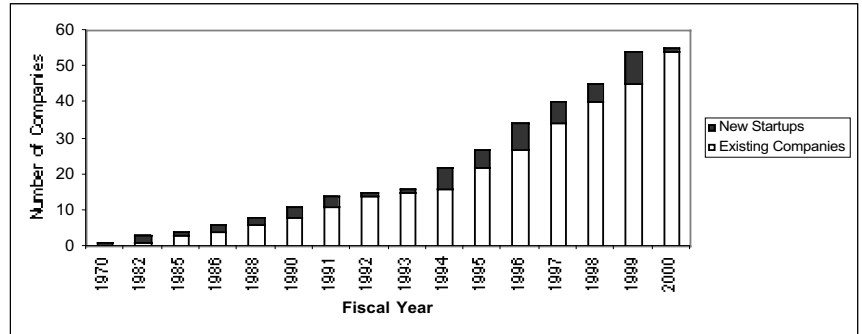


1.4 Historical Company Formation – By Year

The total number of SFU spin-off companies formed at the time of the 2000 survey was 55. The survey focused on confirming the status of these companies and for those defined as active, documenting their demographics,

and detailed business progress and growth. The survey revealed that 5 of the 41 companies assumed to be active were, in fact, inactive or closed, leaving 36 companies either in the early-stage or active.

Graph 1: Companies by Year Formed



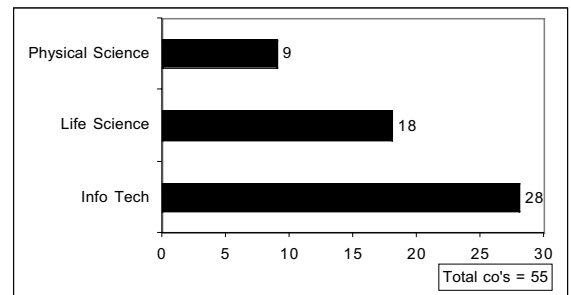
2. Company Demographics

The graphs in this section of the report include data from the total number of SFU spin-off companies (55) regardless of stage of development (early-stage, active, inactive).

2.1 Sectoral Distribution

In a sectoral comparison, 16% (9 of 55) of the total SFU spin-off companies are in the Physical Sciences Sector, 33% (18 of 55) are in the Life Sciences Sector and 51% (28 of 55) are in the Information Technology Sector.

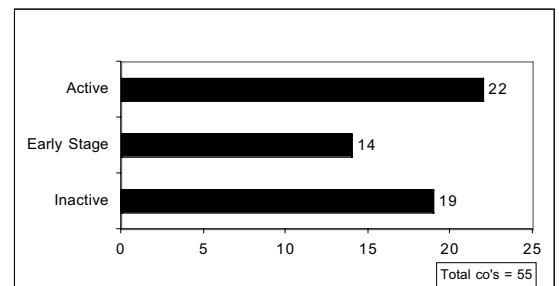
Graph 2: Companies by Sector



2.2 Operational Status

Thirty-five percent (19 of 55) of the total companies are inactive. Twenty-five percent (14 of 55) of the companies are in the start-up stage and the remaining 40% (22 of 55) are active.

Graph 3: Operational Status

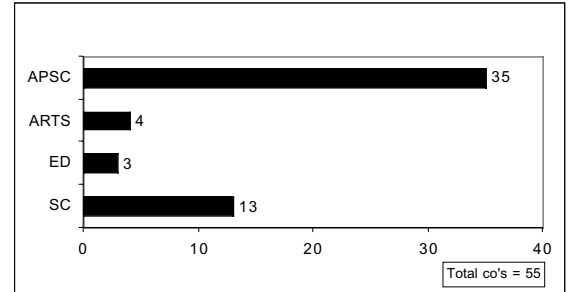




2.3 Faculty of Origin

Of the five faculties at SFU, four faculties have created spin-off companies. Applied Sciences has created the greatest number of companies accounting for 64% (35 of 55). The Faculty of Science follows with 24% (13 of 55), the Faculty of Arts has spun-off 7% (4 of 55) and companies formed based on research conducted in the Faculty of Education comprise 5% (3 of 55).

