

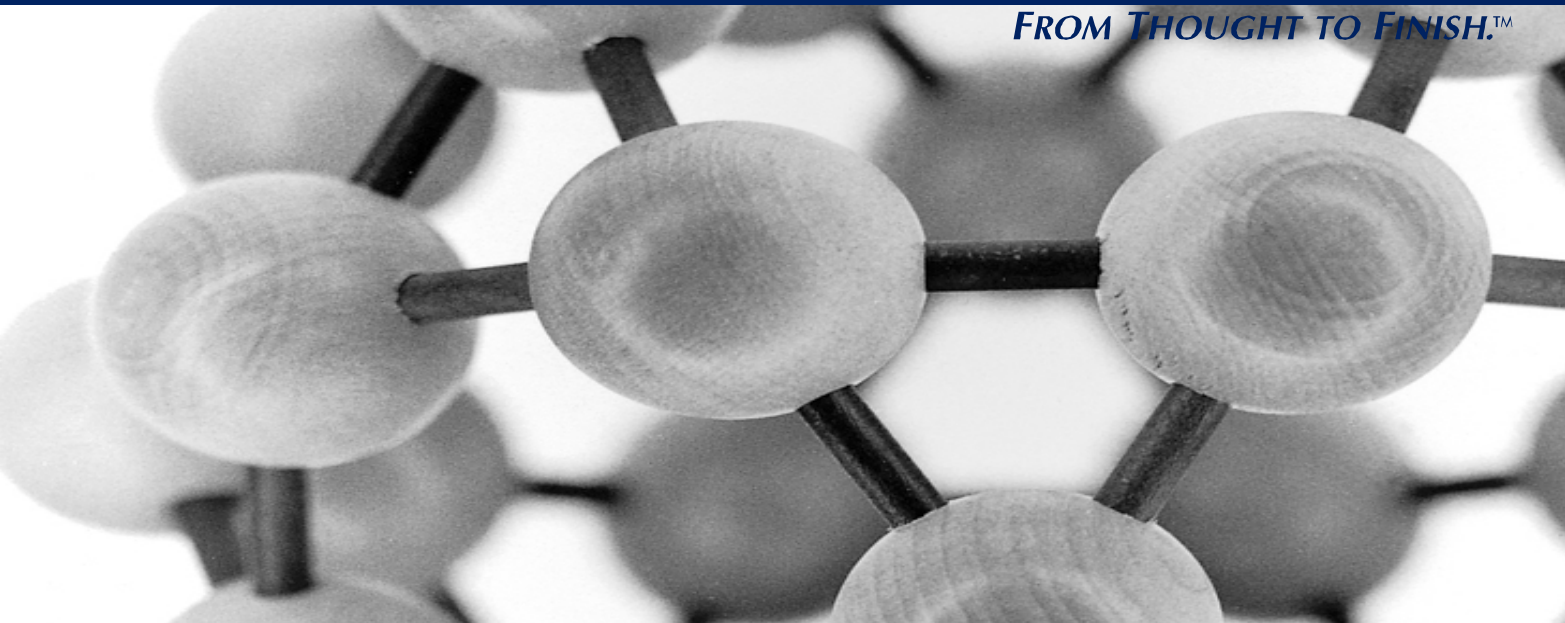


# Queensland Biotechnology Report 2001

Department of Innovation and Information Economy

 **ERNST & YOUNG**

*FROM THOUGHT TO FINISH.™*



## INTRODUCTION

This Report was commissioned by the Emerging Technologies Program of the Department of Innovation and Information Economy.

Ernst & Young is pleased to introduce the 2001 Queensland Biotechnology Report on behalf of the Department of Innovation and Information Economy. This report follows on from the first report published in October 1999 and provides a comprehensive analysis of the biotechnology industry in Queensland, including current statistics, future trends and insights into the major issues facing the industry. This updated report provides a broader and more comprehensive analysis of the growth and change in the Queensland biotechnology industry since the first report launched in 1999.

The 1999 Queensland Biotechnology Report set the scene for the future direction of the industry. This Report presents the key findings from survey data obtained for the June 2001 Queensland Biotechnology Survey.

Key findings of this Report include the following:

- **67% (815 positions)** overall industry **growth** in employment since the 1999 Report, from 1,225 to 2,040.
- **317% (\$151.9 million) increase** in R&D spending since the 1999 Report, from \$47.9 million to \$199.8 million.
- **248% (\$178.6 million) increase** in funds raised since the 1999 Report, from \$72.2 million to \$250.8 million.

