How long did it take you to complete this questionnaire?

Include:
- The time spent reading the instructions, working on the questions, and obtaining information
- The time spent by all employees in collecting and providing this information

58

Comments
Please make any comments that would help Statistics New Zealand interpret the information that you have given.

59

Who should we contact if we need to clarify any of the responses you have given?

Name
Position
Email
Phone
Fax

I declare that this questionnaire has been completed to the best of my knowledge.

Signature
Date

60

Thank you for your time and effort

www.stats.govt.nz has the main results of all our surveys

06/2004
**Instructions**

1. **How to answer:**
   - Please write your answers with either a blue or black pen.
   - Mark your answers like this: [ ][ ][ ]
   - Keep each number or letter within the boxes provided. For example: [3][2][1]
   - Leave question and answer boxes blank where there is no response.
   - Enter zero when the answer to the question is zero.

2. **Please keep a record of the time it takes to complete this questionnaire. You are asked to record this at the end of the questionnaire.**

   To help work out your time, you can record your start time here. [ ][ ][ ][ ][ ]

   Include:  
   - The time spent reading the instructions, working on the questions and obtaining information.
   - The time spent by all employees in collecting and providing this information.

3. **Include information only for the organisation named on the front page - do NOT provide consolidated data.**

   Exclude:  
   - Subsidiary or associated businesses.
   - Accounting divisions that operate entirely outside New Zealand.

4. **Survey reference period**

   Unless otherwise specified, please provide data for the year ended **30 June 2004** OR your last accounting year that ended within the 12 months up to 30 June 2004.

---

**Recruitment**

53. **In the 12 months ending 30 June 2004, did this organisation try to recruit any staff from outside New Zealand for biotechnology research and development work?**

   - Yes [1]
   - No [3] Go to 58

54. **In the 12 months ending 30 June 2004, were any of these overseas recruitment bids successful?**

   - Yes [1]
   - No [3] Go to 56

55. **Mark all that apply. Which regions were staff recruited from?**

   - Australia
   - USA
   - Europe
   - Asia
   - Other

   If other, please specify:

56. **In the 12 months ending 30 June 2004, were any of these overseas recruitment bids unsuccessful?**

   - Yes [1]
   - No [3] Go to 58

57. **Mark all that apply. Why did this organisation’s overseas recruitment bids fail?**

   i. Inability to match overseas salary levels [5701]
   ii. Personal income taxes too high [5702]
   iii. Immigration rules and procedures [5703]
   iv. Lack of advancement opportunities [5704]
   v. Loss of professional networks [5705]
   vi. Other, please specify: [5706]
Definitions

5. What is biotechnology?
The OECD defines biotechnology as the application of science and technology to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.

The OECD provides the following list of biotechnologies, which can be used as an indicative guide to biotechnology activity.

- DNA - the coding: Genomics, pharmaco-genetics, gene probes, DNA sequencing / synthesis / amplification, genetic modification.
- Proteins and molecules - the functional blocks: Protein / peptide sequencing / synthesis, lipid / protein glycoengineering, proteomics, hormones and growth factors, cell receptors / signalling / pheromones.
- Cell and tissue culture and engineering: Cell / tissue culture, tissue engineering, hybridisation, cellular fusion, vaccine / immune stimulants, embryo manipulation.
- Process biotechnologies: Bioreactors, fermentation, bioprocessing, bioleaching, bio-pulping, bio-bleaching, biosulphurisation, bioremediation and biofiltration.
- Sub-cellular organisms: Gene therapy, viral vectors.
- Other: Bioinformatics, nanobiotechnologies, etc.

6. Development stages
The process of using biotechnology for commercial purposes can be divided into three main stages. These stages are outlined below:

- **Research / product development stage**
  
  Refers to the development of biotechnology products, processes and knowledge through research and development (R&D).
  
  This stage includes the testing of processes and products in clinical or field trials.

- **Part of the production stage**
  
  The biotechnology product, process, or knowledge is used as an input into another distinct product or process.

- **Part of the product sold stage**
  
  The biotechnology product, process or knowledge becomes part of, or the entire final product sold.

7. What is research and development (R&D)?
Research and experimental development comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge. Any activity classified as R&D is characterised by originality. Investigation is a primary objective.
Use of Biotechnologies

This section asks about the use of biotechnologies by this organisation. Please refer to 5 for the definitions of the development stages.