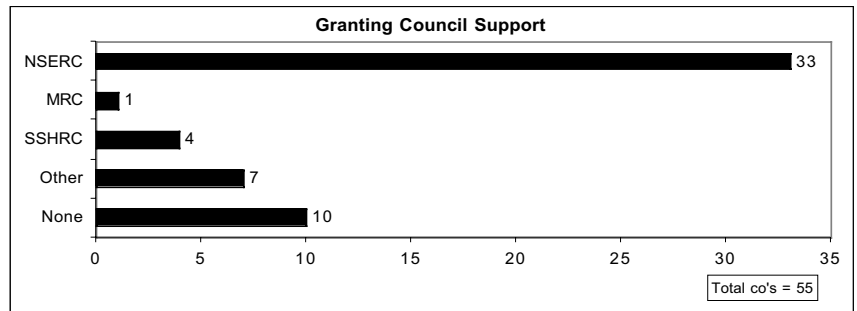
Graph 4: Faculty of Origin



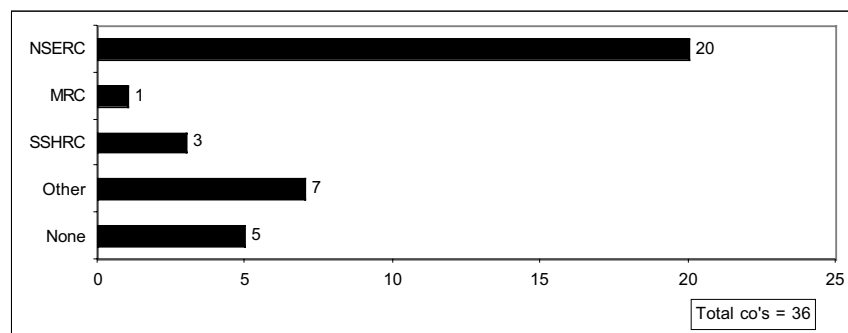
2.4 Granting Council Support

Graphs 5 and 6 depict the number of SFU spin-off companies formed to commercialize technology developed as a result of research supported by one of the three major Canadian federal research granting councils: the Natural Sciences and Engineering Research Council (NSERC), the Medical Research Council (MRC) now Canadian Institutes of Health Research, and the Social Sciences and Humanities Research Council (SSHRC). Some companies reported other, unspecified sources.

Graph 5: Granting Council Support – All Companies Year 2000



Graph 6: Granting Council Support – Active Companies in Year 2000

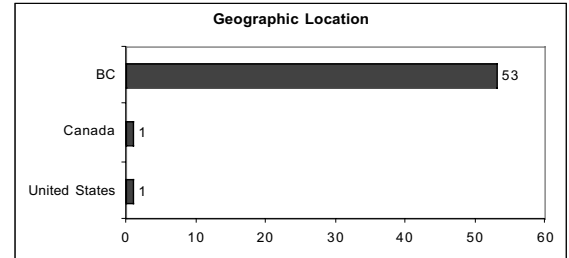




2.5 Geographic Location

Of particular interest is the fact that 96% of the companies are located in British Columbia. This illustrates the local economic advantage and benefits that accrue from the development of University spin-offs. It also reaffirms anecdotal evidence that technology-based start-ups prefer to stay close to the source of these technical innovations, particularly when that source is a university, which can become an excellent ongoing partner for collaborative research and development.