## EMPLOYMENT GROWTH

Actual growth benchmarked over the surveyed period was 67%, which was greater than the projected growth rate of 60% identified in our 1999 Report. Respondents expect by June 2002 there will be additional 652 jobs generated in this industry in Queensland (a 32% growth rate), with a further projection of an additional 981 jobs by the end of the 2002/03 financial year (a 36% growth rate).

*Table A*

### Employment Growth

Market Segment	October 1999 Report	June 2001 Report	Projected 2001/02	Projected 2002/03
Core Bioindustry firms	186	217	334	487
Research institutions	903	1,756	2,267	3,068
Service providers and firms with a biotechnology application	136	67	91	118
<b>Total</b>	<b>1,225</b>	<b>2,040</b>	<b>2,692</b>	<b>3,673</b>
<b>Growth numbers</b>		<b>815</b>	<b>652</b>	<b>981</b>
<b>Growth %</b>		<b>67%</b>	<b>32%</b>	<b>36%</b>

Source: Survey data Ernst & Young 1999 and 2001. (n=59)

Research institutions are expecting to generate the most jobs with an increase of 511 new jobs projected for the next 12 months, and a further 801 additional new jobs projected by the end of the 2002/03 financial year

## RESEARCH AND DEVELOPMENT SPENDING

Actual growth benchmarked over the surveyed period was 317%, which was greater than the projected growth rate of 13% identified in our 1999 Report. Spending on research and development has increased by almost \$200 million in 2001, and is projected to increase a further 25% in 2001/02 to \$250 million, and increase 18% to almost \$294 million by the end of the 2002/03 financial year.

Research institutions contributed the majority of the growth in research and development spending in 2001 with a 529% (\$155.6 million) increase compared with the 1999 Report. Research institutions have projected an additional \$17 million increase in research and development spend for the next 12 months, and a further \$19 million by the end of the 2002/03 financial year.

Whilst core biotechnology firms spent \$16.7 million less in 1999/2000 than respondents had projected in the 1999 Report, these organisations have now projected an increase in research and development spending of 291% (\$27 million) in the next 12 months, and an additional 67% (\$25 million) by the end of the 2002/03 financial year.

*Table B*

### Research and Development Spending

Category - R&D Spending	October 1999 Report \$ million	June 2001 Report \$ million	Projected 2001/02 \$ million	Projected 2002/03 \$ million
Core Bioindustry firms	14.6	9.3	36.4	60.9
Research institutions	29.2	183.7	200.9	220.2
Service providers and firms with a biotechnology application	4.1	6.8	13.0	13.3
<b>Total</b>	<b>47.9</b>	<b>199.8</b>	<b>250.3</b>	<b>294.4</b>
<b>Growth- \$ millions</b>		<b>151.9</b>	<b>50.5</b>	<b>44.1</b>
<b>Growth %</b>		<b>317%</b>	<b>25%</b>	<b>18%</b>

Source: Survey data Ernst & Young 1999 and 2001. (n=59) \* part of the additional growth in R&D expenditure in 2001 may be attributed to the additional 19 survey responses compared with 1999. % have been rounded.

## FUND RAISING

Actual growth benchmarked over the surveyed period was 248% (approximately \$250 million). Respondents expect by June 2002 they will raise an additional \$30.5 million, representing approximately 12% growth over this period.

Research institutions contributed most of the growth in funds raised in 2001 with a 266% (\$97.2 million) increase compared with the 1999 Report. The industry as a whole predict a decrease in the amount of funds they expect to raise in the 2001/02 financial year.

*Table C*

### Funds Raised

Category - Funds raised	October 1999 Report \$ million	June 2001 Report \$ million	Projected 2001/02 \$ million
Core Bioindustry firms	27.6	64.4	63.7
Research institutions	36.6	133.7	97.6
Service providers and firms with a biotechnology application	8.0	52.7	120.0*
<b>Total</b>	<b>72.2</b>	<b>250.8</b>	<b>281.3</b>
<b>Growth - \$ millions</b>		<b>178.6</b>	<b>30.5</b>
<b>Growth %</b>		<b>248%</b>	<b>12%</b>

Source: Survey data Ernst & Young 1999 and 2001. (n=59) \* includes 1 respondent projecting to raise \$80 million.

## QUALITATIVE HIGHLIGHTS

- *Impediments to Growth*

Despite the significant increase in funds raised, respondents identified the major impediment for the Queensland biotechnology industry continues to be the availability of capital. Access to funding at all stages of an enterprises life cycle is seen as essential to the continued growth of the industry in Queensland.