DNA - The Coding

8 Mark all that apply. In the last 3 years, in which development stage(s) has this organisation used the following?

<table>
<thead>
<tr>
<th>Research &amp; development</th>
<th>Part of the production process</th>
<th>Part of the product sold</th>
<th>Did not use this biotechnology</th>
</tr>
</thead>
<tbody>
<tr>
<td>i Genomics, pharmaco-genetics</td>
<td>0911 0912 0913 0914</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii Gene probes</td>
<td>0921 0922 0923 0924</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii DNA sequencing / synthesis / amplification, genetic modification</td>
<td>0931 0932 0933 0934</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Proteins and Molecules - The Functional Blocks

9 Mark all that apply. In the last 3 years, in which development stage(s) has this organisation used the following?

<table>
<thead>
<tr>
<th>Research &amp; development</th>
<th>Part of the production process</th>
<th>Part of the product sold</th>
<th>Did not use this biotechnology</th>
</tr>
</thead>
<tbody>
<tr>
<td>i Protein / peptide sequencing, synthesis</td>
<td>0911 0912 0913 0914</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii Lipid / protein glycoengineering</td>
<td>0921 0922 0923 0924</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii Proteomics</td>
<td>0931 0932 0933 0934</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv Hormones and growth factors</td>
<td>0941 0942 0943 0944</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v Cell receptors / signalling / pheromones</td>
<td>0951 0952 0953 0954</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cell and Tissue Culture, and Engineering

10 Mark all that apply. In the last 3 years, in which development stage(s) has this organisation used the following?

<table>
<thead>
<tr>
<th>Research &amp; development</th>
<th>Part of the production process</th>
<th>Part of the product sold</th>
<th>Did not use this biotechnology</th>
</tr>
</thead>
<tbody>
<tr>
<td>i Cell / tissue culture, tissue engineering</td>
<td>1011 1012 1013 1014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii Embryo manipulation</td>
<td>1021 1022 1023 1024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii Hybridization</td>
<td>1031 1032 1033 1034</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv Cellular fusion</td>
<td>1041 1042 1043 1044</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v Vaccine / immune stimulants</td>
<td>1051 1052 1053 1054</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Human Resources Supporting Biotechnology

50 Please give the number of biotechnology employees (headcount) and their full-time equivalents as at 30 June 2004.

Note: Full-time equivalents may be given to a decimal point.

Full-time equivalent (FTE): Biotechnology may be carried out by persons who work solely on biotechnology projects or by persons who devote only part of their time to biotechnology, and the balance to other activities such as testing, quality control and production engineering. To arrive at the total effort devoted to biotechnology in terms of hours worked, it is necessary to estimate the FTEs of these people working part time in biotechnology.

FTE = Number of persons who work solely on biotechnology projects + the estimate of time of persons working part-time on biotechnology.

Example calculation: If out of five scientists engaged in biotechnology work, one works solely on biotechnology projects and the remaining four devote one quarter each of their working time, the calculation would be:

FTE = 1 + 1/4 + 1/4 + 1/4 + 1/4 = 2 FTE.

Exclude:

- Staff performing indirect support to biotechnology activities
- Central finance or personnel services
- Centralised support services, eg computer departments, security, cleaning, cafeteria etc.

Biotechnology employees

i Headcount as at 30 June 2004

5001

ii FTEs during the year ended 30 June 2004

5002

iii Biotechnology positions unfilled as at 30 June 2004

5003

51 Please show the highest qualification levels of personnel working on biotechnology as at 30 June 2004.

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Headcount as at 30 June 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>i PhD</td>
<td>5101</td>
</tr>
<tr>
<td>ii Bachelor degree or equivalent and postgraduate qualifications other than PhD</td>
<td>5102</td>
</tr>
<tr>
<td>For example: Masters degrees and post graduate diploma.</td>
<td></td>
</tr>
<tr>
<td>iii Technical and trade qualifications</td>
<td>5103</td>
</tr>
<tr>
<td>For example: NZ Certificate of Engineering and NZ Trade Certificate.</td>
<td></td>
</tr>
<tr>
<td>iv Other qualifications</td>
<td>5104</td>
</tr>
</tbody>
</table>
44 Has this organisation ever had to abandon or not start a biotechnology development activity, because further work was blocked by IP rights or some knowledge protected by another organisation?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Go to 46</th>
</tr>
</thead>
</table>