Graph 7: Geographic Location



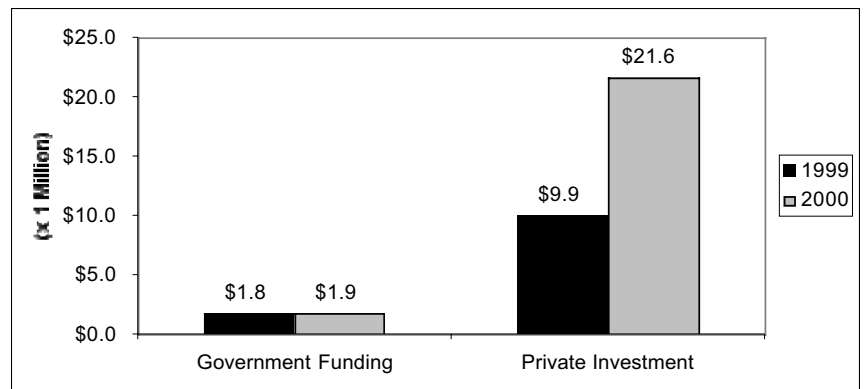
Total companies: 55

3. Survey Highlights

3.1 Investment

In 1999/2000 SFU spin-off companies obtained \$1.9 million from government support programs. This classification of funding source is very broad, and includes programs such as those offered by, for example, the National Research Council – Industrial Research Assistance Program, the Science Council of British Columbia, the BC Advanced Systems Institute, and other Federal and Provincial agencies. In addition, cumulative private investment into these companies in that year totals over \$20 million.

Graph 8: Source of Spin-off Funding – Survey Year 2000



Number of respondents to the survey question:

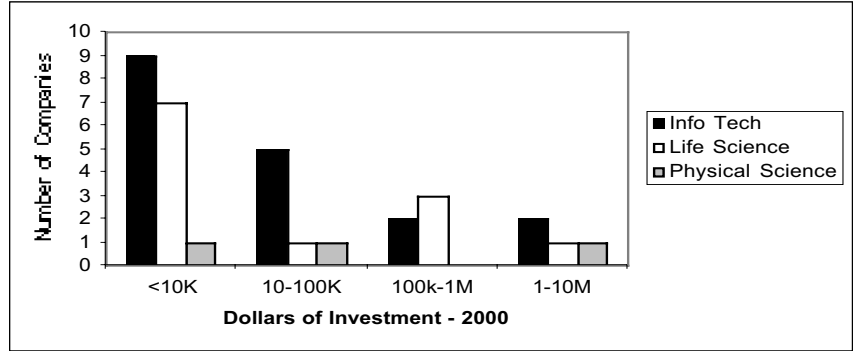
Year	Government Funding	Private Investment
1999	30/31	29/31
2000	32/36	31/36

Note: Not all companies fully documented their government funding and/or private investment elements for business development or ongoing research in their survey responses. The University has invested in the technologies (University/Industry Liaison Office staff time and expenses, patenting fees, and prototype and business development costs) - these investments are not reflected in graphs 8 and 9).

3.2 Investment Profile

The survey results indicated that a large proportion of the companies secured private investment at total financing levels less than \$10 million. The level of investment is normally higher in the information technologies sector, as indicated by graph 9.

Graph 9: Investment Histogram Breakdown by Sector – Survey Year 2000

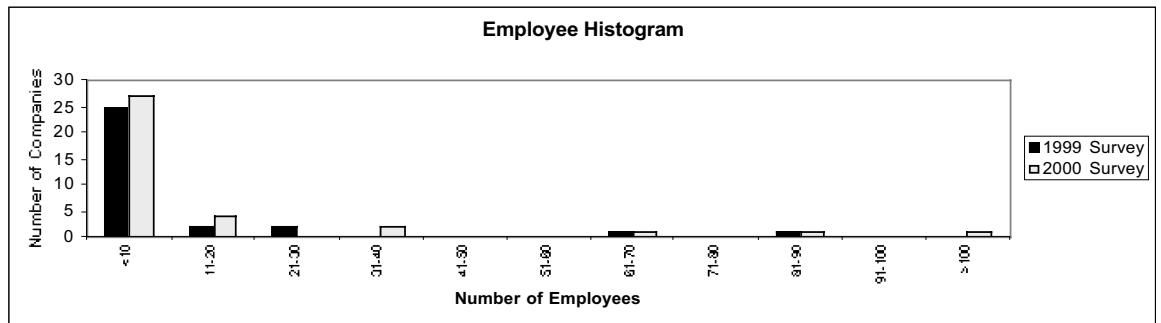


Number of respondents to the survey question:	Year	Private Investment
	1999	29/31
	2000	31/36

3.3 Job Creation

Collectively, the 36 companies are responsible for the creation of 454 jobs. This includes 375 staff positions, 59 contract positions and the support of 20 graduate students at the University. Of the 454 jobs, 30 were indicated by the companies to be newly hired university graduates. Though the majority of the companies have fewer than 10 employees, 8 companies indicated that they employ more than 10 people, and 1 company indicated that it had more than 100 employees.