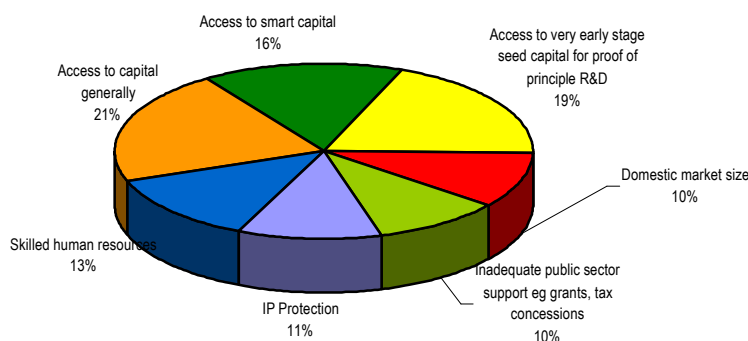
The majority of respondents also indicated the following impediments to growth for the Queensland biotechnology industry:

- Shortage of skilled human resources;
- Effective protection of intellectual property;
- Inadequate public sector support (e.g. grants and tax concessions); and
- The relatively small size of the domestic market.

The following chart presents the combined results of all respondents in relation to the key impediments to growth for the Queensland biotechnology industry. As discussed previously the main impediment is access to capital.

*Chart 1*

**Top 7 Obstacles to Commercialisation  
for the Queensland Biotechnology Industry**



Source: Survey data Ernst & Young 2001 (n=55)

It has evolved from the survey that whilst Queensland has an excellent R&D base, our ability to commercialise R&D is hampered by a shortage of business and commercial expertise. According to respondents, State Government initiatives such as the Bachelor of Biotechnology Innovation may assist this issue over the medium term.

The key impediments to growth remain similar to those identified in our 1999 Report.

- ***Strategic Direction***

Respondents indicated that their key strategic decisions focussed around negotiating new alliances, growing the size of their organisation and raising further capital.

- ***Confidence in Business Conditions***

Factors such as the availability of sufficient skilled resources, continued economic and political stability and investment incentives are key determinants of the level of business confidence amongst the respondents.

- *Strategic Alliances*

Respondents have established over 200 research and development focused alliances within Australia and the United States. Collaborations established within Australia are stronger than those established internationally.

Business related collaborations are less common amongst respondents, with approximately 100 alliances reported - the majority of these being Australian focused.

- *Products under development*

Respondents indicated approximately 250 new products / services under research or development with the majority of these products / services expected to be commercialised within the next 5 years.

## THE DEPARTMENT OF INNOVATION AND INFORMATION ECONOMY

The Department of Innovation and Information Economy's Emerging Technologies team has been actively promoting Queensland BioIndustries and have introduced the following initiatives during the period of this Report:

- Established the Queensland Biotechnology Advisory Council to advise the Government on industry, social, environmental and ethical issues associated with biotechnology.
- Four "BioLink" breakfast events have been held since July 2000. The concept of the event is to link researchers with representatives of the business community and providers of capital in order to progress the commercialization of research projects.
- Negotiated an agreement with the Queensland University of Technology for the funding of a Bachelor of Biotechnology Innovation Degree to the amount of \$200,000. The degree course is designed to produce graduates with the capability of enthusiasm to build an internationally competitive biotechnology industry in Queensland. The degree will contribute to building entrepreneurial skills essential to facilitate the development of alliances, to attract venture capital and bring advanced technology products to global markets.
- Conducted commercialisation workshops for industry.
- Conducted two rural communication forums in 2000 aimed at demonstrating the Queensland Government's commitment to genuine dialogue and debate and to encourage community participation. These were held in Townsville and Emerald.
- Promoted awareness and debate on Biotechnology by sponsoring the Biofutures seminar series at the Brisbane Institute.
- Supported Queensland industry by sponsoring a BioPartnering and Investment Initiative (with Austrade). The full BioPartnering and Investment initiative comprised three stages - an educational forum hosted by US bioindustry experts held in five Australian cities; the selection of 10 biotechnology organisations to mentored and 'groomed' on the intricacies of successful international strategic partnering and investment attraction; and the introduction of these companies to US investors and prospective industry partners through a 'Road Show' visiting targeted US cities.
- Facilitated and participated in the Queensland Biotechnology Mission to the US to attend BIO2000 in Boston, USA and to network and develop strategic alliances with potential partners in the US biotechnology industry. James Cook University scientist, Dr Geoff Dobson and Townsville General Hospital Cardiothoracic Surgeon, Ben Bidstrup, both attended BIO2000 and spoke on revolutionary heart surgery procedures developed in North Queensland together with gene therapy researcher, Dr Ming Wei from the Royal Children's Hospital in Brisbane.
- Jointly coordinated a Queensland Biotechnology Mission to Japan to attend BIOJapan 2000. This was followed by two days in Osaka for a Queensland/Osaka biotechnology forum with the Japan External Trade Organisation and the local Japanese Biotechnology Association.
- Participated and supported a number of major conferences including: 15th Australasian Biotechnology Conference ABA2000 held from 2-6 July 2000; Joint Scientific Meeting and Exhibition held in Cairns from 8-13 July 2000; the Asia-Pacific International Molecular Biology Network meeting held from 24-28 September 2000 which was held in conjunction with the International Congress on Differentiation and Cell Biology; 5th International Marine Biotechnology Conference;

Overall, there was a significantly positive appraisal of the State Government's initiatives in fostering the growth of the bioindustries in Queensland. Respondents considered it important that these initiatives are supporting the industry at the early research and development and early commercialisation stage, a point at which market support is failing.

The State Government has also recently announced the establishment of a 'BioStart' fund. 'BioStart' is new initiative of the Queensland Government through the Department of Innovation and Information Economy which aims to stimulate the growth of the Queensland biotechnology industry. 'BioStart' is a cooperative venture between BioStart Pty Ltd and Start-up Australia Ventures Pty Ltd (Start-up Australia). The three year \$6 million program is designed to encourage and support young start-up companies by providing them with early stage funds to progress their research to a proof of concept level.

## TERMS OF REFERENCE

This is the 2nd Queensland biotechnology survey of biotechnology and related Health and Life Science Companies which has been performed by Ernst & Young on behalf of the Queensland Department of Innovation and Information Economy (D.I.I.E)– Emerging Technologies – BioIndustries (formally the BioIndustries Taskforce).

This Report focuses on the survey results of firms and research institutions in Queensland actively involved in biotechnology activities and benchmarking them against the October 1999 key economic indicators which established a baseline to measure the future growth of BioIndustries in Queensland. The findings of this survey are based on the input received from the participants, which has not been independently verified in any way by Ernst & Young.

The Report identifies the current and future state of the industry, by addressing the wealth creation and employment aspects of certain Bioindustry firms and research institutions in Queensland, identified by the D.I.I.E for participation in the survey. We understand that the purpose of this Report is to ascertain the industry's position in the global market and its upcoming needs and requirements.

In summary the Terms of Reference are as follows:

1. Measure the growth of Queensland's BioIndustries since 1999.
2. Measure industry confidence in business conditions over the next twelve months.
3. Identify impediments to growth requiring resolution.
4. Strategic directions for firm/research institutions over the next 1-3 and 5 years.

## SURVEY PARTICIPATION

Biotechnology is defined for the purposes of this Report as the application of science and engineering in the direct or indirect use of living organisms or parts of organisms in their natural or modified forms in an innovative manner in the production of goods and services or to improve existing processes.

It is noted that those who participated in the 1999 survey are not necessarily the same as those who responded in the 2001 survey as there were additional respondents and many new entities who participated in the 2001 survey for the first time. Furthermore, there were additional respondents as compared to the original database provided by the Department of Innovation and Information Economy which were also included in the survey results as these were participants in the 1999 Report or were recent start-ups.

For the purposes of this Report, only available 30 June 2000 financial information has been used for financial analysis unless otherwise stated. All dollar amounts, unless stated otherwise, are in Australian dollars. Surveys were conducted via face-to-face interviews, over the telephone or via email, to Chief Executive Officers/Directors/Managers of firms and research institutions.

This Report is based upon the findings presented by 59 (70%) completed survey participants across a number of different sectors. The response rate, including negative responses, represented 81% of the database provided by the Department of Innovation and Information Economy – Emerging Technologies – BioIndustries.

## Contact Details

Department of Innovation and Information Economy  
Level 10  
111 George Street  
Brisbane Qld 4000

Ph: (07) 3224 8132

Ernst & Young  
Level 5  
1 Eagle Street  
Brisbane Qld 4000

Graeme Browning  
Ph: (07) 3011 3333

Ernst & Young

[www.ey.com/au](http://www.ey.com/au)

© 2001 Ernst & Young. All Rights Reserved. Ernst & Young is a registered trademark.

Liability limited by the Accountants Scheme, approved under the Professional Standards Act 1994 (NSW).