45 Mark as many spaces as you need to show which of the following reasons caused the above:

- Was unable to purchase this IP
- Was unable to licence this IP
- Any other reason

46 Has this organisation ever had to abandon or not start a biotechnology development activity, because further work had been blocked by lack of access to basic research data or information?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

47 In the last 3 years has this organisation been involved in litigation relating to patent infringements?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>How many different cases?</th>
</tr>
</thead>
</table>

48 In the last 3 years has this organisation been involved in disputes relating to access to research data or information?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>How many different cases?</th>
</tr>
</thead>
</table>

### Research Publications and Conferences

49 In the 12 months ending 30 June 2004, did any staff member of this organisation:

<table>
<thead>
<tr>
<th>Research &amp; development</th>
<th>Part of the production process</th>
<th>Part of the product sold</th>
<th>Did not use this biotechnology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Go to 51</td>
<td></td>
</tr>
</tbody>
</table>

#### Process Biotechnologies

11 Mark all that apply. In the last 3 years, in which development stage(s) has this organisation used the following?

<table>
<thead>
<tr>
<th>Bioreactors</th>
<th>Fermentation, bioprocessing</th>
<th>Bioleaching, bio-pulping, bio-bleaching, biodesulpherisation</th>
<th>Bioremediation, biofiltration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Sub-Cellular Organisms

12 Mark all that apply. In the last 3 years, in which development stage(s) has this organisation used the following?

<table>
<thead>
<tr>
<th>Gene therapy</th>
<th>Viral vectors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Other

13 Mark all that apply. In the last 3 years, in which development stage(s) has this organisation used the following?

<table>
<thead>
<tr>
<th>Bioinformatics</th>
<th>Nanobiotechnologies</th>
<th>Other, please specify:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14 In the next 3 years, does this organisation intend to use any biotechnologies other than those already marked in 8 to 13?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Go to 15</th>
</tr>
</thead>
</table>

15 Does this organisation currently, or intend to in the next 3 years, use any of the biotechnologies in 8 to 14?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Go to next page</th>
</tr>
</thead>
</table>

---

**Page 12**
**Intellectual Property (IP) Rights and Patents**

**41** Mark all that apply. In the last 3 years has this organisation entered into any informal arrangements to share information with any of the following organisations?

- **i** Another business
- **ii** University
- **iii** Crown Research Institute
- **iv** Hospital
- **v** Other, please specify:

**42** Please provide the number of biotechnology-related patent applications granted to this organisation:

- **i** In the year ended 30 June 2004?
- **ii** In the last 5 years?

**43** Mark all that apply. In the last 3 years has this organisation entered into any informal arrangements to share information with any of the following organisations?

- **i** Another business
- **ii** University
- **iii** Crown Research Institute
- **iv** Hospital
- **v** Other, please specify:

---

**Area of Application**

**Human Health-Bio**

**16** Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

- **i** Diagnostics (eg immunodiagnostics, gene probes, biosensors, medical laboratory)
- **ii** Therapeutics (eg vaccines, immune stimulants, biopharmaceuticals, rational drug design, drug delivery, combinatorial chemistry)
- **iii** Gene therapy (eg gene identification, gene constructs, gene delivery, gene replacement)

**Bioinformatics**

**17** Mark the space if this organisation produced products and / or services in the following area of application.

- **i** Genomics and molecular modelling (eg DNA / RNA / protein sequencing and databases for genetic information from humans, plants, animals and micro-organisms)

**Ag-Bio**

**18** Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

- **i** Plant biotechnology (eg tissue culture, embryogenesis, genetic markers, genetic modification)
- **ii** Animal biotechnology (eg diagnostics, therapeutics, embryo transplantation, genetic markers, genetic modification)
- **iii** Biofertilizers / biopesticides / bioherbicides / biological feed additives / microbial pest control (eg bacteria, fungi, yeasts)
- **iv** Non-food applications of agricultural products

**Innovative Health and Human Nutrition**

**19** Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

- **i** Functional foods / nutriceuticals (eg probiotics, unsaturated fatty acids, unspecified food additives)
- **ii** Dairy
- **iii** Baking
- **iv** Brewing / wine production
Financial and Trade Information

Please provide financial information for total business activity and careful estimates for the percentage of biotechnology activities.

Please report data for the accounting year ended 30 June 2004 or your last accounting year that ended within the 12 months up to 30 June 2004. Do NOT include sales and operations of your subsidiaries located outside New Zealand.

1. Supply GST EXCLUSIVE values if possible.
2. Supply whole dollar values only.

32 Mark all that apply. Which of the following overseas organisations did this organisation make partnership(s) / alliance(s) with in the last 3 years?

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>USA</th>
<th>Europe</th>
<th>Asia</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>3211</td>
<td>3212</td>
<td>3213</td>
<td>3214</td>
<td>3215</td>
</tr>
<tr>
<td>Other organisations, please specify:</td>
<td>3221</td>
<td>3222</td>
<td>3223</td>
<td>3224</td>
<td>3225</td>
</tr>
</tbody>
</table>

33 What is the end-date of the accounting year you will report for?

Day
Month
Year

34 The figures given in this questionnaire:

Exclude GST 1
Include GST 2

35 What is the total income of this organisation?

$ , , ,

36 What is the percentage of total income attributable to biotechnology for this organisation?

% 

37 What is the total expenditure of this organisation?

$ , , ,

38 What is the percentage of total expenditure attributable to biotechnology for this organisation?

% 

39 What is the total value of goods, services, processes and knowledge exported by this organisation?

$ , , ,

40 What is the percentage of goods, services, processes and knowledge exported that are attributable to biotechnology for this organisation?

% 

Aquaculture

20 Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish health (eg diagnostics, therapeutics)</td>
<td>2001</td>
</tr>
<tr>
<td>Broodstock genetics (eg tracking superior traits, genetic modification)</td>
<td>2002</td>
</tr>
<tr>
<td>Bioextraction (eg carrageenan from seaweed, antifreeze proteins from fish, flavours)</td>
<td>2003</td>
</tr>
</tbody>
</table>

Mining / Energy / Petroleum / Chemicals

21 Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microbiologically enhanced petroleum / mineral recovery</td>
<td>2011</td>
</tr>
<tr>
<td>(Cleaner) Industrial processing (eg biodesulphurisation, bio-cracking, bio-recovery)</td>
<td>2012</td>
</tr>
</tbody>
</table>

Forest Products

22 Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

<table>
<thead>
<tr>
<th></th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silviculture (eg immunodiagnostics, gene probes, biosensors, medical laboratory)</td>
<td>2021</td>
</tr>
<tr>
<td>(Cleaner) Industrial processing (eg bio-pulping, bio-bleaching, biological prevention of sapstain)</td>
<td>2022</td>
</tr>
</tbody>
</table>

Environment

23 Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

<table>
<thead>
<tr>
<th></th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biofiltration (eg treatment of organic emissions to air / water)</td>
<td>2031</td>
</tr>
<tr>
<td>Bioremediation and phytoremediation (eg cleanup of sewage water and toxic waste sites using micro-organisms)</td>
<td>2032</td>
</tr>
<tr>
<td>Diagnostics (eg detection of toxic substances using bioindicators, biosensors, immunodiagnostics)</td>
<td>2033</td>
</tr>
</tbody>
</table>

Other

24 Mark all that apply. What area(s) of application best describe the products and / or services produced by this organisation?

<table>
<thead>
<tr>
<th></th>
<th>2041</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom synthesis (eg peptides, proteins, nucleotides, hormones, growth factors, biochemicals)</td>
<td>2041</td>
</tr>
<tr>
<td>Other, please specify:</td>
<td>2042</td>
</tr>
</tbody>
</table>
### New / Improved Biotechnology work

**25** In the last 3 years, did this organisation introduce any new or significantly improved biotechnology processes?

Note: Biotechnology processes are a range of techniques employed in biotechnology. Please refer to [5] for an indicative list of biotechnologies.

<table>
<thead>
<tr>
<th>Yes</th>
<th>How many processes?</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Go to 27</td>
</tr>
</tbody>
</table>