Graph 10: Employee Histogram – Survey Year 2000



Number of respondents to the survey question requesting the below types of employment:

Year	Full-time Employees	Contract Employees	Grad Students Sponsored
1999	31/31	30/31	30/31
2000	33/36	34/36	34/36



Other highlights of the survey include:

- The collective revenue from sales by all companies is \$ 5.6 million.
- 25 companies reported their collective use of over 500,000 square feet of lab, office, and production space.
- There have been 5 second-generation companies spun-off from the existing spin-off companies

3.4 Social Benefits

In addition to the economic and financial benefits that these companies provide, there are social and cultural benefits that have resulted from their efforts, and are summarized as the qualitative impacts of what their company provides to society at large.

Twenty-three out of the 32 companies that responded to the survey answered the question about what social benefits their company provides. Responses received included:

Social

- Providing a filter mechanism to select media content for various audiences.
- Enhancing public safety.
- Enhancing distance learning and providing more effective online teaching.
- Potential cost savings to policing agencies through more effective searching for criminals. Faster identification and removal from society of criminals.
- Increasing quality of life due to increased exposure to art.

Health

- May reduce patient time and technician anxiety through fewer errors.
- Potential to reduce health care delivery costs while increasing quality of health care.
- Potential for improved treatment which may reduce pain and suffering and may reduce missed time at work.
- Gain of independence by disabled people.

Environment

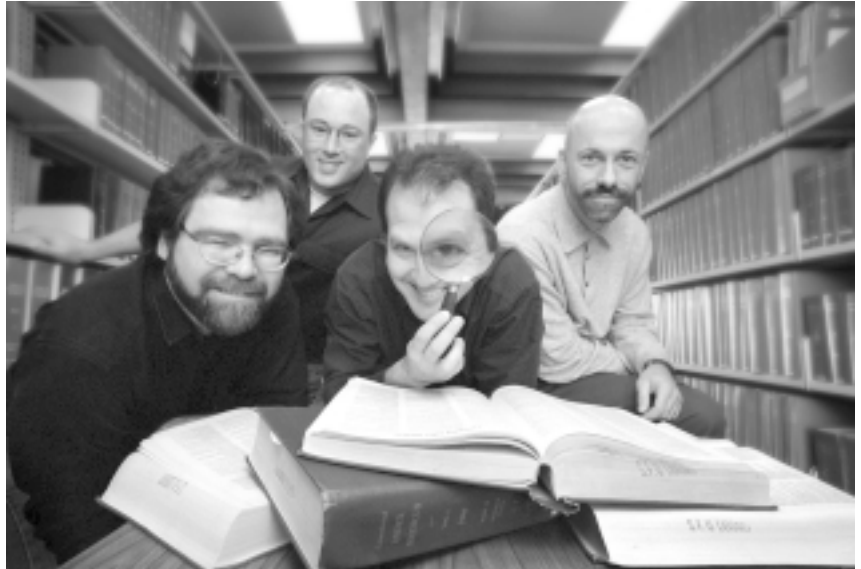
- Applications of advanced materials create value and contribute to a better environment (in areas of decreasing air pollution and clean air and clean water).



- Potential energy savings due to saving electricity.
- Easier environmental monitoring.

The respondents tended to be focused on the issue at hand – commercial success based on particular products or services. We would suggest that the broader benefits of their

contribution to the local technology community also be considered. These benefits include the employment of university graduates, support of research at SFU (and other institutions), their contributions to diversifying the B.C. economy, and the emerging establishment of a high-tech presence and image within the Province. The companies have also attracted significant new capital investment to the region, which leads to a net economic gain that has ongoing ripple benefits, not to mention increasing the local tax base. These types of impacts are not always apparent at the individual company level, but when the net contribution of the group is considered, these spin-offs are a very positive element of the local economic landscape.



l-r: Paul McFetridge, Devlan Nicholson, Fred Popowich, and Davide Turcato of gavaagai Technology Incorporated. The company is developing knowledge retrieval products.

4. Returns to the University

4.1 Research Funding

In Fiscal Year 1999/2000, SFU spin-off companies contracted \$60,000 worth of research back to SFU. This additional research revenue helps support the research infrastructure and labs of the University.

4.2 Equity

At the time of the survey, SFU held equity in 18 spin-off companies. All of these companies are privately held; 5 companies (28%) are in the life sciences sector and the remaining 13 (72%) are in the information technologies sector.



5. Success Factors

This survey exercise is a first step in documenting the economic, social, and scientific impact that companies spun-out of SFU have made on a local and national scale. Ongoing discussion with WestLink Member institutions who are active in the spin-off company formation area, combined with resident experience within WestLink, have led to the following summary of the factors that contribute to successful participation / assistance by a University in the spin-off company creation process.

5.1 Pre-requisites for Successful University Participation in Spin-off Creation

The first element that is needed to achieve successful spin-off company creation is a strong foundation in excellent research. A large proportion of Western Canadian university spin-off companies have been founded on technology inventions that resulted from traditional curiosity driven research funded by the federal granting councils. This is somewhat contrary to a prevailing assumption that in order for a spin-off company to be commercially viable, the bulk of the research activity driving the original innovation must result from applied or industrial sponsored research.

It must be noted, though, that there is indeed significant commercial activity that is created based on results from applied research projects conducted at universities. However, these innovations tend to be commercialized through the sponsoring partner, and do not normally lead to the creation of a new spin-off company.

Building on a core of excellent research, the following elements are needed to promote spin-off company creation:

- A proactive Industry Liaison / Technology Transfer office with:
 - the commitment and resources to help invest in and develop the intellectual property and prototypes at the very earliest stages;
 - adequate program and project financing;
 - an effective and efficient commercialization process;
 - available space and facilities to help the fledgling companies get their initial start before moving to commercial addresses;
 - a “can do” attitude, both from the UILO and from the entrepreneurial researchers;
- A supportive University environment, including;
 - senior administration support and recognition of the role and benefits of technology commercialization to enhance the core university mandates of teaching, research, and public service.



- sound guidelines and a policy framework that acknowledges the challenges of balancing company creation with continuing to support an effective research program.
- Synergistic relationships between all stakeholders.

In institutions where the development of spin-offs has been a focus, each one has consistently confirmed the need for government funding to support both the University's efforts to transfer technology, as well as to support mechanisms to assist companies' continued research and development as they attempt to arrange initial financing.

There is a constant demand for space to house start-ups in close proximity to the campus and for easy access to university services and facilities, and to allow the founding researchers to balance their academic and business activities, particularly at the earliest stages of the formation of a spin-off company.

Simon Fraser University has created two incubator facilities: the Business Development Centre located in Discovery Park adjacent to the Burnaby campus, and the TIME Ventures Innovation Incubator located at SFU's Harbour Centre campus in downtown Vancouver. These facilities act as incubators for entrepreneurial researchers requiring the space and resources to get their company established at a location other than the academic laboratory.



CrimePatterns.com, developed by (l-r) Mr. Terry Whin-Yates, Drs. Patricia and Paul Brantingham is a crime pattern analysis technology being commercialized by SFU spin-off company Crime Prevention Analysis Lab (CPAL) Inc. Also shown, far right, Ms. Teri Lydiard, UILO Technology Manager.

5.2 Contributing Factors to Spin-Off Company Success

From the perspective of the operational success of the company, it needs to be built on a strong technology foundation and exploitation of competitive advantage through effective intellectual property protection. Successful technology companies are not built on one product, but on the ability to use their research and technical advantages in an adaptive manner which keeps them ahead of their competition. When evaluating a technology for possible spin-off company formation, the



following elements must be considered:

- understanding of the long-term technology commercialization opportunity (its scalability, manufacturability, applications, and marketability);
- a focus on commercializing the benefits of a technology rather than the technology itself;
- a clear plan of what the next generation product will be, or needs to be, in order to remain competitive.

In terms of business planning, the challenges of establishing any technology-based company apply equally to a university spin-off, including the need for a clear business plan, sound management, budget forecasting and a financing strategy, and a well organized and achievable marketing and production plan. Additional considerations within the university context are:

- recognition of the needs and priorities of the academic community and university responsibilities relative to the commercial plans of the company – and a strategy to keep them clearly delineated;
- clear lines of reporting and obligation, and an awareness of the risks of conflict of interest and conflict of commitment;
- a well understood development program with recognition of the progression needed from the research focus to the commercialization focus – with an emphasis on the critical nature of the time to market;
- communication on a regular basis to keep all parties informed.

Contributing factors to the successful launch of a spin-off company include:

- a champion who lives and breathes to see the company succeed;
- finding management with proven experience in the particular high technology sector;
- an understanding of the market opportunity;
- access to financing at all stages (technology development, seed capital, venture capital, and public markets);
- an experienced board of directors;
- the ability to access experienced R&D personnel and facilities; and,
- a solid, well-understood and protected technology.

Assembling the elements needed to create and grow a new spin-off company is a daunting task, but the success shown at SFU and other institutions indicates that it can be achieved. The ongoing commitment of the SFU UILO will be a key factor in the continued success and support of B.C.'s growing technology community.



6. Conclusion

SFU is one of Canada's leading institutions in terms of commercialization of research results via spin-off company formation. SFU has spun-out a total of 55 companies since the early 1970s, resulting in the employment of more than 450 people in B.C. in the 1999/2000 Fiscal Year. Only 35% of the companies formed have become inactive, with the remainder continuing to commercialize their technologies and expertise and benefitting the economy at a local and global scale.

SFU's University/Industry Liaison Office has an effective system to support new entrepreneurial activity and spin-off creation. With a continued positive relationship and support from Federal and Provincial Governments, as well as the local business community, commercialization of innovations resulting from SFU research will continue to contribute to the local economy and bring returns to the University and its stakeholders.



Dr. Thor Borgford's company, Twinstrand Therapeutics Inc., specializes in the development of recombinant therapeutics for the treatment of human diseases.



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Note: The layout and data reports included in this document are adapted from “UBC Report on Spin-off Company Formation and Growth” by Angus Livingstone, University of British Columbia, University-Industry Liaison Office (1997). WestLink and its members’ intend to develop this report format as a consistent platform for all members that participate in these surveys in the future.

SFU Editor, Deborah Stupnikoff
Design and layout, Holli Edgelow
Photos, Greg Ehlers, SFU IMC



Appendix 1

Simon Fraser University spin-off company survey report 2000

YEAR FORMED	COMPANY NAME	STATUS	CONTACTED FOR SURVEY 2000	RESPONDED TO SURVEY 2000	
1	1970	CTF Systems Inc.	Active	Yes	Yes
2	1982	Canadian Kelp Resources Ltd.	Active	Yes	No
3	1982	Phero Tech Inc.	Active	Yes	No
4	1985	Richardson Industries/Quest Scientific	Inactive	No	No
5	1986	Andrew Engineering Inc.	Inactive	Yes	Yes
6	1986	Applied Brain Behaviour Systems Limited (ABBS)	Active	Yes	Yes
7	1988	Pacific Pearl Culture Ltd.	Active	Yes	No
8	1988	White Knight Software Corporation	Inactive	No	No
9	1990	Intertech Systems Inc.	Inactive	No	No
10	1990	Kinetic Effects Inc.	Inactive	No	No
11	1990	Pacific Fluorotec Corporation	Inactive	No	No
12	1991	Credo Multimedia Software Inc. (was Kinetic Effects Research Inc.)	Inactive	No	No
13	1991	Echidna Research Corporation	Inactive	No	No
14	1991	LSL Living Seafoods Ltd.	Active	Yes	Yes
15	1992	MTC Micromachining Technology Centre Ltd.	Inactive	No	No
16	1993	Western Pacific Research Corp.	Inactive	Yes	No
17	1994	Bourne Cushing Technologies	Inactive	No	No
18	1994	Centrinity Inc. (was MC2 Learning Systems, Inc.)	Active	Yes	No
19	1994	Environmental Criminology Research Inc. (ECRI)	Active	Yes	Yes
20	1994	GeoSync Interactive Corporation	Inactive	No	No
21	1994	NCompass Labs Inc.	Active	Yes	Yes
22	1994	Neural Technologies	Inactive	No	No
23	1995	Infusion Systems Ltd.	Active	Yes	Yes
24	1995	Pestana Enterprises Ltd.	Active	Yes	No
25	1995	Twinstrand Therapeutics Inc. (was De Novo Enzyme Corporation)	Active	Yes	Yes
26	1995	Vera Genics Ltd. (was Viratest Carcinogen Monitoring Ltd.)	Active	Yes	No
27	1995	Welichem Biotech Inc. (was Welchem Technology Inc.)	Active	Yes	Yes
28	1996	Canadian V-Chip Design Inc.	Active	Yes	Yes
29	1996	Credo Interactive Inc.	Active	Yes	Yes
30	1996	ICue Technology Inc.	Early Stage	Yes	No
31	1996	Lightwave Computer Technology Ltd.	Inactive	Yes	Yes

continued...



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Simon Fraser University spin-off company survey report 2000

YEAR FORMED	COMPANY NAME	STATUS	CONTACTED FOR SURVEY 2000	RESPONDED TO SURVEY 2000
32	1996 Neologos Technologies Inc.	Inactive	No	No
33	1996 PhageScreen Incorporated	Inactive	No	No
34	1996 Virtual Learning Environments Inc.	Active	Yes	Yes
33	1996 PhageScreen Incorporated	Inactive	No	No
34	1996 Virtual Learning Environments Inc.	Active	Yes	Yes
35	1997 ConstraintWorks Incorporated	Early Stage	Yes	Yes
36	1997 DBMiner Technology Inc.	Early Stage	Yes	Yes
37	1997 LearnQuest Inc.	Inactive	No	No
38	1997 NeuroStream Technologies Inc.	Early Stage	Yes	Yes
39	1997 Reality Designs Inc.	Active	Yes	Yes
40	1997 TRIMP Tech(nologies) Inc.	Active	Yes	Yes
41	1998 Agnitor Technologies Inc.	Inactive	Yes	No
42	1998 Applied Medical Devices Inc.	Active	Yes	Yes
43	1998 Chirologix Pharmaceuticals Inc.	Active	Yes	Yes
44	1998 Figaro Educational Software Inc.	Early Stage	Yes	Yes
45	1998 Insight Technologies	Inactive	Yes	Yes
46	1999 Cogent ChipWare Inc.	Early Stage	Yes	Yes
47	1999 CPAL Crime Prevention Analysis Lab, Inc.	Early Stage	Yes	Yes
48	1999 CPC Crop Pollination Consultants Ltd.	Early Stage	Yes	Yes
49	1999 gava'ai technology Incorporated	Early Stage	Yes	Yes
50	1999 HandView Inc.	Early Stage	Yes	Yes
51	1999 Lightyear Tehcnologies Inc. [Replaces Rend Technologies Ltd.]	Active	Yes	Yes
52	1999 Smart Sense Innovations	Early Stage	Yes	Yes
53	1999 TELESTraining Inc.	Early Stage	Yes	Yes
54	1999 ThoughtShare Communications Inc.	Early Stage	Yes	Yes
55	2000 Dermex Therapeutics Inc.	Early Stage	Yes	Yes
Totals			41 Yes	32 Yes

Data compiled by:

