

Report on Survey of Domestic Bioindustry based on 2015

2017. 1.

MINISTRY OF TRADE, INDUSTRY & ENERGY
Korea Biotechnology Industry Organization

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I. Survey Overview

1 Survey Overview

A. Data Sources

- Division of Bio-nano, Ministry of Trade, Industry and Energy (www.motie.go.kr)
- Statistical Sources : Korea Biotechnology Industry Organization (www.koreabio.org)

B. Type of Statistics and Authorized Number

- Type of Statistics : General Survey Statistics
- Authorized Number: No. 11515
- Authorized Date : October 30th, 2003

C. Survey Period

- Survey Baseline Date: December 31, 2015
- Targeted Survey Period : January 1, 2015 ~ December 31, 2015
- Conducting Survey Period : May 27, 2016 ~ November 18, 2016

D. Scope

- Based on 'classification scheme of bioindustry (KS J 1009, recognized by Korean Agency for Technology and Standards, Ministry of Trade, Industry and Energy on January 2008)' which established the scope and definition of the domestic biotechnology and bioindustry in the survey baseline year, the scope of the survey refers to domestic businesses engaged in the activities related to biotechnology. The activities related to biotechnology refers to the following.
 - Using biotechnology as the main technology in the research and development phases, although it uses non-biotechnology in the production phase
 - Using biotechnology in the manufacturing, production and service (including research and development) phases
 - Producing machine, equipment, or plant that are used in the biotechnological process of the research and development phase or

- the production phase
- Selling the above products after importing
- ※ The survey includes companies resulted in sales through the activities stated above as well as companies pushing forward the research development in the survey baseline year.

E. Survey Targets

- The survey primarily selected bioindustry's fact-finding companies of 2014 among domestic companies falling into the range of the survey as survey targets. The survey then selected corresponding companies using the bio cluster-related companies per geography of December, 2015, other registered company data of Korea Biotechnology Industry Organization, and company yearbooks.

F. Survey Units

- The survey units refers to companies that sell products or services which went through the production process of value-adding after the assembled capital equipment or raw materials were bought under the control of the entrepreneur.
- The survey units include public enterprises (state-owned enterprises, public enterprises), public - private companies, the private companies (private enterprises, collective enterprises, partnership, joint venture, anonymous company, Co., Ltd., Co., Ltd., co-operatives).
- In case the company has more than two businesses, the survey unit included the sum of the corresponding business' results and received the responses based on the bioindustry results among the overall industrial activities.

G. Methodology and Approach

- Survey Methodology : Via mail, fax, e-mail, telephone, face-to-face interview
- Survey Approach : Researcher → Research Company → Korea

Biotechnology Industry Organization → Ministry of Trade, Industry and Energy

H. Announcement of Results

- Announcement Period : Once a year
- Form of Announcement : Publication of the Report on Fact Finding Survey of Domestic Bioindustry

2 Background and Purpose

- Ministry of Trade, Industry and Energy and Korea Biotechnology Industry Organization have been conducting fact finding survey of domestic bioindustry since 2003 to build groundwork for economic analysis, international comparison and establishment of related nurturing policies through analyzing overall status of bioindustry and its actual condition.
- The 'Report on Fact Finding Survey of Domestic Bioindustry' that started its survey conduct from May, 2016 aims to increase the successful rate as complete enumeration survey and to grasp more accurate status of domestic bioindustry.
- This survey aims to analyze bioindustry's economic feasibility through grasping sales and financial status and to establish bio-related nurturing policies through studying accurate actual condition of domestic bioindustry.
- Ministry of Trade, Industry and Energy and Korea Biotechnology Industry Organization aims to contribute to the development of domestic bioindustry through the results of this survey.

3 Methodology

Target	Company representatives or managers in Bioindustry such as Biopharmaceutical·Biochemical·Biofood·Bioenvironmental· Bioelectronics
Area	Nation-wide(17 areas including Seoul and 6 Metropolitan cities)
Methodology	Research was conducted via mail, fax, e-mail, telephone, face-to-face interview by researcher
Data-mining tool	Structured Questionnaire
Size of population	1,034 Companies (Among primarily selected 1,067 companies, 33 closed-down)
Size of valid sample	978 Companies(94.6% of the population)

* Classification of 'No Response' in last 3 years of our survey

Year	Size of population	Valid response cases	No response cases	Type of No response			
				Refusal	Not in the office	Not connected	Shutdown (during surveyed year)
2013	1,037	971 (94%)	66	13	24	18	11
2014	1,035	975 (94%)	60	15	19	20	6
2015	1,034	978 (95%)	56	16	13	22	5

4 Contents

Category	Main Contents of the Survey
Company Information	<ul style="list-style-type: none"> - Name of Company, Name of Representative - Business Registration Number, Corporate-parent (Group) Name - Phone, Establishment Date - Address - Respondent Information
General Status	<ul style="list-style-type: none"> - Capital, Capital Ratio of Net Worth - Number of Workers - Existence of exclusive business, type of company, place of business - Items in the income statement (sales, cost of goods sold, selling expenses & administrative expenses, tax, etc)
Status of Bio Industry	<ul style="list-style-type: none"> - Core business - Manpower status - R&D cost and Facility Investment cost - Cooperation with Other Organizations - Phase of Growth - Period Resulted in Sales - Product, Service, Commerce Technology (Resulted in Sales, Export·Import)

5 Terminology

A. General Status

- Selected Companies
 - ① Venture Company : Refers to companies that are selected for meeting the requirements of the venture capital investment, investment in research and development, and companies developing new technologies and technology assessment companies according to 'Act on Special Measures for the Promotion of Venture Businesses'.
 - ② INNO-BIZ : Refers to companies that are selected for Small and Medium Business Administration's 'Fostering Business for technology-innovative (INNO-BIZ) Small and Medium Businesses'.
 - ③ Listed Company : Refers to companies that meet the listing requirements which are being able to sell the issued stocks in the Kosdaq market or the stock market.
- Capital : Refers to the current amount of capital that is paid by the corporation (headquarter) until December 31, 2013.
- Capital Ratio of Net Worth : Refers to the ratio of equity capital (total amount of capital-liabilities) on the total capital (=total amount of capital+liabilities=total assets).

B. Manpower Status

- Received responses from three groups among bioindustry workers: research, production, and others including sales/administrative.
 - ① Research : Refers to research and development manpower in bioindustry.
 - ② Production : Refers to manpower engaged in production, facilities and quality management in bioindustry. (excluding manpower

in research center)

- ③ Others including sales/administrative : Refers to all manpower except research and production manpower in bioindustry.

C. R&D and Sales

- R&D Cost : Refers to company's total cost spent in research activities to develop new products or new technology for the past year of 2015. It refers to sales cost in income statement and manufacturing statement, ordinary development expense and investment cost for management, land and equipment acquisition cost related to R&D in balance sheet.
 - ① R&D Cost : Includes self R&D cost (labor costs, material costs and other expenses), commissioned research and development costs, cost for technology implementation
 - ② Facility Investment Cost related to R&D : Includes machinery, land and building acquisition cost related to R&D
- Resulting in Sales
 - ① Selling complete product that was produced in the business
 - ② Selling complete product which was outsourced by other businesses using raw material or half-finished products
 - ③ Refers to providing services and sales resulting from transfer of technology. It includes all the results of domestic sales and export activities.

D. Classification Scheme of Bioindustry and Biotechnology

1) Classification Scheme of Bioindustry

- In case of classification scheme of bioindustry, the Korean Agency for Technology and Standards established national standard KS J 1009(Bioindustry Classification Code) on January 31, 2008 by reflecting

the business results of Ministry of Trade, Industry and Energy's 'Building groundwork for standardization of biotechnology and industrial products' and the second detail topic 'Building standard classification scheme of bioindustry/biotechnology and analyzing structure of the bioindustry'.

<Overview of Bioindustry's Classification Scheme>

■ Purpose of Classification

- To clarify the scope of bioindustry
 - Defined companies that uses biotechnology in the research and development, manufacturing, production, and service phases
- To propose standardized evidences that can be used for bioindustry-related statistics and institutions without confusion
 - Creating industrial statistics such as company profits created from using biotechnology
- To build groundwork for analysis such as economic structure, industrial structure, and correlation with other industries
- To secure the connectivity with the classification scheme of international bioindustry
 - Creating groundwork for comparing and analyzing the statistical data of the international bioindustry

■ Target and Standard of Classification

- Industrial activities conducted by companies using biotechnology
- Characteristics of products (produced goods or provided service) which use biotechnology in the research and development, production and service phases
 - The function and the market of the products

■ Classification Scheme

- Consisted of 8 upper classifications and 51 middle classifications
 - The upper classifications are categorized by KS J 1009(Bioindustry Classification Code)
 - The middle classifications are categorized by goods sold using biotechnology or provided service using biotechnology. These are categorized according to their correlation with industrial activities of corresponding upper classification.

>> <Table 1-1> Classification Scheme of Bioindustry

Code	Name of Industrial Classification
1	Biopharmaceutical Industry
1010	Antibiotics
1020	Anticancer medications
1030	Vaccines
1040	Hormones
1050	Immunotherapeutics
1060	Hemotherapeutics
1070	Growth factors
1080	New therapeutics(ex. gene therapeutics, cell therapy, cloned organs, etc)
1090	Diagnostic kits
1100	Animal medications
1000	Other biopharmaceuticals
2	Biochemical Industry
2010	Biopolymers
2020	Industrial enzymes and reagents
2030	Enzymes and reagents for research
2040	Biocosmetics and home & personal care chemicals
2050	Biological agrochemicals and fertilizers
2000	Other biochemicals
3	Biofood Industry
3010	Functional health foods
3020	Amino acids
3030	Food additives
3040	Fermented foods
3050	Feed additives
3000	Other biofoods
4	Bioenvironmental Industry
4010	Microbial treatment agents
4020	Microbe-immobilized materials and equipments
4030	Bioenvironmental agents and systems
4040	Measuring apparatus for environmental pollution(service for pollution assessment)
4000	Other bioenvironmental productions and services

>> <Table 1-1> Classification Scheme of Bioindustry(Cont'd)

Code	Name of Industrial Classification
5	Bioelectronics Industry
5010	DNA chips
5020	Protein chips
5030	Cell chips
5040	Biosensors
5050	BioMEMS
5000	Other bioelectronics
6	Biochemical Industry
6010	Bioreactors
6020	Biomedical and diagnostic apparatuses
6030	Bioprocess and analysis equipments
6040	Plant and process design
6000	Other Bioprocesses and equipments
7	Bioenergy and bioresource Industry
7010	Biofuel
7020	Artificial seeds and seedlings
7030	Experimental animals
7040	Transgenic animals and plants
7000	Other bioenergy and bioresources
8	Bioassay, bioinformatics and R&D service Industry
8010	Bioinformatics services
8020	Gene analysis services
8030	Protein analysis services
8040	R&D services (ex. drug development services, etc)
8050	Biosafety and efficacy evaluation services
8060	Diagnosis and preservation services
8000	Other bioassays, bioinformatics services

※ Refer to <Appendix 1> for the explanation on classification scheme

2) Classification Scheme of Biotechnology

- In case of the classification scheme of biotechnology, it provides 13 sectors biotechnology classification code according to KS J 1009(Bioindustry Classification Code) which is recognized as national standard by the Korean Agency for Technology and Standards in January 31, 2008. This reflected the business results of Ministry of Trade, Industry and Energy's 'Building groundwork for standardization of biotechnology and industrial products' and the second detail topic 'Building standard classification scheme of bioindustry/biotechnology and analyzing structure of the bioindustry'.

<Overview of Biotechnology's Classification Scheme>

■ Purpose of Classification

- To define the scope of the domestic bioindustry
- To analyze the usage condition of biotechnology in the domestic industry

■ Target and Standard of Classification

- To establish the classification scheme of biotechnology used in industries
- To emphasize the technology used in the current bioindustry and the research development field
- To reflect the development vision of the future bioindustry and biotechnology

■ Classification Scheme

- Consisted of 2 classifications (Upper·Middle). There are 13 upper classifications and 68 middle classifications.
- The upper classification includes the technological scope of the corresponding middle classifications. It is consisted of items that can easily implement and respond to specific details of technology.
- The middle classification limits the technological scope of the upper classification. It is consisted of items that can encompass related new technologies into the list-based definitions.
- Each of the 68 middle classification has corresponding list-based definition which explains the definition and the scope of the middle classification's technology. This list-based definition is consisted of items that allows duplication among middle classifications and focuses on technological names used in industry and the research and development field.

>> <Table 1-2> Classification Scheme of Biotechnology

Code	Name of Technological Classification
A	Genetic engineering
A1	Gene manipulation
A2	Gene expression and regulation
A3	Gene application
A4	Gene therapy
A0	Genetic engineering, n.e.s.
B	Protein engineering
B1	Protein structure analysis
B2	Protein function analysis
B3	Complex protein engineering
B4	Peptide engineering
B5	Protein application
B0	Protein engineering, n.e.s.
C	Other macromolecule engineering
C1	Lipid engineering
C2	Carbohydrate engineering
C0	Macromolecule engineering, n.e.s.
D	Cell and tissue engineering
D1	Stem cell therapy
D2	Bioenvironment regulation
D3	Functional biomaterial development
D4	Cell engineering
D5	Tissue engineering
D0	Cell and tissue engineering, n.e.s.
E	Systems biology and bioinformatics
E1	Gene sequence analysis
E2	Functional genomics
E3	Proteomics
E4	Bioinformatics
E0	Systems biology and bioinformatics, n.e.s.
F	Metabolic engineering
F1	Metabolite production
F2	Applications of metabolic engineering
F3	Understanding the metabolism and metabolic pathways
F0	Metabolic engineering, n.e.s.
G	Bioprocess
G1.	Fermentation engineering
G2.	Cell culture engineering
G3.	Biotransformation
G4.	Bioseparation engineering
G5.	Industrialization
G0.	Bioprocess, n.e.s.

>> <Table 1-2> Classification Scheme of Biotechnology(Cont'd)

Code	Name of Technological Classification
H	Bioresource production and utilization
H1	Plant resource utilization technology
H2	Animal resource utilization technology
H3	Microbial resource utilization technology
H4	Insect resource utilization technology
H5	Marine/fresh water organism technology
H6	Food engineering
H7	Biomaterializing technology
H8	Biodiversity conservation
H0	Bioresource production and utilization, n.e.s.
I	Environmental biotechnology and bioenergy technology
I1	Clean technology
I2	Environmental pollution control and management technology
I3	Bioenergy technology
I0	Environmental biotechnology and bioenergy technology, n.e.s.
J	Nanobiotechnology
J1	Nano-biodevice fabrication
J2	Nanobiomaterial technology
J3	Nano drug delivery system
J4	BioNEMS(Nanoelectromechanical systems, nano-LOC(lab-on-a-chip)
J0	Nanobiotechnology, n.e.s.
K	Bioelectronics
K1	Biosensor fabrication
K2	Bioelectronic device fabrication
K3	Biochip fabrication
K4	Microfluidics
K0	Bioelectronics, n.e.s.
L	Biosafety and efficacy evaluation
L1	Safety evaluation
L2	Safety management
L3	Environmental assessment
L4	Biohazard management
L5	Efficacy evaluation
L0	Biosafety and efficacy evaluation, n.e.s.
M	Other biotechnology
M1	Combinatorial biology
M2	Drug delivery
M3	Immunotherapy technology
M0	Biotechnology, n.e.s.

※ Refer to <Appendix 1> for the explanation on classification scheme

【Special Notes on Statistical Data】

- 1) The missing values (no response, unsureness and none of the above) were excluded from the statistical calculation. (Statistical analysis was conducted based on 100% data with the missing value excluded.)
- 2) The sum of detail items and the total sum may not be identical as all the statistical values are rounded values.
- 3) This report calculates down to one place of decimals and related symbols are as the following:
「-」 : none of the above
「0.0」 : less than the unit
- 4) Any inquiries on this report should be contacted to the Bio Industry Policy unit of the Korea Biotechnology Industry Organization. (Phone : 031-628-0040, 0019)

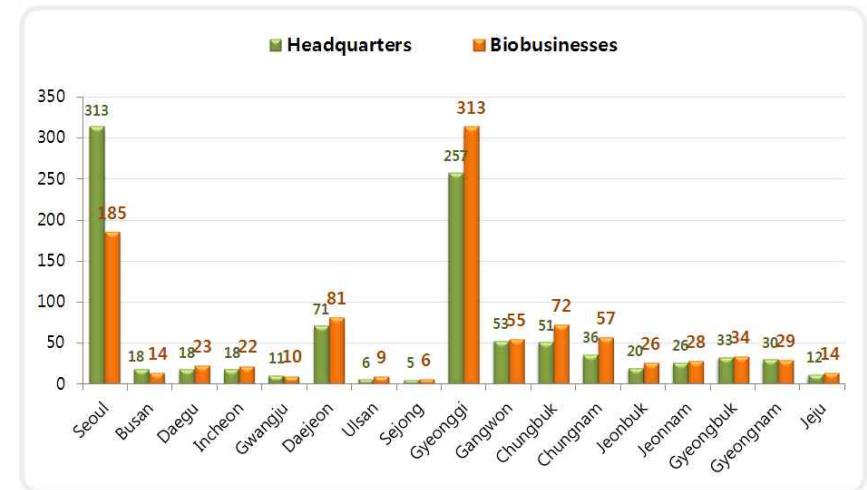
II. Key Findings

1 General Status of Bioindustry

A. Bioindustry's Distribution per Place

- Headquarters and biobusinesses of domestic bioindustry are mostly located in Seoul and Gyeonggi province. There are 313 headquarters in Seoul, and 313 biobusinesses in Gyeonggi.

<Figure 2-1> Bioindustry's Distribution per Place (Unit : number of companies)



* Place of biobusinesses were analyzed according to the following order:
factory > research center > headquarter.

<Table 2-1> Bioindustry's Distribution per Place (Unit : number of companies)

Industrial Category	Total	Seoul	Busan	Daegu	In cheon	Gwang ju	Dae jeon	Ulsan	Sejong
Total	978	185	14	23	22	10	81	9	6
Biopharmaceutical industry	330	84	3	7	9	1	19	1	1
Biochemical industry	206	24	2	3	4	2	34	3	3
Biofood industry	197	22	7	4	4	2	7	-	2
Bioenvironmental industry	76	5	1	6	3	2	4	2	-
Bioelectronics industry	22	7	-	1	1	1	2	-	-
Bioprocess and equipment industry	71	20	-	1	1	1	7	-	-
Bioenergy and bioresource industry	26	1	1	-	-	-	2	3	-
Bioassay, bioinformatics and R&D service industry	50	22	-	1	-	1	6	-	-

Industrial Category	Gyeon ggi	Gang won	Chung buk	Chung nam	Jeonb uk	Jeonna m	Gyeon gbuk	Gyeon gnam	Jeju
Total	313	55	72	57	26	28	34	29	14
Biopharmaceutical industry	137	11	28	18	5	1	2	2	1
Biochemical industry	48	13	14	14	5	10	15	8	4
Biofood industry	45	18	19	18	8	10	10	14	7
Bioenvironmental industry	25	8	5	1	4	3	3	4	-
Bioelectronics industry	5	4	-	1	-	-	-	-	-
Bioprocess and equipment industry	31	1	1	4	-	2	2	-	-
Bioenergy and bioresource industry	8	-	3	-	3	2	1	1	1
Bioassay, bioinformatics and R&D service industry	14	-	2	1	1	-	1	-	1

* The result analyzed the results of 1 core business that was selected for each company.

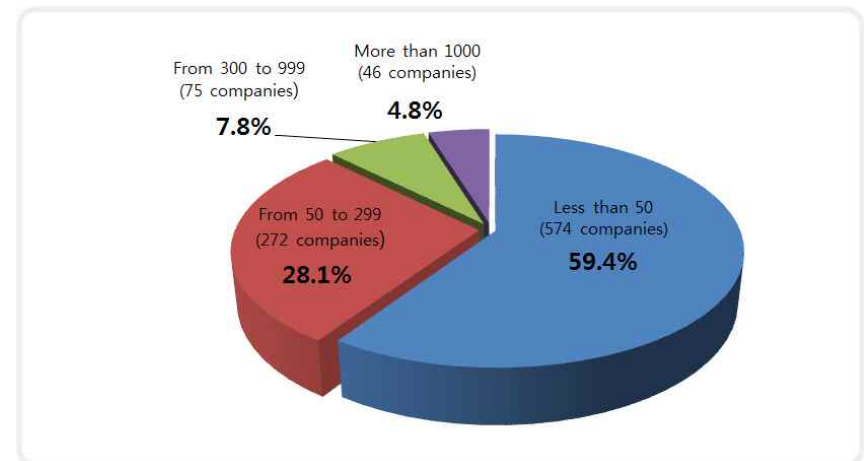
- TOP3 provinces for domestic bioindustry's businesses are as the following:
 Biopharmaceutical Industry: Gyeonggi 41.5% > Seoul 25.5% > Chungbuk 8.5%
 Biochemical Industry : Gyeonggi 23.3% > Daejeon 16.5% > Seoul 11.7%
 Biofood Industry : Gyeonggi 22.8% > Seoul 11.2% > Chungbuk 9.6%

Bioenvironmental Industry : Gyeonggi 32.9% > Gangwon 10.5% > Seoul 6.6%
 Bioelectronics Industry : Seoul 31.8% > Gyeonggi 22.7% > Gangwon 18.2%
 Bioprocess and equipment industry : Gyeonggi 43.7% > Seoul 28.2% > Dajeon 9.9%
 Bioenergy and bioresource Industry : Gyeonggi 30.8% > Ulsan, Chungbuk, Jeonbuk 11.5%
 Bioassay, bioinformatics and R&D service Industry : Seoul 44.0% > Gyeonggi 28.0% > Daejeon 12.0%

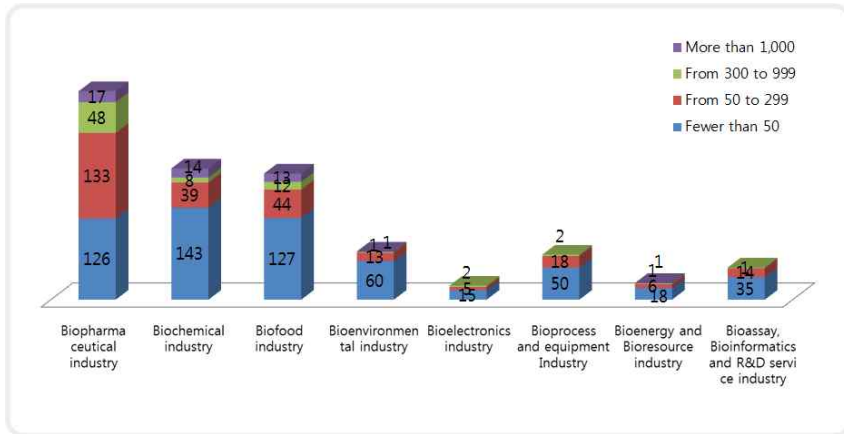
B. Bioindustry's Distribution per Size of Workers

- There are 574 companies (59.4%) that belongs to 'less than 1~50 workers' among total size of workers. (Excluded 11 no response cases)
- There are 46 companies (4.8%) that have more than 1,000 workers.

<Figure 2-2> Bioindustry's Distribution per Size of Workers



<Figure 2-3> Bioindustry's Size of Workers (Unit : number of companies)

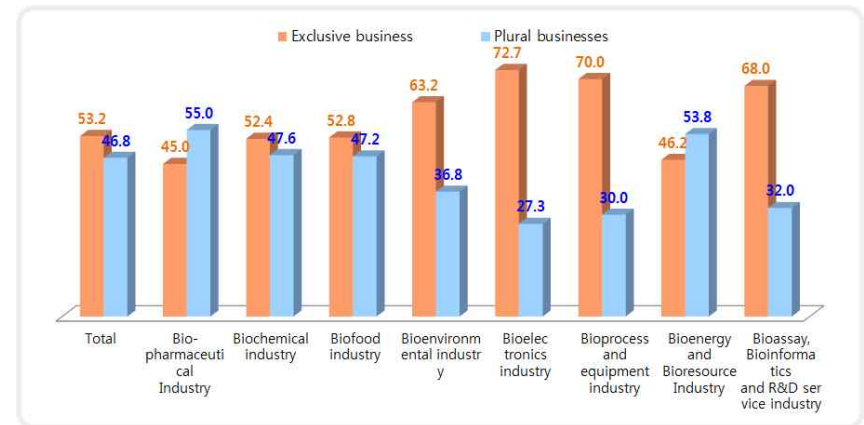


* Companies that did not have information on the size of workers were excluded from the statistical data.

C. Bioindustry's Distribution on the Existence of Other Businesses

- Bioindustry's existence of other businesses refers to the existence of factories, research centers or stores in other location.
- Companies that do not have factories, research center or stores in other location are categorized as 'exclusive business'. Companies that have factories, research centers or stores in other location are categorized as 'plural businesses'.
- Among 974 bioindustry companies, 518 companies (53.2%) are 'exclusive business' and 456 companies (46.8%) are 'plural businesses' according to the survey.

<Figure 2-4> Bioindustry's Existence of Other Businesses (Unit : %)



* Excluded samples that could not classify their operation status as either exclusive or plural

D. Bioindustry's Financial Analysis

- The total capital of bioindustry is surveyed as 15.3 billion won and the ratio of net worth is 54%.
- Companies in biochemical industry had higher average amount of capital reaching 35.4 billion won. Companies in biopharmaceutical, bioelectronics industry had higher value compared to other bioindustries with ratio of net worth reaching 62%, 58% each.

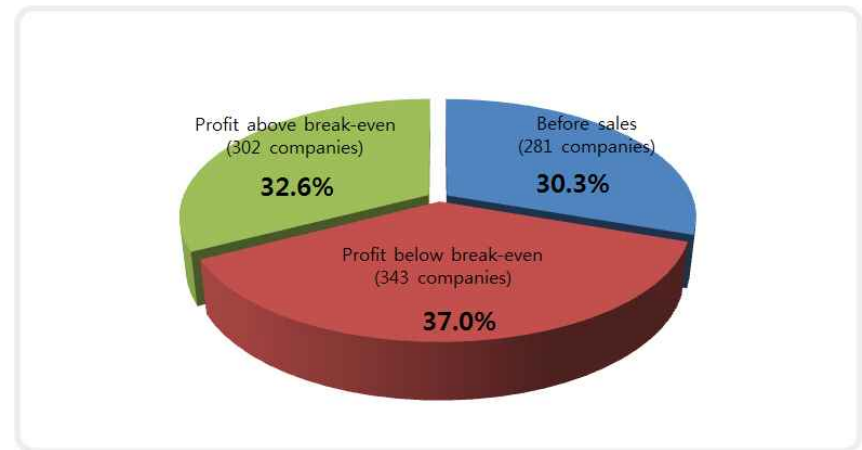
<Table 2-2> Biotechnology Industry's Financial Standing Analysis by Category
(Unit : %, million Won)

Industrial Category	No. of companies	Capital			Ratio of Net worth		
		Minimum	Maximum	Average	Minimum	Maximum	Average
Total	978	5	1,500,000	15,325	-432	1,782	54
Biopharmaceutical industry	330	15	815,317	13,843	-220	1,782	62
Biochemical industry	206	30	1,500,000	35,436	-432	126	48
Biofood industry	197	10	516,625	12,661	-194	301	51
Bioenvironmental industry	76	30	10,846	1,379	19	99	55
Bioelectronics industry	22	10	7,305	2,828	24	91	58
Bioprocess and equipment industry	71	5	41,277	2,277	7	96	51
Bioenergy and bioresource industry	26	53	167,456	14,517	-84	98	38
Bioassay, bioinformatics and R&D service industry	50	5	13,908	2,029	-103	100	51

E. Type of Biobusiness Being Promoted in Bioindustry

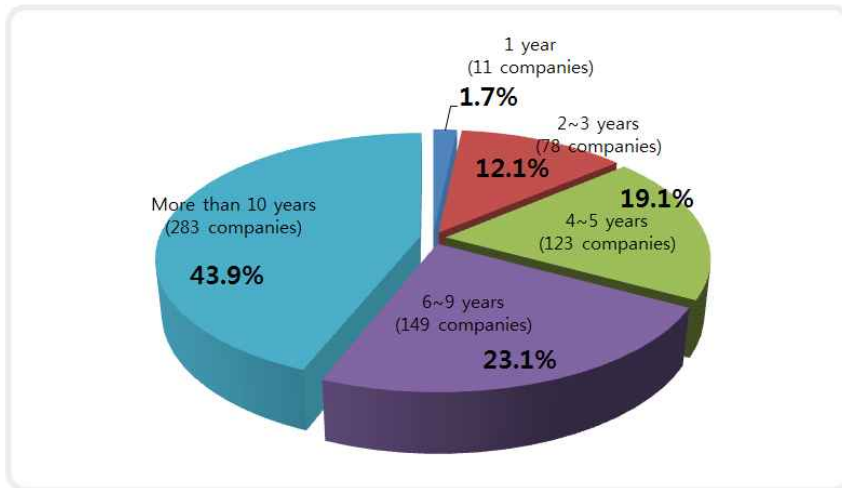
- The result for type of forwarded biobusiness includes responses from 926 companies out of 978 total participants, of which 52 were non-responses.
- Among 926 companies, 281 companies (30.3%) belonged to the phase of 'before sales' in 2015, and among 645 companies that resulted in sales, 343 companies which are almost half the number belonged to 'below BEP'.

<Figure 2-5> Type of Biobusiness Being Promoted in Bioindustry



- Among 644 companies that resulted in sales in 2015, 11 companies (1.7%) had their first sales in 2015. (Excluded 1 no response case)
- There are 283 companies (43.9%) that resulted in sales for more than 10 years.

<Figure 2-6> Bioindustry's Sales Period



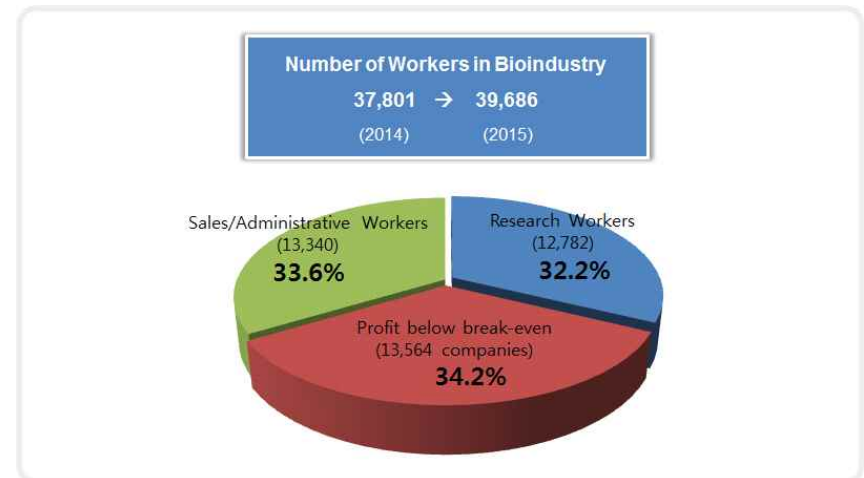
2 Manpower Status of Bioindustry

A. Manpower Status of 2015

1) Manpower Status per Category

- Among 978 domestic bioindustry companies in 2015, there was an increase of 1,885 workers compared to 2014, reaching 39,686 and there are average of 40.6 workers per company.
- Manpower of bioindustry is consisted of 12,782 research workers (32.2%), 13,567 production workers (34.2%), 13,340 sales/administrative workers (33.6%).

<Figure 2-7> 2015 Bioindustry's Distribution of Manpower



<Table 2-3> 2015 Bioindustry's Manpower Distribution

(Unit : number of companies, workers, %)

Industrial Category		No. of Companies	Research workers	Production workers	Sales/administrative workers	Total	Distribution Ratio
Total	No. of Employees	978	12,782	13,564	13,340	39,686	100.0
	Distribution Ratio	100.0	32.2	34.2	33.6	100.0	
Biopharmaceutical industry		330	6,157	7,147	7,514	20,818	52.5
Biochemical industry		206	2,168	1,453	1,394	5,015	12.6
Biofood industry		197	1,659	3,029	1,831	6,519	16.4
Bioenvironmental industry		76	357	369	488	1,214	3.1
Bioelectronics industry		22	303	576	306	1,185	3.0
Bioprocess and equipment industry		71	428	510	576	1,514	3.8
Bioenergy and bioresource industry		26	371	409	369	1,149	2.9
Bioassay, bioinformatics and R&D service industry		50	1,339	71	862	2,272	5.7

<Figure 2-8> Bioindustry's Manpower Proportion of 2015

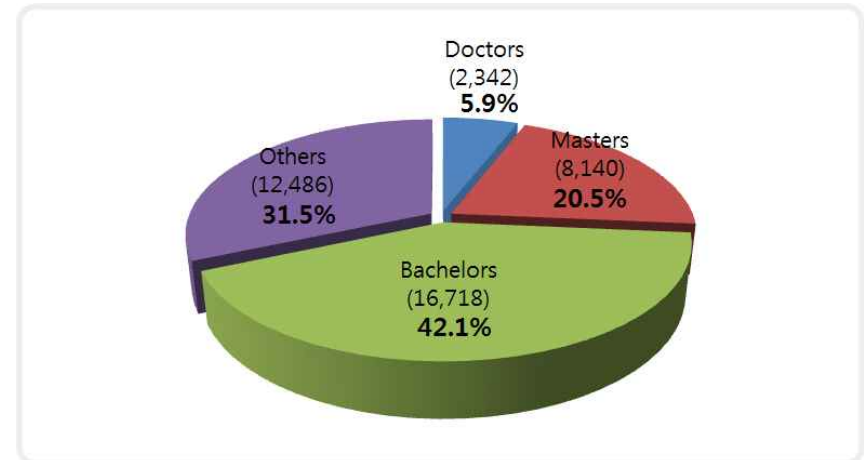
(Unit : %)



2) Manpower Status per Academic Degree

- Among bioindustry manpower in 2015, workers with bachelor's degree were the largest in number, reaching 16,718 people (42.1%). Workers with master's degree ranked second with 8,140 workers (20.5%), and workers with doctor's degree the last with 2,342 workers (5.9%).

<Figure 2-9> Bioindustry's Academic Degree Proportion of Workers of 2015



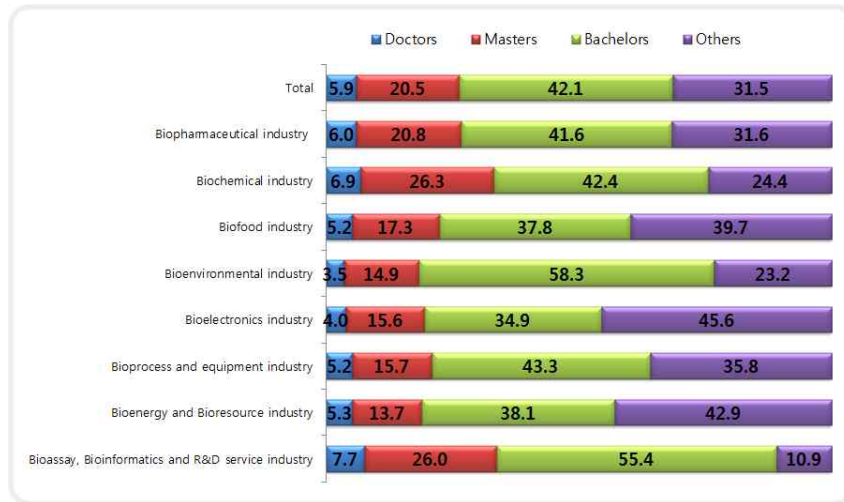
<Table 2-4> 2015 Bioindustry's Distribution of Academic Degree

(Unit : number of people, %)

Industrial Category		Doctor	Master	Bachelor	Others	Total	Distribution Ratio
Total	No. of Employees	2,342	8,140	16,718	12,486	39,686	100.0
	Distribution Ratio	5.9	20.5	42.1	31.5	100.0	
Biopharmaceutical industry		1252	4,336	8,658	6,572	20,818	52.5
Biochemical industry		345	1,321	2,126	1,223	5,015	12.6
Biofood industry		341	1,131	2,461	2,586	6,519	16.4
Bioenvironmental industry		43	181	708	282	1,214	3.1
Bioelectronics industry		47	185	413	540	1,185	3.0
Bioprocess and equipment industry		78	238	656	542	1,514	3.8
Bioenergy and bioresource industry		61	157	438	493	1,149	2.9
Bioassay, bioinformatics and R&D service industry		175	591	1,258	248	2,272	5.7

○ Portion of elite manpower such as workers with masters or doctors degree is relatively high in bioassay, bioinformatics and R&D service industry(33.7%) and in biochemical industry(33.2%).

<Figure 2-10> Bioindustry's Academic Degree Proportion of 2015 (Unit : %)



3) Manpower Distribution by Area

○ Gyeonggi area held 34.4% of total bioindustry's manpower in 2015, which account for 13,634 workers in numbers. Followed areas that ranked high of possession of bioindustry's manpower are Chungbuk (5,626 people), Seoul(4,745 people), Incheon(3,546 people).

< Talbe 2-5 > 2015 Bioindustry's Manpower Distribution by Area

(Unit : number of people, %)

Area	Doctor	Master	Bachelor	Others	Total	Distribution Ratio
Total	2,342	8,140	16,718	12,486	39,686	100.0
	No. of Employees					
	Distribution Ratio	5.9	20.5	42.1	31.5	100.0
Seoul	376	1106	2,568	695	4,745	12.0
Busan	14	37	57	62	170	0.4
Daegu	18	65	231	249	563	1.4
Incheon	151	812	1,317	1266	3,546	8.9
Gwangju	3	19	36	5	63	0.2
Daejeon	306	640	874	366	2,186	5.5
Ulsan	15	85	237	204	541	1.4
Sejong	11	69	213	136	429	1.1
Gyeonggi	772	3,007	5,061	4,794	13,634	34.4
Gangwon	133	349	935	903	2,320	5.8
Chungbuk	218	988	2,733	1,687	5,626	14.2
Chungnam	95	327	677	807	1,906	4.8
Jeonbuk	122	419	1,087	699	2,327	5.9
Jeonnam	31	53	184	134	402	1.0
Gyeongbuk	27	54	187	149	417	1.1
Gyeongnam	24	82	252	257	615	1.5
Jeju	26	28	69	73	196	0.5

B. Recent Trend of Bioindustry Manpower Status

1) 2013~2015 Bioindustry's trend of manpower status

① Bioindustry's Trend of manpower status

○ The manpower of bioindustry in 2015 had an increase of 1,885 workers(5.0%) compared to 2014, reaching 39,686 workers.

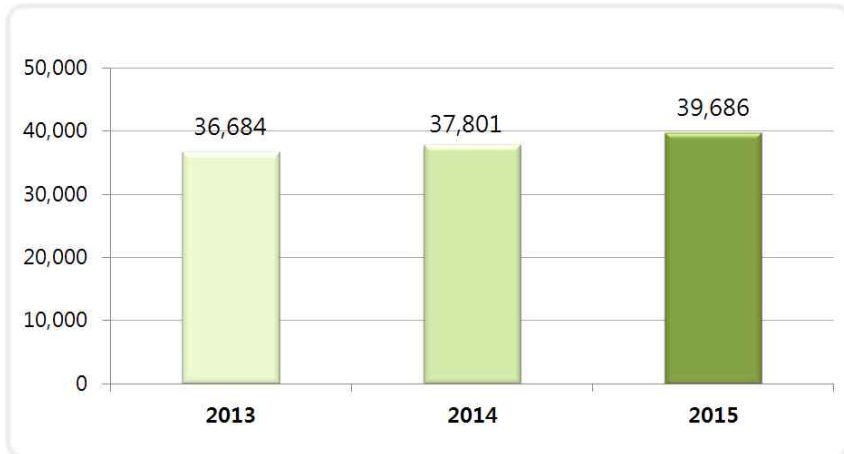
<Table 2-6> 2013~2015 Bioindustry's Change in Manpower

(Unit : number of people, %)

Classification	2013	2014	2015	Annual Average Rate of change
No. of Employees	36,684	37,801	39,686	4.0
Rate of Change	-2.4	3.0	5.0	

<Figure 2-11> 2013~2015 Bioindustry's Trend of Manpower

(Unit : number of people)



② Bioindustry's Trend in Academic Degree of Manpower

○ Compared to 2014, the proportion of bioindustry workers with bachelor's degree in 2015 increased slightly from 41.4% to 42.1% (0.7%p).

<Table 2-7> 2013~2015 Bioindustry's Trend in Academic Degree of

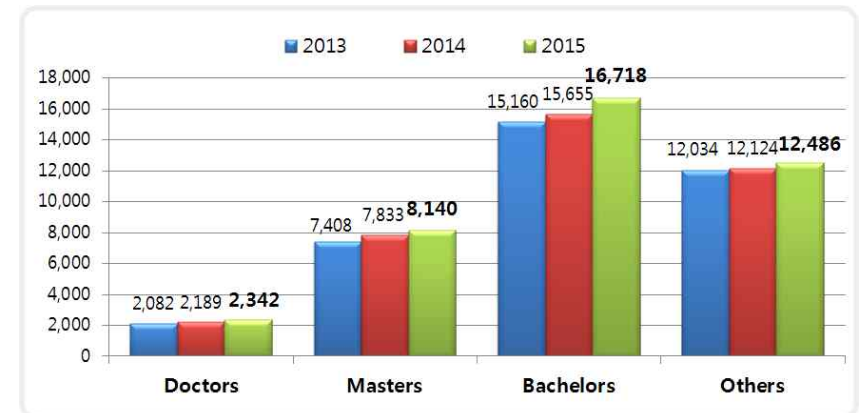
Manpower

(Unit : number of people, %)

Degree	2013		2014		2015		Variation from the year before	
	No. of Employees	Distribution Ratio	No. of Employees	Distribution Ratio	No. of Employees	Distribution Ratio	No. of Employees	Rate of Change
Total	36,684	100.0	37,801	100.0	39,686	100.0	1,885	5.0
Doctor	2,082	5.7	2,189	5.8	2,342	5.9	153	7.0
Master	7,408	20.2	7,833	20.7	8,140	20.5	307	3.9
Bachelor	15,160	41.3	15,655	41.4	16,718	42.1	1,063	6.8
Others	12,034	32.8	12,124	32.1	12,486	31.5	362	3.0

<Figure 2-12> 2013~2015 Bioindustry's Trend in Academic Degree of Manpower

(Unit : number of people)



2) 2011~2015 Bioindustry's Trend in Academic Degree of Manpower

① Bioindustry's Trend of Manpower status

○ Since 2013, Bioindustry Manpower continued to increase.

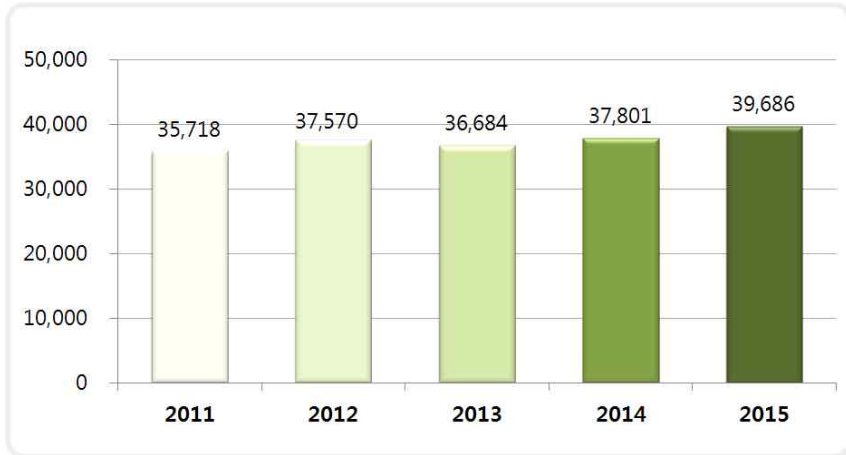
<Table 2-8> 2011~2015 Bioindustry's Change in Manpower (%)

(Unit : number of people, %)

Classification	2011	2012	2013	2014	2015	Annual Average Rate of Change
	No. of Employees	35,718	37,570	36,684	37,801	
Rate of Change	11.1	5.2	-2.4	3.0	5.0	

<Figure 2-13> 2011~2015 Bioindustry's Trend of Manpower

(Unit : number of people)



② Bioindustry's Trend in Academic Degree of Manpower

○ In 2011 to 2015, number of employees with either bechelor, master, and doctor degree continued to increase.

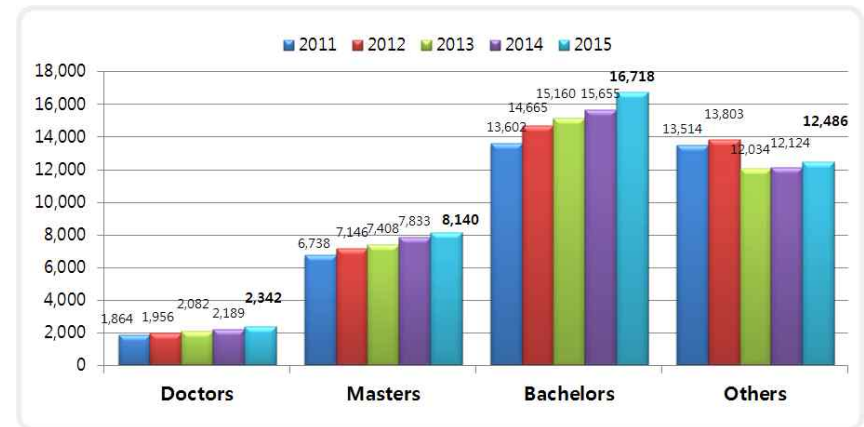
<Table 2-9> 2011 ~ 2015 Bioindustry's Trend in Academic Degree of Manpower

(Unit : number of people, %)

Degree	2011		2012		2013		2014		2015		Variation from the year before	
	No. of Employees	Distribution Ratio	No. of Employees	Distribution Ratio	No. of Employees	Distribution Ratio	No. of Employees	Distribution Ratio	No. of Employees	Distribution Ratio	No. of Employees	Rate of Change
Total	35,718	100.0	37,570	100.0	36,684	100.0	37,801	100.0	39,686	100.0	1,885	5.0
Doctor	1,864	5.2	1,956	5.2	2,082	5.7	2,189	5.8	2,342	5.9	153	7.0
Master	6,738	18.9	7,146	19.0	7,408	20.2	7,833	20.7	8,140	20.5	307	3.9
Bachelor	13,602	38.1	14,665	39.0	15,160	41.3	15,655	41.4	16,718	42.1	1,063	6.8
Others	13,514	37.8	13,803	36.7	12,034	32.8	12,124	32.1	12,486	31.5	362	3.0

<Figure 2-14> 2011~2015 Bioindustry's Trend in Academic Degree of Manpower

(Unit : number of people)

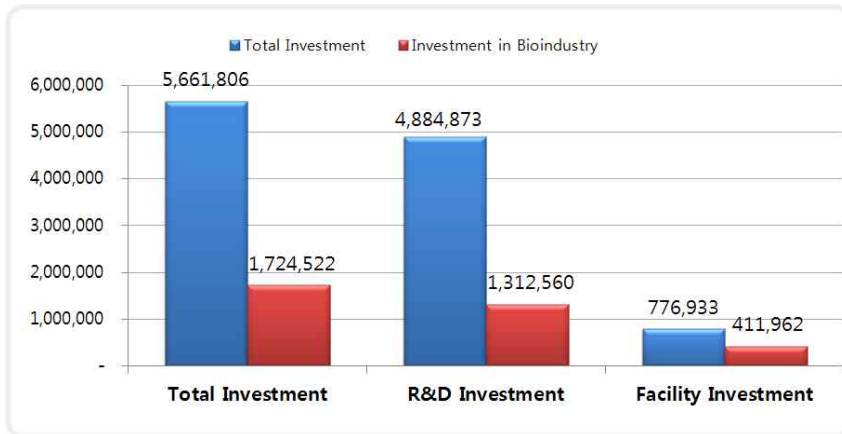


3 Investment Status of Bioindustry

A. Bioindustry's Investment Status of 2015

- The total amount of investment bioindustry companies made for the past year of 2015 reached 5 trillion and 661.8 billion won, and the investment cost on bioindustry turned out to be 30.5% of the total investment fee reaching 1 trillion and 724.5 billion won.
- The R&D cost in bioindustry turned out to be 26.9% of the total R&D cost reaching 1 trillion and 312.6 billion won, and the facility investment cost in bioindustry took 53.0% of the total facility investment cost reaching 412.0 billion won.

<Figure 2-15> 2015 Total Investment cost and Investment in Bioindustry
(Unit: million Won)



- Among bioindustries, the total investment was highest in biopharmaceutical industry reaching 1 trillion and 349.9 billion won(78.3%) and then the following highest industries were biofood industry reaching 99.7 billion won(5.8%) and biochemical industry reaching 136.6 billion won(7.9%). These three core bioindustries took 92.0% of bioindustry's the total investment cost.
- Among bioindustries, the total R&D cost was highest in biopharmaceutical industry reaching 996.4 billion won(75.9%) and then the following highest industries were biochemical industry reaching 118.2 billion won(9.0%) and biofood industry reaching 86.5 billion won(6.6%). These three core bioindustries took 91.5% of bioindustry's the total R&D cost.
- Among bioindustry companies, the average amount of R&D cost was highest in biopharmaceutical industry reaching 3.0 billion won and then the following highest industries were bioelectronics industry with 1.0 billion won, bioenergy and bioresource, bioassay, bioinformatics and R&D service industry with 0.7 billion won.
- Among bioindustries, the total facility investment cost was highest in biopharmaceutical industry reaching 353.5 billion won(85.8%) and then the following highest industries were biofood industry reaching 13.2 billion won(3.2%) and biochemical industry reaching 18.5 billion won(4.5%). These three bioindustries took 93.5% of bioindustry's the total facility investment cost.
- Among bioindustry companies, the average amount of facility investment cost was highest in biopharmaceutical industry reaching 1.1 billion won and then the following highest industries were bioassay, bioinformatics and R&D service industry with 0.4 billion won, Bioprocess and equipment industry , Bioenergy and bioresource industry with 0.2 billion won.

<Table 2-10> 2015 Bioindustry's Size of Investment (Unit : number of companies, million Won)

Industrial Category	No. of companies	R&D Investment		Facility Investment		Total Investment	
		Total	Average	Total	Average	Total	Average
Total	978	1,312,560	1,342.1	411,962	421.2	1,724,522	1,763.3
Biopharmaceutical industry	330	996,423	3,019.5	353,457	1,071.1	1,349,880	4,090.5
Biochemical industry	206	118,190	573.7	18,457	89.6	136,647	663.3
Biofood industry	197	86,500	439.1	13,219	67.1	99,719	506.2
Bioenvironmental industry	76	9,183	120.8	1,793	23.6	10,976	144.4
Bioelectronics industry	22	22,764	1,034.7	1,087	49.4	23,851	1,084.1
Bioprocess and equipment industry	71	21,038	296.3	1,553	21.9	22,591	318.2
Bioenergy and bioresource industry	26	21,064	810.2	4,056	156.0	25,120	966.2
Bioassay, bioinformatics and R&D service industry	50	37,398	748.0	18,340	366.8	55,738	1,114.8

- Size of overall R&D investment was highest in Incheon and Gyeonggi area, while that of facility investment was highest in Incheon area.
- Average size of R&D investment was highest in Incheon area where it reached 16.3 billion won, while that of facility investment was highest in Incheon to reach 10.4 billion won.

< Table 2-11 > 2015 Bioindustry's Size of Investment by Area

(Unit : number of companies, million Won)

Area	No. of companies	R&D Investment		Facility Investment		Total Investment	
		Total	Average	Total	Average	Total	Average
Total	978	1,312,560	1,342.1	411,962	421.2	1,724,522	1,763.3
Seoul	185	98,379	531.8	11,184	60.5	109,563	592.2
Busan	14	1,639	117.1	515	36.8	2,154	153.9
Daegu	23	2,988	129.9	337	14.7	3,325	144.6
Incheon	22	359,530	16,342.3	228,994	10408.8	588,524	26,751.1
Gwangju	10	503	50.3	160	16.0	663	66.3
Daejeon	81	128,402	1,585.2	28,605	353.1	157,007	1,938.4
Ulsan	9	33,745	3,749.4	12,917	1435.2	46,662	5,184.7
Sejong	6	22,667	3,777.8	1,700	283.3	24,367	4,061.2
Gyeonggi	313	360,156	1,150.7	58,870	188.1	419,026	1,338.7
Gangwon	55	31,618	574.9	9,547	173.6	41,165	748.5
Chungbuk	72	174,956	2,429.9	42,705	593.1	217,661	3,023.1
Chungnam	57	21,642	379.7	8,401	147.4	30,043	527.1
Jeonbuk	26	63,405	2,438.7	2,570	98.8	65,975	2,537.5
Jeonnam	28	2,036	72.7	3,238	115.6	5,274	188.4
Gyeongbuk	34	3,799	111.7	840	24.7	4,639	136.4
Gyeongnam	29	4,480	154.5	505	17.4	4,985	171.9
Jeju	14	2,615	186.8	874	62.4	3,489	249.2

B. Recent Trend of Investment Status

1) 2013~2015 Bioindustry's Trend of Investment

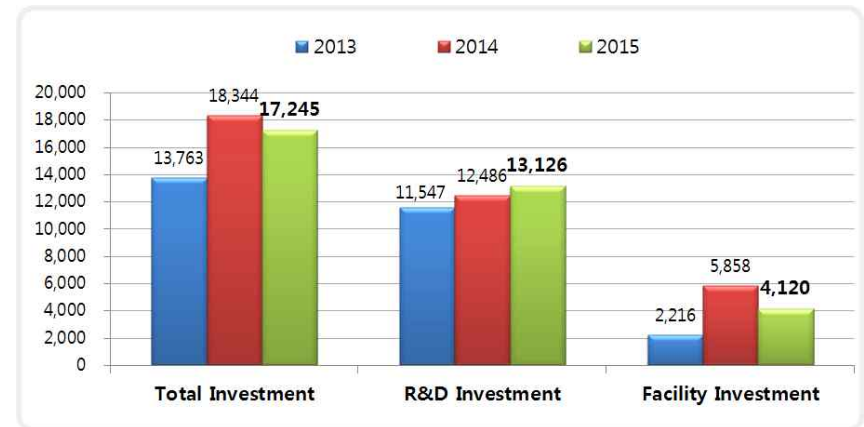
- The total investment cost in bioindustry decreased from 1 trillion and 834.4 billion won in 2014 to 1 trillion and 724.5 billion won in 2015.

<Table 2-12> 2013~2015 Bioindustry's Trend of Investment

(Unit : one hundred million Won, %)

Classification		2013	2014	2015	Annual Average Rate of Change
Total Investment	Amount	13,763	18,344	17,245	
	Rate of Change	-11.2	33.3	-6.0	
R&D Investment	Amount	11,547	12,486	13,126	36.3
	Rate of Change	14.6	8.1	5.1	
Facility Investment	Amount	2,216	5,858	4,120	-39.4
	Rate of Change	-59.1	164.3	-29.7	

<Figure 2-16> 2013~2015 Bioindustry Investment Trend (Unit : one hundred million Won)



- In comparison to 2014, overall size of investment for 2015 increased the most in bioassay, bioinformatics and R&D service industry and biochemical industry by 25.4%, 22.8% each; however, its size decreased by 9.4% biopharmaceutical industry.

<Table 2-13> 2013~2015 Bioindustry's Trend in Overall Size of Investment

(Unit : million Won, %)

Industrial Category	2013		2014		2015		Variation from the year before	Annual Average Rate of Change
	Investment Amount	Distribution Ratio	Investment Amount	Distribution Ratio	Investment Amount	Distribution Ratio		
Total	1,376,336	100.0	1,834,358	100.0	1,724,522	100.0	-6.0	11.9
Biopharmaceutical industry	1,020,871	74.2	1,490,557	81.3	1,349,880	78.3	-9.4	15.0
Biochemical industry	110,416	8.0	111,254	6.1	136,647	7.9	22.8	11.2
Biofood industry	123,621	9.0	109,002	5.9	99,719	5.8	-8.5	-10.2
Bioenvironmental industry	12,596	0.9	11,254	0.6	10,976	0.6	-2.5	-6.7
Bioelectronics industry	22,579	1.6	24,199	1.3	23,851	1.4	-1.4	2.8
Bioprocess and equipment industry	20,038	1.5	21,025	1.1	22,591	1.3	7.4	6.2
Bioenergy and bioresource industry	22,938	1.7	22,635	1.2	25,120	1.5	11.0	4.6
Bioassay, bioinformatics and R&D service industry	43,277	3.1	44,432	2.4	55,738	3.2	25.4	13.5

- In comparison to 2014, R&D cost for 2015 increased by 21.6% in biochemical industry, 6.3% in bioprocess and equipment industry, 5.3% in biopharmaceutical industry. However, R&D cost decreased the most in 3 industry areas such as biofood industry (by 9.6%), bioenvironmental industry (by 3.8%), and bioelectronics industry (by 0.5%).

- Bioassay, bioinformatics and R&D service industry showed the highest increase in the facility investment cost of 2015 compared to 2014, reaching 141.6%. Bioenergy and bioresource industry also showed a high rate with 69.8% increase. However, facility investment cost decreased the most in 3 industry areas such as biopharmaceutical industry (by 35.0%), bioassay, bioelectronics industry (by 18.3%), biofood industry (by 0.7%).

<Table 2-14> 2013~2015 Bioindustry's Trend of R&D and Facility Investment Cost

(Unit : million Won, %)

Industrial Category	2013		2014		2015		Variation from the year before		Annual Average Rate of Change	
	R&D	Facility	R&D	Facility	R&D	Facility	R&D	Facility	R&D	Facility
Total	1,154,719	221,617	1,248,594	585,764	1,312,560	411,962	5.1	-29.7	6.6	36.3
Biopharmaceutical industry	847,459	173,412	946,385	544,172	996,423	353,457	5.3	-35.0	8.4	42.8
Biochemical industry	95,247	15,169	97,220	14,034	118,190	18,457	21.6	31.5	11.4	10.3
Biofood industry	108,190	15,431	95,696	13,306	86,500	13,219	-9.6	-0.7	-10.6	-7.4
Bioenvironmental industry	10,717	1,879	9,550	1,704	9,183	1,793	-3.8	5.2	-7.4	-2.3
Bioelectronics industry	20,769	1,810	22,868	1,331	22,764	1,087	-0.5	-18.3	4.7	-22.5
Bioprocess and equipment industry	18,584	1,454	19,788	1,237	21,038	1,553	6.3	25.5	6.4	3.3
Bioenergy and bioresource industry	20,798	2,140	20,246	2,389	21,064	4,056	4.0	69.8	0.6	37.7
Bioassay, bioinformatics and R&D service industry	32,955	10,322	36,841	7,591	37,398	18,340	1.5	141.6	6.5	33.3

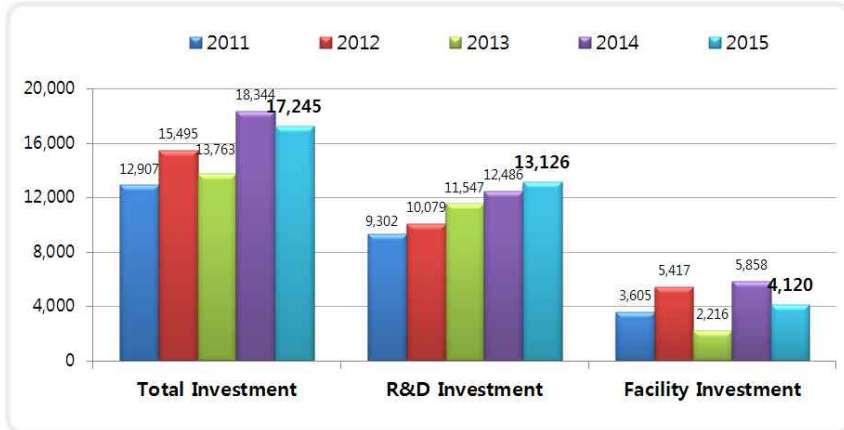
2) 2011~2015 Bioindustry's Trend of Investment

- Total size of investment in bioindustry increased compared to its previous year in 2011 and 2012, while it decreased in 2013 by 11.2%, but increased in 2014 by 33.3%.

<Table 2-15> 2011~2015 Bioindustry's Trend of Investment
(Unit : one hundred million Won, %)

Classification		2011	2012	2013	2014	2015	Annual Average Rate of Change
Total Investment	Amount	12,907	15,495	13,763	18,344	17,245	7.5
	Rate of Change	27.4	20.1	-11.2	33.3	-6.0	
R&D Investment	Amount	9,302	10,079	11,547	12,486	13,126	9.0
	Rate of Change	21	8.4	14.6	8.1	5.1	
Facility Investment	Amount	3,605	5,417	2,216	5,858	4,120	3.4
	Rate of Change	47.2	50.3	-59.1	164.3	-29.7	

<Figure 2-17> 2011~2015 Bioindustry Investment Trend (Unit : one hundred million Won)



- For investment in bioindustry since 2011, the investment in biopharmaceutical industry accounts for approx. 70% or more of total investment and the proportion has been increasing gradually to 78.3% as of 2015.

- However, investment size portion of biochemical industry and biofood industry within total industry, of which is 2nd and 3rd largest in volume, is in decreasing trend.

<Table 2-16> 2011~2015 Bioindustry's Trend in Overall Size of Investment
(Unit : million Won, %)

Industrial Category	2011		2012		2013		2014		2015		Variation from the year before	Annual Average Rate of Change
	Investment Amount	Distribution Ratio	Investment Amount	Distribution Ratio	Investment Amount	Distribution Ratio	Investment Amount	Distribution Ratio	Investment Amount	Distribution Ratio		
Total	1,290,750	100.0	1,549,548	100.0	1,376,336	100.0	1,834,358	100.0	1,724,522	100.0	-6.0	7.5
Biopharmaceutical industry	903,350	70.0	1,142,819	73.8	1,020,871	74.2	1,490,557	81.3	1,349,880	78.3	-9.4	10.6
Biochemical industry	120,875	9.4	134,810	8.7	110,416	8.0	111,254	6.1	136,647	7.9	22.8	3.1
Biofood industry	144,887	11.2	139,888	9.0	123,621	9.0	109,002	5.9	99,719	5.8	-8.5	-8.9
Bioenvironmental industry	14,358	1.1	15,197	1.0	12,596	0.9	11,254	0.6	10,976	0.6	-2.5	-6.5
Bioelectronics industry	20,298	1.6	22,563	1.5	22,579	1.6	24,199	1.3	23,851	1.4	-1.4	4.1
Bioprocess and equipment industry	22,634	1.8	23,210	1.5	20,038	1.5	21,025	1.1	22,591	1.3	7.4	0.0
Bioenergy and bioresource industry	26,666	2.1	20,037	1.3	22,938	1.7	22,635	1.2	25,120	1.5	11.0	-1.5
Bioassay, bioinformatics and R&D service industry	37,682	2.9	51,024	3.3	43,277	3.1	44,432	2.4	55,738	3.2	25.4	10.3

- In comparison to 2014, overall size of r&d investment increased the most in 2015 in biochemical industry (by 21.6%), bioprocess and equipment industry (by 6.3%), biopharmaceutical industry (by 5.3%). However, it decreased in biofood industry (by 9.6%), bioenvironmental industry (by 3.8%).
- In comparison to 2014, overall size of facility investment increased the most in 2015 in bioassay, bioinformatics and R&D service industry (by 141.6%), bioenergy and biosource industry (by 69.8%). However, it decreased in biopharmaceutical industry (by 35.0%), bioelectronics industry (by 18.3%), and in biofood industry (by 0.7%).

<Table 2-17> 2011~2015 Bioindustry's Trend of R&D and Facility Investment Cost

(Unit : one hundred million Won, %)

Industrial Category	2011		2012		2013		2014		2015		Variation from the year before		Annual Average Rate of Change	
	R&D	Facility	R&D	Facility	R&D	Facility	R&D	Facility	R&D	Facility	R&D	Facility	R&D	Facility
Total	9,302	3,605	10,079	5,417	11,547	2,216	12,486	5,858	13,126	4,120	5.1	-29.7	9.0	3.4
Biopharmaceutical industry	6,292	2,741	6,670	4,758	8,475	1,734	9,464	5,442	9,964	3,535	5.3	-35.0	12.2	6.6
Biochemical industry	966	243	1,137	211	952	152	972	140	1,182	185	21.6	31.5	5.2	-6.6
Biofood industry	1,136	313	1,231	168	1,082	154	957	133	865	132	-9.6	-0.7	-6.6	-19.4
Bioenvironmental industry	114	30	120	32	107	19	96	17	92	18	-3.8	5.2	-5.3	-12.1
Bioelectronics industry	182	21	209	16	208	18	229	13	228	11	-0.5	-18.3	5.8	-15.2
Bioprocess and equipment industry	200	27	212	20	186	15	198	12	210	16	6.3	25.5	1.3	-12.9
Bioenergy and biosource industry	180	87	184	16	208	21	202	24	211	41	4.0	69.8	4.0	-17.4
Bioassay, bioinformatics and R&D service industry	233	144	314	196	330	103	368	76	374	183	1.5	141.6	12.6	6.2

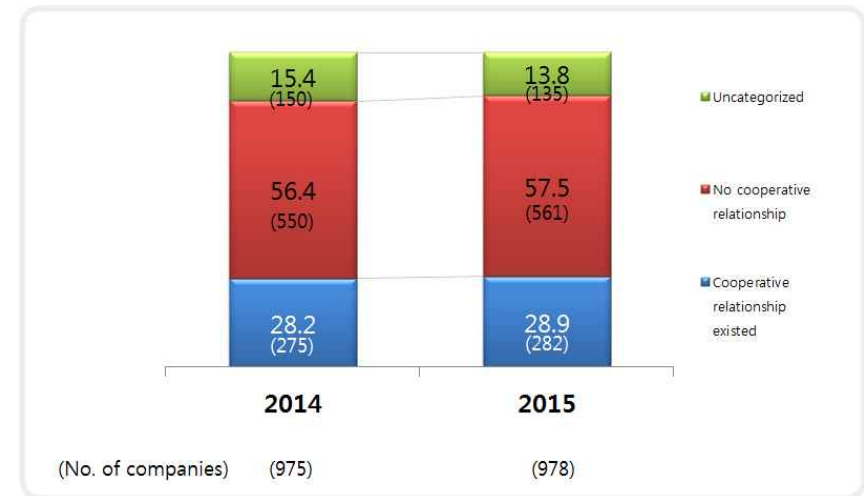
4 Cooperation with Other Organizations

A. Cooperation Types

1) Cooperative Relationship with Other Organizations

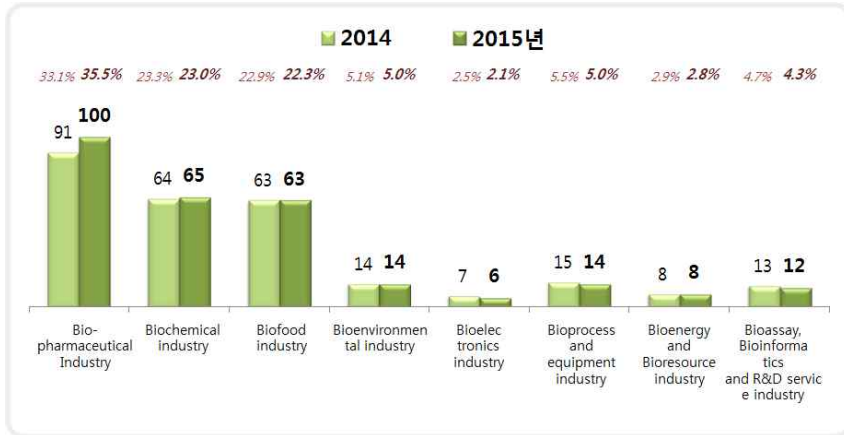
- Of 978 companies in total, 282 companies, 28.9%, have cooperative relationships with other organizations as of 2015.

< Figure 2-18 > Cooperative Relationship with Other Organizations



○ By bioindustrial categories, cooperative relationship was established in larger numbers in the order of biopharmaceutical, biochemical and biofood industries. The total number of cooperative relationships in the three industrial categories put together is 218, which is 80.9% of 275 companies holding cooperative relationships.

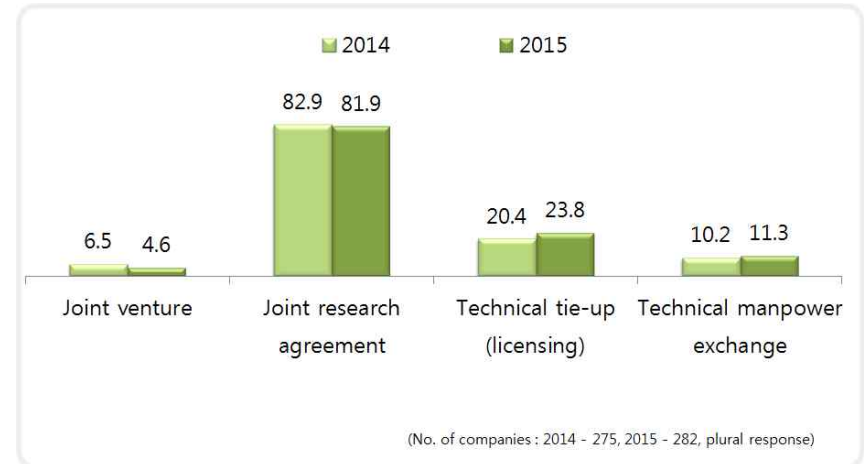
< Figure 2-19 > No. of Companies Holding Cooperative Relationships by Bioindustrial Category



2) Types of Cooperative Relationship with Other Organizations

○ Based on 282 companies, the most frequently found type of cooperative relationship was joint R&D contract at 81.9%. It was followed by technical tie-up and licensing (23.8%), domestic and international technical manpower exchange (11.3%) and joint investment (4.6%).

< Figure 2-20 > Types of Cooperative Relationship with Other Organizations

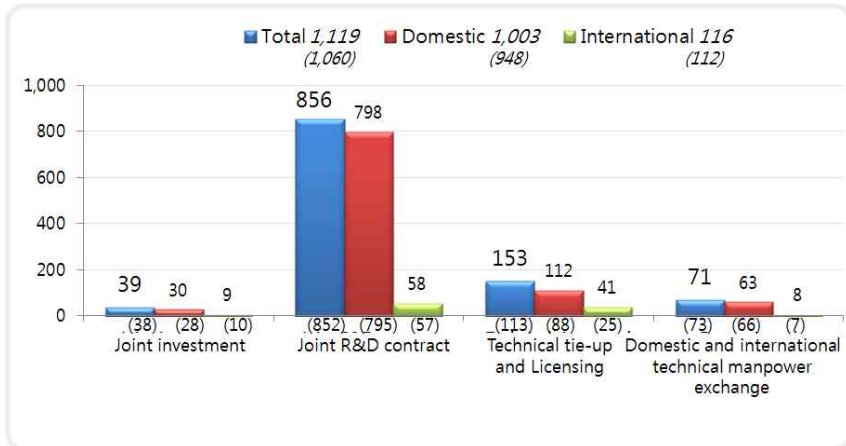


* Based on 282 companies with cooperative relationships. Multiple responses accepted.

3) Number of Cooperation Cases by Cooperative Relationship Type

- The total number of cooperative relationships of 282 companies is 1,119 which is broken down into 1,003 cooperative relationships in Korea (89.6%) and 116 abroad (10.4%).
- The number of joint R&D contracts is 798 in Korea and 58 in abroad (856 in total). This is the most frequently found cooperative relationship type.

< Figure 2-21 > No. of Cooperation Cases by Cooperative Relationship Type
(Unit : Cases)



* Based on 282 companies with cooperative relationships.
Multiple responses accepted.
* Numbers in brackets are based on 2014 results.

- The number of cooperation cases by bioindustrial category and cooperation type is 443 in biopharmaceutical industry. This accounts for 39.6% of 1,119 cases in total.
- The number of cooperation cases in biofood and biochemical industries are 254 (22.7%) and 182 (16.3%) respectively. Number of cooperation cases by above mentioned 3 industries covers about 78.6% of total cases.

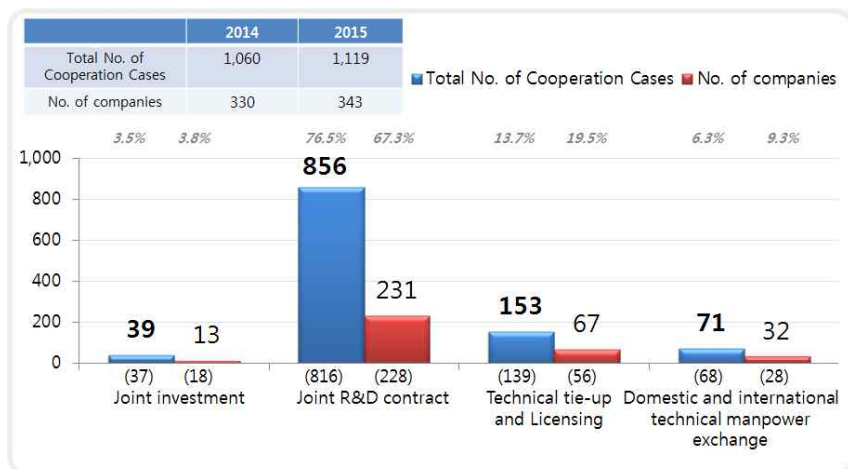
< Table 2-18 > No. of Cooperation Cases by Bioindustrial Category and Cooperation Type
(Unit : Cases)

Industrial Category	2014		2015		Cooperation Type			
	Total	%	Total	%	Joint Investment	Joint R&D Contract	Technical Tie-up and Licensing	Technical Manpower Exchange
Total	1,060	(100.0%)	1,119	(100.0%)	39	856	153	71
Biopharmaceutical industry	401	(37.8%)	443	(39.6%)	35	302	95	11
Biochemical industry	173	(16.3%)	182	(16.3%)	1	147	24	10
Biofood industry	238	(22.5%)	254	(22.7%)	2	236	8	8
Bioenvironmental industry	28	(2.6%)	25	(2.2%)	1	14	9	1
Bioelectronics industry	74	(7.0%)	58	(5.2%)	-	35	2	21
Bioprocess and equipment industry	45	(4.2%)	38	(3.4%)	-	31	4	3
Bioenergy and bioresource industry	33	(3.1%)	33	(2.9%)	-	20	8	5
Bioassay, bioinformatics and R&D service industry	68	(6.4%)	86	(7.7%)	-	71	3	12

4) Number of Partners by Cooperative Relationship Type

○ As for cooperation types, 231 companies have established joint R&D contract relationships and the count of cooperation was found to be 856. It is identified that a company holding a joint R&D contract relationship has conducted an average of 3.7 cooperation cases arithmetically.

< Figure 2-22 > No. of Partners by Cooperative Relationship Type (Unit : Cases, Count)



* Based on 282 companies with cooperative relationships.

Multiple responses accepted.

* Numbers in brackets are based on 2014 results.

○ The number of companies holding cooperative relationships was the largest at 131 in biopharmaceutical industry. It was followed by biochemical and biofood industries.

< Table 2-19 > No. of Partners by Bioindustrial Category and Cooperation

Type (Unit: Count)

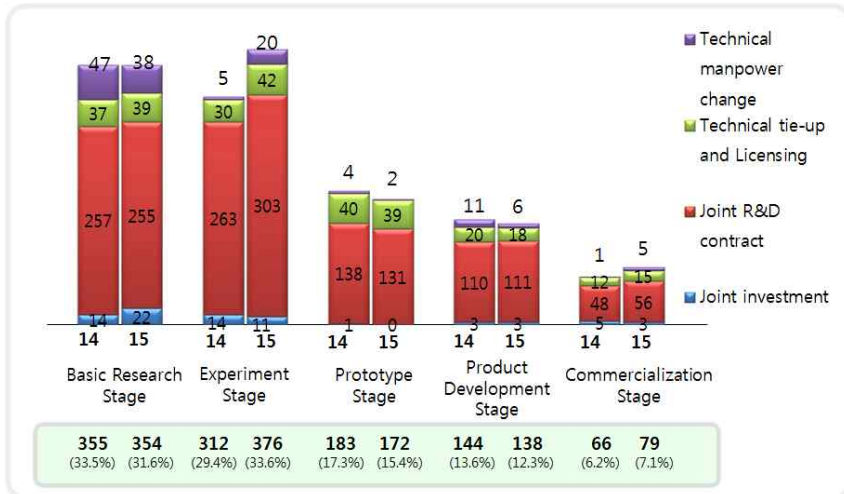
Industrial Category	2014		2015		Cooperation Type			
	Companies in Total	%	Companies in Total	%	Joint Investment	Joint R&D Contract	Technical Tie-up and Licensing	Technical Manpower Exchange
Total	330	(100.0%)	343	(100.0%)	13	231	67	32
Biopharmaceutical industry	121	(36.7%)	131	(38.2%)	9	79	35	8
Biochemical industry	75	(22.7%)	77	(22.4%)	1	55	14	7
Biofood industry	66	(20.0%)	69	(20.1%)	2	53	8	6
Bioenvironmental industry	16	(4.8%)	16	(4.7%)	1	9	5	1
Bioelectronics industry	8	(2.4%)	8	(2.3%)	-	6	1	1
Bioprocess and equipment industry	17	(5.2%)	16	(4.7%)	-	12	2	2
Bioenergy and bioresource industry	9	(2.7%)	10	(2.9%)	-	6	1	3
Bioassay, bioinformatics and R&D service industry	18	(5.5%)	16	(4.7%)	-	11	1	4

B. Cooperation Stages

1) Number of Cooperation Cases by Cooperation Stage

- As per cooperation stage, 1,119 cooperation cases, the largest, were completed in the stage of basic research, which is 33.6% of 1,119 cases in total. It was followed by 354 cases in experiment stage (31.6%).
- In commercialization stage, the final stage, 79 cases (7.1%) were completed, which is a relatively smaller number. This indicates that the companies cooperate frequently with other organizations in basic research and experiment stages, the initial stages.
- Compared to its previous year, portion of cooperation cases in basic research stage and experiment stage slightly increased.

< Figure 2-23 > No. of Cooperation Cases by Cooperation Stage (Unit : Cases)



* Based on 282 companies with cooperative relationships.
Multiple responses accepted.

< Table 2-20 > No. of Cooperation Cases by Cooperation Stage (Unit : Cases)

Classification	Cooperative Relationships in Total	Domestic					Overseas				
		Total	Joint Investment	Joint R&D	Technical Tie-up	Technical Manpower Exchange	Total	Joint Investment	Joint R&D	Technical Tie-up	Technical Manpower Exchange
Total of 2014	1,060	948	26	754	106	62	112	11	62	33	6
Total of 2015	1,119	1,003	30	798	112	63	116	9	58	41	8
Basic Research Stage	354	339	21	246	35	37	15	1	9	4	1
Experiment Stage	376	343	6	284	34	19	33	5	19	8	1
Prototype Stage	172	132	-	115	17	-	40	-	16	22	2
Product Development Stage	138	125	2	102	16	5	13	1	9	2	1
Commercialization Stage	79	64	1	51	10	2	15	2	5	5	3

- By industry classification, no. of cooperations cases were most frequent in experiment stage for biopharmaceutical industry, biofood industry, and bioassay, bioinformatics and r&d service industry, while it occurred more frequent in basic research stage in other industry areas.

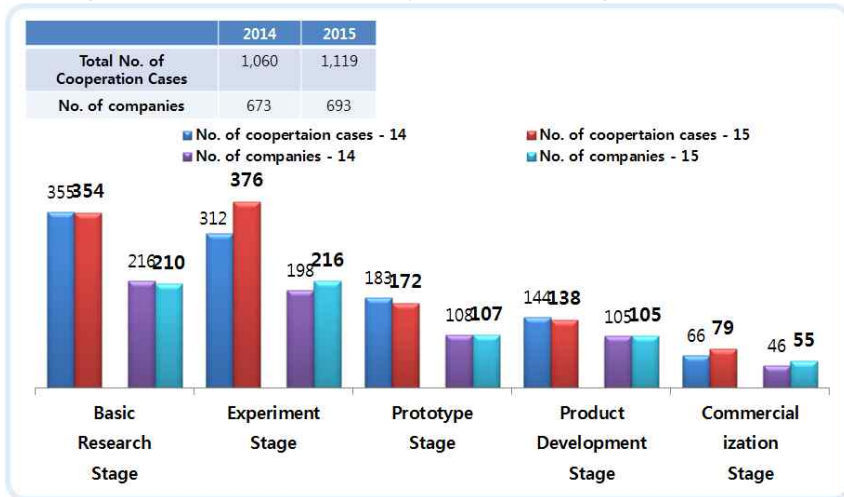
< Table 2-21 > No. of Cooperation Cases by Bioindustrial Category and Cooperation Stage (Unit : Cases)

Industrial Category	Companies in Total	Companies with Cooperative Relationships	Cooperation Stage					Total
			Basic Research Stage	Experiment Stage	Prototype Stage	Product Development Stage	Commercialization Stage	
Total	978	282	354	376	172	138	79	1,119 (100.0%)
Biopharmaceutical industry	330	100	122	155	96	51	19	443 (39.6%)
Biochemical industry	206	65	46	44	21	33	38	182 (16.3%)
Biofood industry	197	63	68	117	23	38	8	254 (22.7%)
Bioenvironmental industry	76	14	10	5	4	1	5	25 (2.2%)
Bioelectronics industry	22	6	43	3	7	3	2	58 (5.2%)
Bioprocess and equipment industry	71	14	8	10	7	9	4	38 (3.4%)
Bioenergy and bioresource industry	26	8	10	9	10	1	3	33 (2.9%)
Bioassay, bioinformatics and R&D service industry	50	12	47	33	4	2	-	86 (7.7%)

2) Number of Partners by Cooperation Stage

- The number of companies with cooperative relationships by stage including those that made multiple responses is 693. By stage, 216 companies (31.2%) are in the stage of basic research.
- When cooperation case and company number percentages are compared, the percentage of company count is lower than the rate of cooperation cases in basic research and experiment stages. This indicates that the average cooperation cases per company are larger in the initial stages of cooperation than the later stages.

< Figure 2-24 > No. of Partners by Cooperation Stage (Unit : Cases, Count)



* Based on 282 companies with cooperative relationships. Multiple responses accepted.

< Table 2-22 > No. of Partners by Cooperation Stage (Unit : Cases, Count)

Classification		Total	Basic Research	Experimental	Prototype	Product Development	Commercialization
No. of cases	Domestic	1,003	339	343	132	125	64
	Overseas	116	15	33	40	13	15
Total		1,119	354	376	172	138	79
Percentage		100.0	31.6	33.6	15.4	12.3	7.1
No. of companies	Domestic	617	195	197	88	95	42
	Overseas	76	15	19	19	10	13
Total		693	210	216	107	105	55
Percentage		100.0	30.3	31.2	15.4	15.2	7.9

- As for the number of partners by bioindustrial category and cooperation stage, there was a total of 559 partners in biopharmaceutical, biochemical and biofood industries(80.7% of all partners).
- In biopharmaceutical and biofood industries, the percentage of experiment stage was found to be high.

< Table 2-23 > No. of Partners by Bioindustrial Category and Cooperation Stage (Unit : Count)

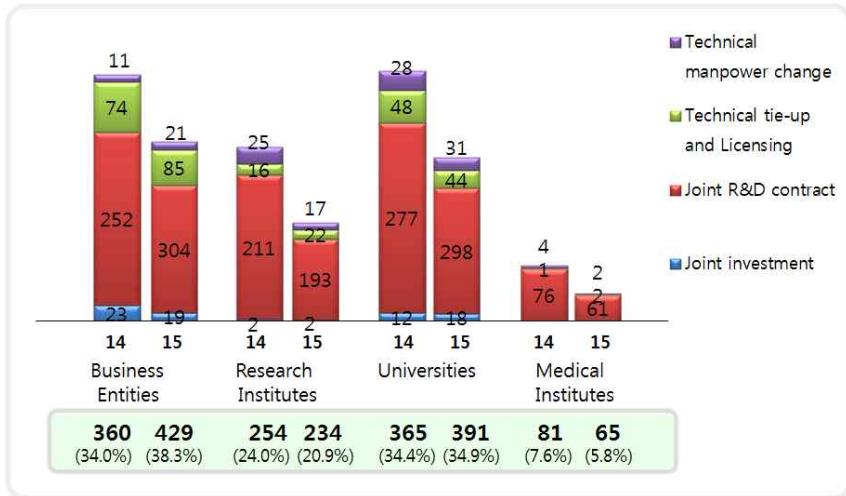
Industrial Category	2014		2015		Cooperation Stage				
	Companies in Total	%	Companies in Total	%	Basic Research	Experimental	Prototype	Product Development	Commercialization
Total	673	(100.0%)	693	(100.0%)	210	216	107	105	55
Biopharmaceutical industry	249	(37.0%)	278	(40.1%)	81	95	50	36	16
Biochemical industry	132	(19.6%)	132	(19.0%)	38	34	17	26	17
Biofood industry	150	(22.3%)	149	(21.5%)	43	51	19	28	8
Bioenvironmental industry	26	(3.9%)	22	(3.2%)	7	5	4	1	5
Bioelectronics industry	25	(3.7%)	24	(3.5%)	11	3	5	3	2
Bioprocess and equipment industry	33	(4.9%)	30	(4.3%)	5	7	6	8	4
Bioenergy and bioresource industry	25	(3.7%)	25	(3.6%)	9	9	3	1	3
Bioassay, bioinformatics and R&D service industry	33	(4.9%)	33	(4.8%)	16	12	3	2	-

C. Cooperating Organizations

1) Number of Cooperation Cases by Cooperating Organization

○ By cooperating organization, the number of cooperation cases with Business Entities was the largest at 429, which is 38.3% of 1,119 cases in total. It was followed by cooperation cases with Universities (391), research institutes (234) and medical institutes (65).

< Figure 2-25 > No. of Cooperation Cases by Cooperating Organization (Unit : Cases)



* Based on 282 companies with cooperative relationships. Multiple responses accepted.

< Table 2-24 > No. of Cooperation Cases by Cooperating Organization (Unit : Cases)

Classification	Cooperative Relationships in Total	Domestic					Overseas				
		Total	Joint Investment	Joint R&D	Technical Tie-up	Technical Manpower Exchange	Total	Joint Investment	Joint R&D	Technical Tie-up	Technical Manpower Exchange
Total	1,119	1,003	30	798	112	63	116	9	58	41	8
Business Entities	429	347	10	265	55	17	82	9	39	30	4
Small and Medium-scale Venture Companies	298	242	8	173	44	17	56	5	26	21	4
Middle-standing Companies	80	75	1	69	5	-	5	-	3	2	-
Large Enterprises	51	30	1	23	6	-	21	4	10	7	-
Research Institutes	234	221	2	188	14	17	13	-	5	8	-
Government-invested Research Institutes	185	174	1	154	10	9	11	-	3	8	-
Private Research Institutes	49	47	1	34	4	8	2	-	2	-	-
Universities	391	374	18	287	42	27	17	-	11	2	4
Medical Institutes	65	61	-	58	1	2	4	-	3	1	-

○ By bioindustrial category, the number of cooperation cases in biopharmaceutical and biofood industry were the largest with business entities. However, the cases of cooperation with in biochemical industries was relatively larger with research Institutes.

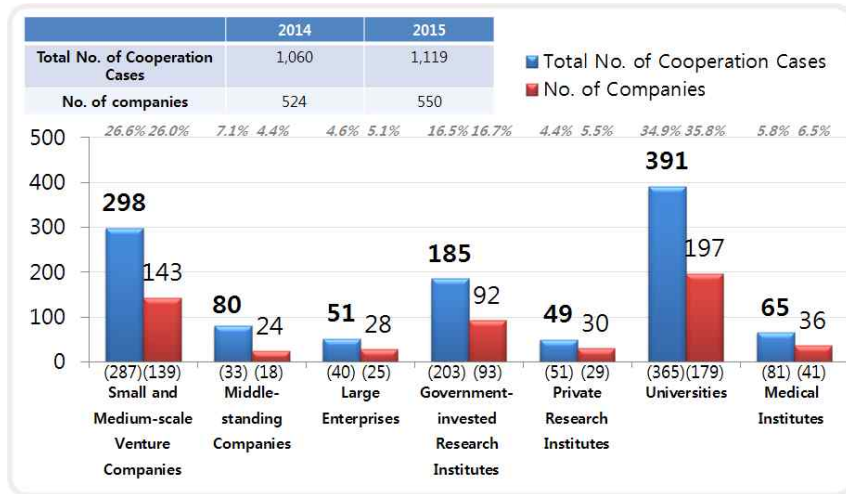
< Table 2-25 > No. of Cooperation Cases by Bioindustrial Category and Cooperating Organization (Unit : Cases)

Industrial Category	Companies in Total	Companies with Cooperative Relationships	Cooperating Organization				Total	
			Business Entities	Research Institutes	Universities	Medical Institutes		
Total	978	282	429	234	391	65	1,119	(100.0%)
Biopharmaceutical industry	330	100	192	54	156	41	443	(39.6%)
Biochemical industry	206	65	57	71	54	-	182	(16.3%)
Biofood industry	197	63	110	31	105	8	254	(22.7%)
Bioenvironmental industry	76	14	9	3	13	-	25	(2.2%)
Bioelectronics industry	22	6	10	21	23	4	58	(5.2%)
Bioprocess and equipment industry	71	14	9	13	12	4	38	(3.4%)
Bioenergy and bioresource industry	26	8	12	11	7	3	33	(2.9%)
Bioassay, bioinformatics and R&D service industry	50	12	30	30	21	5	86	(7.7%)

2) Number of Partners by Cooperating Organization

- The number of bio-companies holding cooperative relationships with universities is 197. It was found that an average of 2 cooperation cases was completed per each of these companies.

< Figure 2-26 > No. of Partners by Cooperating Organization (Unit : Cases, Count)



- * Based on 282 companies with cooperative relationships. Multiple responses accepted.
- * Numbers in brackets are based on 2014 results.

- By bioindustrial category, the number of partners in biopharmaceutical industry was the largest with business entities. However, the partners of cooperation in biochemical and biofood industries were relatively larger with universities.

< Table 2-26 > No. of Partners by Bioindustrial Category and Cooperating Organization (Unit : Cases)

Industrial Category	Companies in Total	Companies with Cooperative Relationships	Cooperating Organization				Total
			Business Entities	Research Institutes	Universities	Medical Institutes	
Total	978	282	195	122	197	36	550 (100.0%)
Biopharmaceutical industry	330	100	96	36	70	20	222 (40.4%)
Biochemical industry	206	65	31	36	39	-	106 (19.3%)
Biofood industry	197	63	34	22	47	6	109 (19.8%)
Bioenvironmental industry	76	14	6	3	10	-	19 (3.5%)
Bioelectronics industry	22	6	5	5	5	4	19 (3.5%)
Bioprocess and equipment industry	71	14	7	8	9	3	27 (4.9%)
Bioenergy and bioresource industry	26	8	9	4	7	2	22 (4.0%)
Bioassay, bioinformatics and R&D service industry	50	12	7	8	10	1	26 (4.7%)

< Table 2-27 > Domestic and Overseas Cooperative Relationships and Cooperating Organizations (Unit : Cases, Count, %)

Classification		Total	Venture Companies	Middle-standing Companies	Large Enterprises	Government-invested Research Institutes	Private Research Institutes	Universities	Medical Institutes	
Joint investment	Total Investments	Domestic	30	8	1	1	1	18	-	
		Overseas	9	5	-	4	-	-	-	
		Subtotal	39	13	1	5	1	1	18	-
	No. of Companies	Domestic	13	4	1	1	1	1	5	-
		Overseas	7	5	-	2	-	-	-	-
		Subtotal	20	9	1	3	1	1	5	-
Joint R&D contract	Total Investments	Domestic	798	173	69	23	154	34	287	58
		Overseas	58	26	3	10	3	2	11	3
		Subtotal	856	199	72	33	157	36	298	61
	No. of Companies	Domestic	364	76	15	14	75	20	134	30
		Overseas	35	14	2	4	3	2	8	2
		Subtotal	399	90	17	18	78	22	142	32
Technical tie-up and Licensing	Total Investments	Domestic	112	44	5	6	10	4	42	1
		Overseas	41	21	2	7	8	-	2	1
		Subtotal	153	65	7	13	18	4	44	2
	No. of Companies	Domestic	71	23	4	5	8	4	26	1
		Overseas	20	12	2	2	1	-	2	1
		Subtotal	91	35	6	7	9	4	28	2
Technical manpower change	Total Investments	Domestic	63	17	-	-	9	8	27	2
		Overseas	8	4	-	-	-	-	4	-
		Subtotal	71	21	-	-	9	8	31	2
	No. of Companies	Domestic	33	6	-	-	4	3	18	2
		Overseas	7	3	-	-	-	-	4	-
		Subtotal	40	9	-	-	4	3	22	2
Cooperation Cases in Total		1,119	298	80	51	185	49	391	65	
Percentage		100.0	26.6	7.1	4.6	16.5	4.4	34.9	5.8	
Companies in Total		550	143	24	28	92	30	197	36	
Percentage		100.0	26.0	4.4	5.1	16.7	5.5	35.8	6.5	

3) Cooperating Organizations by Scale of Workers

- The number of cooperation cases between a small and medium-scale venture company with 1 - 299 workers and a same small and medium-scale venture company (with 1 - 299 workers) is large at 257.
- The numbers of cooperation cases between a bioindustrial company with 1 - less than 50 workers and a university is large at 191.

< Table 2-28 > Cooperating Organizations by Scale of Workers (Unit : Count)

Classification	Cooperative Relationships in Total	Business Entities				Research Institutes				Universities	Medical Institutes
		Total	Venture Companies	Middle-standing Companies	Large Enterprises	Total	Government-invested Research Institutes	Private Research Institutes			
Total	Total	1,119	429	298	80	51	234	185	49	391	65
	1 - less than 50 workers	492	165	128	15	22	114	92	22	191	22
	50 - 299	383	152	129	11	12	63	44	19	139	29
	300 - 999	89	18	18	-	-	35	30	5	29	7
	1,000 or more	155	94	23	54	17	22	19	3	32	7
Domestic	Total	1,003	347	242	75	30	221	174	47	374	61
	1 - less than 50 workers	436	124	98	14	12	103	81	22	187	22
	50 - 299	338	124	108	7	9	61	44	17	128	25
	300 - 999	86	15	15	-	-	35	30	5	29	7
	1,000 or more	143	84	21	54	9	22	19	3	30	7
Overseas	Total	116	82	56	5	21	13	11	2	17	4
	1 - less than 50 workers	56	41	30	1	10	11	11	-	4	-
	50 - 299	45	28	21	4	3	2	-	2	11	4
	300 - 999	3	3	3	-	-	-	-	-	-	-
	1,000 or more	12	10	2	-	8	-	-	-	2	-

* 1-less than 50 workers : 574 companies. 50-299 : 272 companies. 300 - 999 : 75 companies. 1,000 or more : 46 companies.

5 Supply and Demand Status of Bioindustry

A. Bioindustry's Supply and Demand Status of 2015

- Total size of supply in 2015 bioindustry reached 9.9 trillion won, and portion of production within total supply is 85.7% in portion, and its amount is 8.5 trillion won. Size of import is 1.4 trillion won (14.3% in portion). Total size of supply increased by 5.3% compared to last year.
- Total size of domestic demand is 5.6 trillion won, which occupies 56.9% of total supply and its portion slightly decreased compared to last year; however, total size of export is 4.3 trillion won and it occupies 43.1% of total supply.

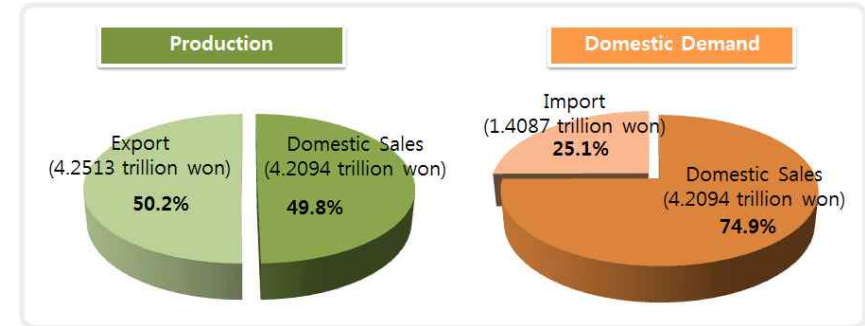
<Table 2-29> 2013~2015 Bioindustry's Trend of Supply and Demand

(Unit : one hundred million Won)

Year	Supply				Total	Demand			
	Production		Import			Domestic Demand		Export	
	Amount	Distribution Ratio	Amount	Distribution Ratio		Amount	Distribution Ratio	Amount	Distribution Ratio
2013	75,108	84.4	13,872	15.6	88,980	57,337	64.4	31,642	35.6
2014	76,070	84.5	14,006	15.5	90,076	56,024	62.2	34,052	37.8
2015	84,607	85.7	14,087	14.3	98,694	56,181	56.9	42,513	43.1
Annual Average Rate of Change	6.1		0.8		5.3	-1.0		15.9	

- The production size of domestic bioindustry in 2015 reached 8 trillion and 460.7 billion won. Among them, the domestic sales took 49.8% with 4 trillion and 209.4 billion won and the export took, 50.2% with 4 trillion and 251.3 billion won.
- The size of domestic demand due to domestic sales and import reached 5 trillion and 618.1 billion won. Among them, the domestic sales took 74.9% with 4 trillion and 209.4 billion won and the import took 25.1% with 1 trillion and 408.7 billion won.

<Figure 2-27> 2015 Bioindustry's Size of Production and Domestic Demand



- The production size of biopharmaceutical industry reached 3 trillion and 425.1 billion won which is 40.5% of the total industry, and biofood industry took 38.0% with 3 trillion and 217.4 billion won.
- The biopharmaceutical industry reaching 2 trillion and 751.4 billion won which is 49.0% and the biofood industry reaching 1 trillion and 327.5 billion won which is 23.6% took 72.6% of the bioindustry's domestic demand market.

<Table 2-30> 2015 Bioindustry's Status of Production and Domestic Demand

(Unit : million Won, %)

Industrial Category	Production				Domestic Demand			
	Domestic Sales	Export	Total	Distribution Ratio	Domestic Sales	Import	Total	Distribution Ratio
Total	4,209,360	4,251,346	8,460,706	100.0	4,209,360	1,408,699	5,618,059	100.0
Biopharmaceutical industry	1,530,701	1,894,416	3,425,116	40.5	1,530,701	1,220,685	2,751,386	49.0
Biochemical industry	436,206	135,203	571,409	6.8	436,206	87,710	523,916	9.3
Biofood industry	1,291,411	1,925,962	3,217,373	38.0	1,291,411	36,076	1,327,487	23.6
Bioenvironmental industry	30,311	303	30,614	0.4	30,311	119	30,430	0.5
Bioelectronics industry	30,774	129,425	160,199	1.9	30,774	770	31,544	0.6
Bioprocess and equipment industry	89,044	73,548	162,592	1.9	89,044	53,781	142,825	2.5
Bioenergy and bioresource industry	600,073	46,741	646,814	7.6	600,073	8,194	608,267	10.8
Bioassay, bioinformatics and R&D service industry	200,840	45,749	246,589	2.9	200,840	1,364	202,204	3.6

○ Size of supply and domestic demand in Gyeonggi area occupies 49.5%, 31.4% each in total industry and is the highest compared to other areas.

< Table 2-31 > 2015 Bioindustry's Status of Production and Domestic Demand by Area (Unit : million Won, %)

Area	Production				Domestic Demand			
	Domestic Sales	Export	Total	Distribution Ratio	Domestic Sales	Import	Total	Distribution Ratio
Total	4,209,360	4,251,346	8,460,706	100.0	4,209,360	1,408,699	5,618,059	100.0
Seoul	238,744	54,431	293,175	3.5	238,744	864,970	1,103,714	19.6
Busan	1,011	-	1,011	0.0	1,011	-	1,011	0.0
Daegu	8,899	1,209	10,108	0.1	8,899	-	8,899	0.2
Incheon	39,083	664,891	703,974	8.3	39,083	132,872	171,955	3.1
Gwangju	3,434	977	4,411	0.1	3,434	-	3,434	0.1
Daejeon	188,203	120,768	308,971	3.7	188,203	60,509	248,712	4.4
Ulsan	371,010	20,814	391,824	4.6	371,010	-	371,010	6.6
Sejong	22,920	170	23,090	0.3	22,920	1,859	24,779	0.4
Gyeonggi	1,600,425	2,586,695	4,187,120	49.5	1,600,425	163,492	1,763,917	31.4
Gangwon	78,762	135,545	214,307	2.5	78,762	5,416	84,178	1.5
Chungbuk	1,051,395	352,288	1,403,683	16.6	1,051,395	155,612	1,207,007	21.5
Chungnam	78,827	15,076	93,903	1.1	78,827	15,805	94,632	1.7
Jeonbuk	313,390	259,741	573,131	6.8	313,390	1,697	315,087	5.6
Jeonnam	157,216	1,163	158,379	1.9	157,216	-	157,216	2.8
Gyeongbuk	37,116	10,060	47,176	0.6	37,116	-	37,116	0.7
Gyeongnam	15,287	27,239	42,526	0.5	15,287	6,466	21,753	0.4
Jeju	3,638	281	3,919	0.0	3,638	-	3,638	0.1

B. Recent Trend of Supply and Demand Status

1) 2013~2015 Trend of Supply and Demand Status

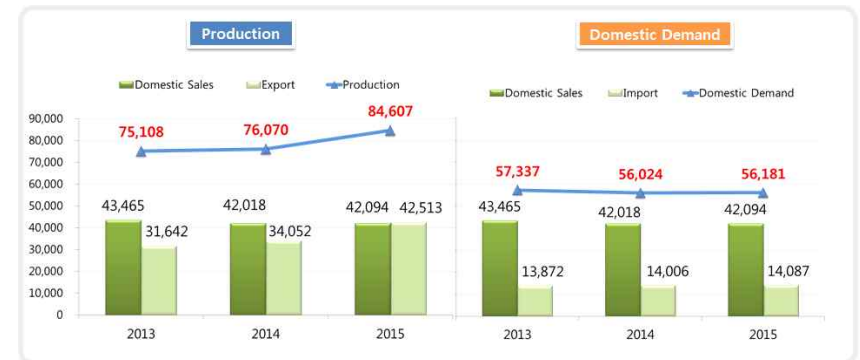
○ Bioindustry's trend of production from 2013 to 2015 continues to increase. Total size of domestic demand increased up to 2015 by 0.3% compared to its previous year.

○ For the average variation rate per year since 2013, the supply and demand marked 5.3%, production 6.1%, and domestic demand -1.0%.

<Table 2-32> 2013~2015 Bioindustry's Trend of Production and Domestic Demand (Unit : one hundred million Won, %)

Classification		2013	2014	2015	Annual Average Rate of Change
Supply and Demand (Production+Import)	Investment Amount	88,980	90,076	98,694	5.3
	Distribution Ratio	3.8	1.2	9.6	
Production (Domestic Sales+Export)	Investment Amount	75,108	76,070	84,607	6.1
	Distribution Ratio	5.1	1.3	11.2	
Domestic Demand (Domestic Sales+Import)	Investment Amount	57,337	56,024	56,181	-1.0
	Distribution Ratio	3.7	-2.3	0.3	

<Figure 2-28> 2013~2015 Bioindustry's Trend of Production and Domestic Demand (Unit : one hundred million Won)



- The production sector increased by 11.2% in 2015 compared to 2014, and Bioprocess and equipment industry industry reached the highest growth rate with 29.5%.
- Total supply of biopharmaceutical industry and biofood industry, which occupies the largest portion in the total industry, increased by 19.3% and 5.9%.
- The domestic demand sector decreased by 0.3% in 2015 compared to 2014.
- Domestic demand of biopharmaceutical industry equal to 2014, while that of biofood industry decreased by 5.4%, which are 2 industries that occupy largest portion in total industry.

<Table 2-33> 2013~2015 Bioindustry's Trend of Supply and Demand by Category
(Unit : one hundred million Won, %)

Industrial Category	Production					Domestic Demand				
	2012	2013	2014	Variation from the year before	Annual Average Rate of Change	2012	2013	2014	Variation from the year before	Annual Average Rate of Change
Total	75,108	76,070	84,607	11.2	6.1	57,337	56,024	56,181	0.3	-1.0
Biopharmaceutical industry	27,635	28,709	34,251	19.3	11.3	28,490	27,514	27,514	0.0	-1.7
Biochemical industry	5,622	5,484	5,714	4.2	0.8	5,147	4,972	5,239	5.4	0.9
Biofood industry	30,211	30,392	32,174	5.9	3.2	13,666	14,032	13,275	-5.4	-1.4
Bioenvironmental industry	301	306	306	0.0	0.9	303	306	304	-0.7	0.2
Bioelectronics industry	1,517	1,543	1,602	3.8	2.8	373	363	315	-13.1	-8.0
Bioprocess and equipment industry	1,216	1,255	1,626	29.5	15.6	1,294	1,203	1,428	18.7	5.1
Bioenergy and bioresource industry	6,659	6,217	6,468	4.0	-1.4	6,504	5,870	6,083	3.6	-3.3
Bioassay, bioinformatics and R&D service industry	1,947	2,161	2,466	14.1	12.5	1,560	1,764	2,022	14.6	13.8

2) 2011~2015 Trend of Supply and Demand

- Bioindustry's trend of supply and demand from 2011 to 2015 can be summarized as follows: Bioindustry's supply continues to increase upto 2015, while demand increased upto 2013 but slightly decreased in 2014 by 2.3%.
- Due to such tendency, growth range of total supply and demand is in increasing trend as of 2015, so average growth rate of total supply and demand since 2011 was 5.5%, and that of production was 7.2%, while that of demand was 1.9%.

<Table 2-34> 2011~2015 Bioindustry's Trend of Supply and Demand
(Unit : one hundred million Won, %)

Classification		2011	2012	2013	2014	2015	Annual Average Rate of Change
Supply and Demand (Production+Import)	Investment Amount	79,574	85,756	88,980	90,076	98,694	5.5
	Distribution Ratio	10.6	7.8	3.8	1.2	9.6	
Production (Domestic Sales+Export)	Investment Amount	63,963	71,445	75,108	76,070	84,607	7.2
	Distribution Ratio	10.5	11.7	5.1	1.3	11.2	
Domestic Demand (Domestic Sales+Import)	Investment Amount	52,081	55,281	57,337	56,024	56,181	1.9
	Distribution Ratio	9.6	6.1	3.7	-2.3	0.3	

<Figure 2-29> 2011~2015 Bioindustry's Trend of Supply and Demand
(Unit : one hundred million Won)



<Table 2-35> 2011~2015 Bioindustry's Trend of Supply and Demand by Category
(Unit : one hundred million Won, %)

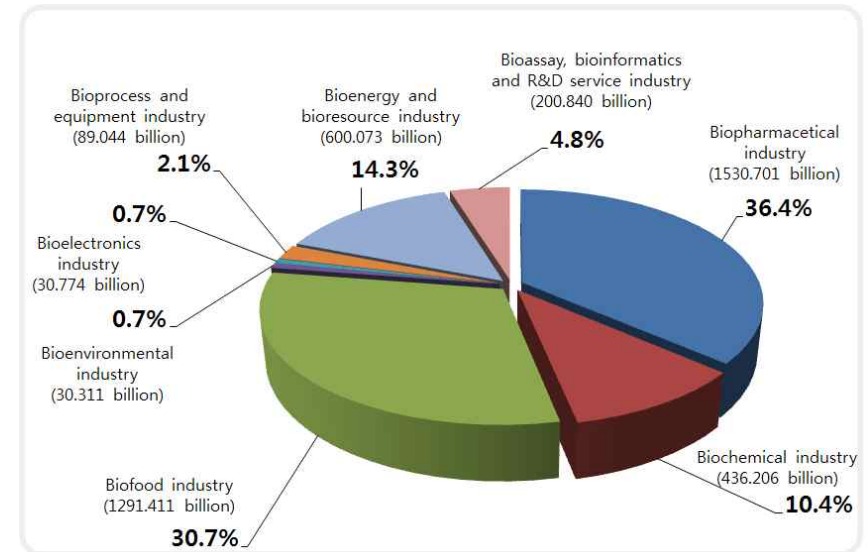
Industrial Category	Production							Domestic Demands						
	2011	2012	2013	2014	2015	Variation from the year before	Annual Average Rate of Change	2010	2011	2012	2013	2014	Variation from the year before	Annual Average Rate of Change
Total	63,964	71,445	75,108	76,070	84,607	11.2	7.2	52,081	55,281	57,337	56,024	56,181	0.3	1.9
Biopharmaceutical industry	24,607	27,087	27,635	28,709	34,251	19.3	8.6	27,367	28,194	28,490	27,514	27,514	0.0	0.1
Biochemical industry	4,305	5,030	5,622	5,484	5,714	4.2	7.3	4,354	4,749	5,147	4,972	5,239	5.4	4.7
Biofood industry	25,978	28,579	30,211	30,392	32,174	5.9	5.5	10,989	13,019	13,666	14,032	13,275	-5.4	4.8
Bioenvironmental industry	1,092	275	301	306	306	0.0	-27.2	1,066	277	303	306	304	-0.7	-26.9
Bioelectronics industry	1,164	1,238	1,517	1,543	1,602	3.8	8.3	239	242	373	363	315	-13.1	7.2
Bioprocess and equipment industry	811	1,219	1,216	1,255	1,626	29.5	19.0	2,496	1,308	1,294	1,203	1,428	18.7	-13.0
Bioenergy and bioresource industry	4,387	6,122	6,659	6,217	6,468	4.0	10.2	4,237	5,959	6,504	5,870	6,083	3.6	9.5
Bioassay, bioinformatics and R&D service industry	1,620	1,895	1,947	2,161	2,466	14.1	11.1	1,333	1,533	1,560	1,764	2,022	14.6	11.0

6 Domestic Sales of Bioindustry

A. Domestic Sales Status of 2015

- The size of bioindustry's domestic sales in 2015 reached 4 trillion and 209.4 billion won and biopharmaceutical industry took the largest proportion among them with 1 trillion and 530.7 billion won(36.4%).
- The following largest industries were biofood industry with 1 trillion and 291.4 billion won(30.7%) and bioenergy and bioresource industry with 600.1 billion won(14.3%).
- Biopharmaceutical industry, biofood industry, bioenergy and bioresource industry took 77.4%(78.9% in 2014) of the total market for the bioindustry's domestic sales in 2015.

<Figure 2-30> 2015 Bioindustry's Size of Domestic Sales by Category



- [Table 2-36] shows the domestic bioproducts or bioservices that have more than 1.0% domestic sales among 51 domestic bioproducts and bioservices, according to the size. Feed additive's size of domestic sales took 15.8% of the total bioindustry with 665.8 billion won.
- The following largest bioproducts or bioservices were Other biopharmaceuticals(13.5%), Biofuel(9.6%), Functional health foods(7.6%), Hemotherapeutics(7.5%). Among the TOP5 products, 2 items belonged to biofood industry.

<Table 2-36> 2015 Main Bioproduct's Size of Domestic Sales (Unit : million Won, %)

Ranking	Code	Product Name	Domestic Sales	Distribution Ratio
1	3050	Feed additives	665,750	15.8
2	1000	Other biopharmaceuticals	567,339	13.5
3	7010	Biofuel	402,803	9.6
4	3010	Functional health foods	319,109	7.6
5	2040	Hemotherapeutics	315,392	7.5
6	1030	Vaccines	289,707	6.9
7	1060	Biosmetics and home & personal care chemicals	266,156	6.3
8	3030	Food additives	166,587	4.0
9	7020	Artificial seeds and seedlings	126,731	3.0
10	1040	Hormones	113,401	2.7
11	1100	Animal medications	101,869	2.4
12	8050	Biosafety and efficacy evaluation services	92,781	2.2
13	3040	Fermented foods	89,762	2.1
14	1080	New therapeutics	54,908	1.3
15	1020	Anticancer medications	48,078	1.1
16	8020	Gene analysis services	47,212	1.1
17	7000	Other bioenergy and bioresources	44,854	1.1

B. Recent Trend of Domestic Sales Status

1) 2013~2015 Trend of Domestic Sales Status

- The size of bioindustry's domestic sales in 2015 increased by 7.6 billion won(0.2%) with 4 trillion and 209.4 billion won compared to 4 trillion and 201.8 billion won in 2014.

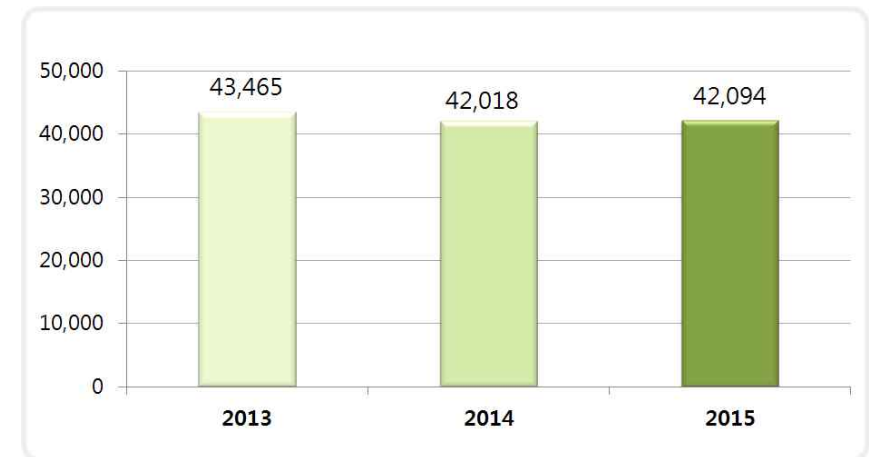
<Table 2-37> 2011~2015 Bioindustry's Trend of Domestic Sales

(Unit : one hundred million Won, %)

Classification		2013	2014	2015	Annual Average Rate of Change
Domestic Sales	Amount of money	43,465	42,018	42,094	-1.6
	Rate of Change	6.1	-3.3	0.2	

<Figure 2-31> 2013~2015 Bioindustry's Trend of Domestic Sales

(Unit : one hundred million Won)



- The growth size of biopharmaceutical industry increased by 0.1% with 19.6 billion won compared to 2014.
- Domestic sales volume of bioprocess and equipment industry increased as compared to 2014 by 35.8%, while that of bioassay, bioinformatics and R&D service industry increased by 14.8%, and their portion in total market also increased.
- However, domestic sales volume of biofood industry decreased (by 80.7 billion won), while that of bioelectronics industry also decreased by 4.8 billion won.

<Table 2-38> 2011~2015 Bioindustry's Trend of Domestic Sales by Category

(Unit : million Won, %)

Industrial Category	2013		2014		2015		Variation from the year before		Annual Average Rate of Change
	Domestic Sales	Distribution Ratio	Domestic Sales	Distribution Ratio	Domestic Sales	Distribution Ratio	Domestic Sales	Rate of Change	
Total	4,346,527	100.0	4,201,792	100.0	4,209,360	100.0	7,568	0.2	-1.6
Biopharmaceutical industry	1,627,163	37.4	1,528,742	36.4	1,530,701	36.4	1,959	0.1	-3.0
Biochemical industry	451,091	10.4	416,107	9.9	436,206	10.4	20,099	4.8	-1.7
Biofood industry	1,338,933	30.8	1,372,073	32.7	1,291,411	30.7	-80,662	-5.9	-1.8
Bioenvironmental industry	30,093	0.7	30,412	0.7	30,311	0.7	-101	-0.3	0.4
Bioelectronics industry	35,814	0.8	35,550	0.8	30,774	0.7	-4,776	-13.4	-7.3
Bioprocess and equipment industry	72,391	1.7	65,549	1.6	89,044	2.1	23,495	35.8	10.9
Bioenergy and bioresource industry	637,245	14.7	578,470	13.8	600,073	14.3	21,603	3.7	-3.0
Bioassay, bioinformatics and R&D service industry	153,797	3.5	174,888	4.2	200,840	4.8	25,952	14.8	14.3

2) 2011~2015 Trend of Domestic Sales

- Since 2011, the average variation rate per year for the past 5 years showed 3.7%.
- Total size of domestic sales continued to increase up to 2013 but slightly decreased in 2014 by 3.3% compared to its previous year, but total size remains above 4 trillion won.

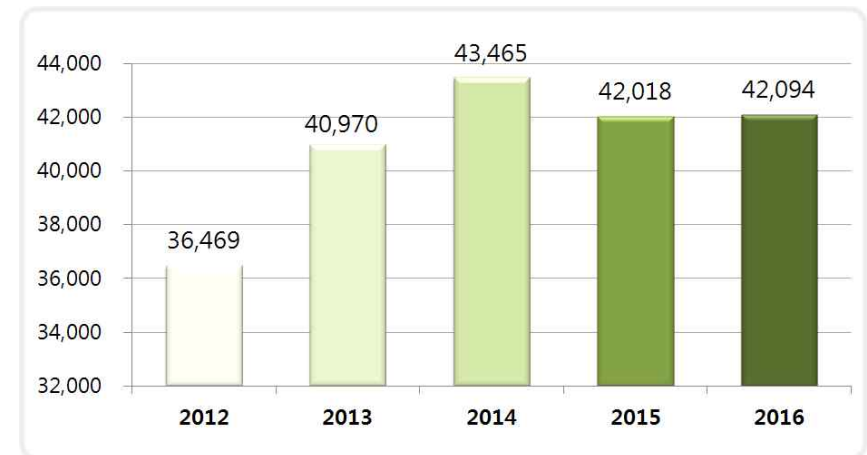
<Table 2-39> 2011~2015 Bioindustry's Trend of Domestic Sales

(Unit : one hundred million Won, %)

Classification	2011	2012	2013	2014	2015	Annual Average Rate of Change	
Domestic Sales	Amount of money	36,469	40,970	43,465	42,018	42,094	3.7
	Rate of Change	9.0	12.3	6.1	-3.3	0.2	

<Figure 2-32> 2011~2015 Bioindustry's Trend of Domestic Sales

(Unit : one hundred million Won)



<Table 2-40> 2011~2015 Bioindustry's Trend of Domestic Sales by Category

(Unit : million Won, %)

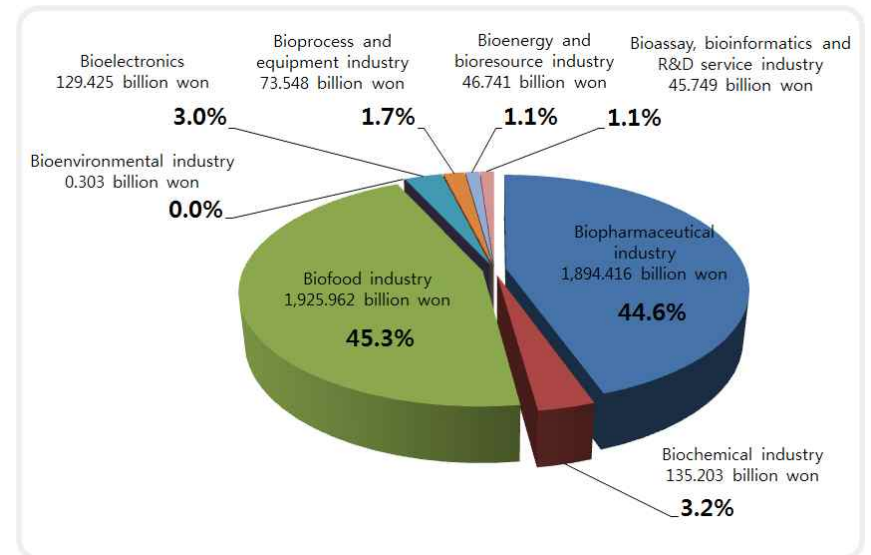
Industrial Category	2011		2012		2013		2014		2015		Variation from the year before		Annual Average Rate of Change
	Domestic Sales	Distribution Ratio	Domestic Sales	Distribution Ratio	Domestic Sales	Distribution Ratio	Domestic Sales	Distribution Ratio	Domestic Sales	Distribution Ratio	Domestic Sales	Rate of Change	
Total	3,646,896	100	2,907,448	100	4,346,527	100	4,201,792	100	4,209,360	100	7,568	0.2	3.7
Biopharmaceutical industry	1,506,329	41.3	1,577,524	54.3	1,627,163	37.4	1,528,742	36.4	1,530,701	36.4	1,959	0.1	0.4
Biochemical industry	355,684	9.8	406,185	14.0	451,091	10.4	416,107	9.9	436,206	10.4	20,099	4.8	5.2
Biofood industry	1,065,834	29.2	1,250,255	43.0	1,338,933	30.8	1,372,073	32.7	1,291,411	30.7	-80,662	-5.9	4.9
Bioenvironmental industry	106,381	2.9	27,446	0.9	30,093	0.7	30,412	0.7	30,311	0.7	-101	-0.3	-26.9
Bioelectronics industry	23,738	0.7	23,987	0.8	35,814	0.8	35,550	0.8	30,774	0.7	-4,776	-13.4	6.7
Bioprocess and equipment industry	43,895	1.2	76,691	2.6	72,391	1.7	65,549	1.6	89,044	2.1	23,495	35.8	19.3
Bioenergy and bioresource industry	413,275	11.3	582,984	20.1	637,245	14.7	578,470	13.8	600,073	14.3	21,603	3.7	9.8
Bioassay, bioinformatics and R&D service industry	131,760	3.6	151,952	5.2	153,797	3.5	174,888	4.2	200,840	4.8	25,952	14.8	11.1

7 Export Status of Bioindustry

A. Export Status of 2015

- The size of bioindustry's export in 2015 reached 4 trillion and 251.3 billion won.
- Biofood industry took the largest proportion with 1 trillion and 926.0 billion won(45.3%) and the following largest industry was biopharmaceutical industry with 1 trillion and 894.4 billion won(44.6%) according to the bioindustry's size of export by category.

<Figure 2-33> 2015 Bioindustry's Size of Export by Category



- [Table 2-41] shows domestic bioproducts or bioservices that have more than 1.0% export amount among 51 domestic bioproducts and bioservices, according to the size. 14 products showed more than 1.0% of exports.
- Feed additives ranked the highest amount of export with 1 trillion and 453.7 billion won(34.2%) and the following largest were Other biopharmaceuticals(13.4%), Immunotherapeutics(12.1%), Food additives(8.9%), and Vaccines(5.5%). Among the TOP5 products, 3 items belonged to biopharmaceutical and 2 items belonged to biofood industry.

<Table 2-41> 2015 Main Bioproduct's Export (Unit : million Won, %)

Ranking	Code	Product Name	Domestic Sales	Distribution Ratio
1	3050	Feed additives	1,453,657	34.2
2	1000	Other biopharmaceuticals	568,214	13.4
3	1050	Immunotherapeutics	514,228	12.1
4	3030	Food additives	377,648	8.9
5	1030	Vaccines	235,257	5.5
6	1090	Diagnostic kits	203,730	4.8
7	5040	Biosensors	128,121	3.0
8	1060	Hemotherapeutics	95,309	2.2
9	1010	Anticancer medications	81,907	1.9
10	1040	Hormones	80,065	1.9
11	1020	Antibiotics	79,960	1.9
12	3020	Amino acids	52,368	1.2
13	2030	Enzymes and reagents for research	43,074	1.0
14	2040	Biocosmetics and home & personal care chemicals	41,556	1.0

B. Recent Trend of Export Status

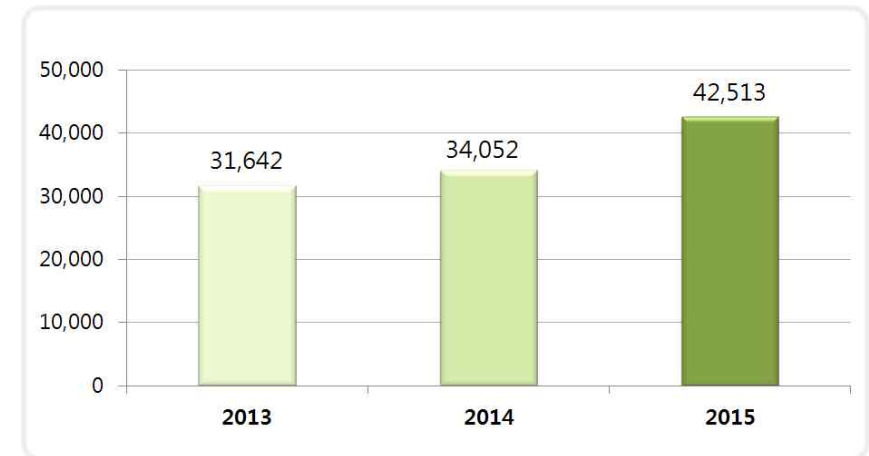
1) 2013~2015 Trend of Export

- The amount of bioindustry's export in 2015 increased by 846.2 billion won(24.8%) with 4 trillion and 251.3 billion won compared to 3 trillion and 405.2 billion won in 2014.

<Table 2-42> 2013~2015 Bioindustry's Trend of Export (Unit : one hundred million Won, %)

Classification	2013	2014	2015	Annual Average Rate of Change	
Export	Amount	31,642	34,052	42,513	15.9
	Rate of Change	3.8	7.6	24.8	

<Figure 2-34> 2013~2015 Bioindustry's Trend of Export (Unit : one hundred million Won)



- Biopharmaceutical industry export recorded the highest increase to 1 trillion 894.4 billion won by 552.2 billion won (41.1%) from 2014.

<Table 2-43> 2013~2015 Bioindustry's Trend of Export by Category

(Unit : million Won, %)

Industrial Category	2013		2014		2015		Variation from the year before		Annual Average Rate of Change
	Amount of Export	Distribution Ratio	Amount of Export	Distribution Ratio	Amount of Export	Distribution Ratio	Amount of Export	Rate of Change	
Total	3,164,248	100.0	3,405,174	100.0	4,251,346	100.0	846,172	24.8	15.9
Biopharmaceutical industry	1,136,385	35.9	1,342,190	39.4	1,894,416	44.6	552,225	41.1	29.1
Biochemical industry	111,110	3.5	132,339	3.9	135,203	3.2	2,865	2.2	10.3
Biofood industry	1,682,131	53.2	1,667,157	49.0	1,925,962	45.3	258,805	15.5	7.0
Bioenvironmental industry	12	0.0	192	0.0	303	0.0	111	58.0	402.6
Bioelectronics industry	115,882	3.7	118,782	3.5	129,425	3.0	10,643	9.0	5.7
Bioprocess and equipment industry	49,177	1.6	59,997	1.8	73,548	1.7	13,551	22.6	22.3
Bioenergy and bioresource industry	28,690	0.9	43,272	1.3	46,741	1.1	3,469	8.0	27.6
Bioassay, bioinformatics and R&D service industry	40,861	1.3	41,244	1.2	45,749	1.1	4,505	10.9	5.8

2) 2011~2015 Trend of Export

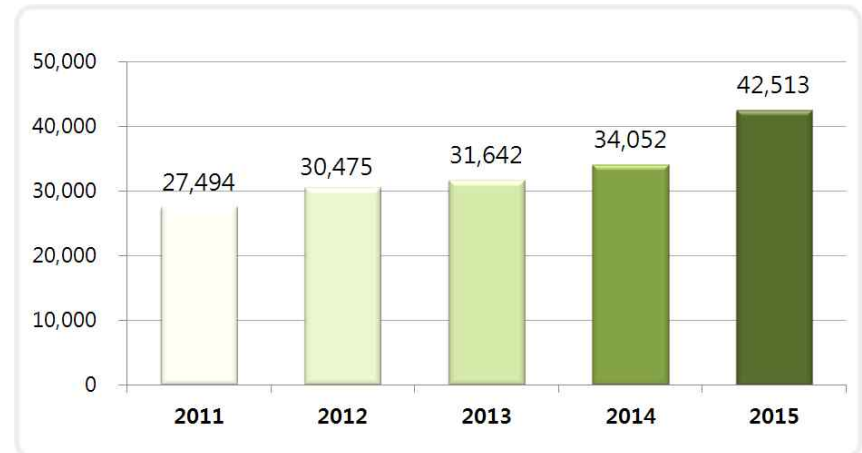
- Total size of export continued to increase since 2011, and had large increase in 2015.
- Since 2011, bioindustry's export showed continuous growth with 11.5% increase of average variation rate per year.

<Table 2-44> 2011~2015 Bioindustry's Trend of Export

(Unit : one hundred million Won, %)

Classification		2011	2012	2013	2014	2015	Annual Average Rate of Change
Export	Amount	27,494	30,475	31,642	34,052	42,513	11.5
	Rate of Change	12.6	10.8	3.8	7.6	24.8	

<Figure 2-35> 2011~2015 Bioindustry's Trend of Export (Unit : one hundred million Won)



<Table 2-45> 2011~2015 Bioindustry's Trend of Export by Category

(Unit : million Won, %)

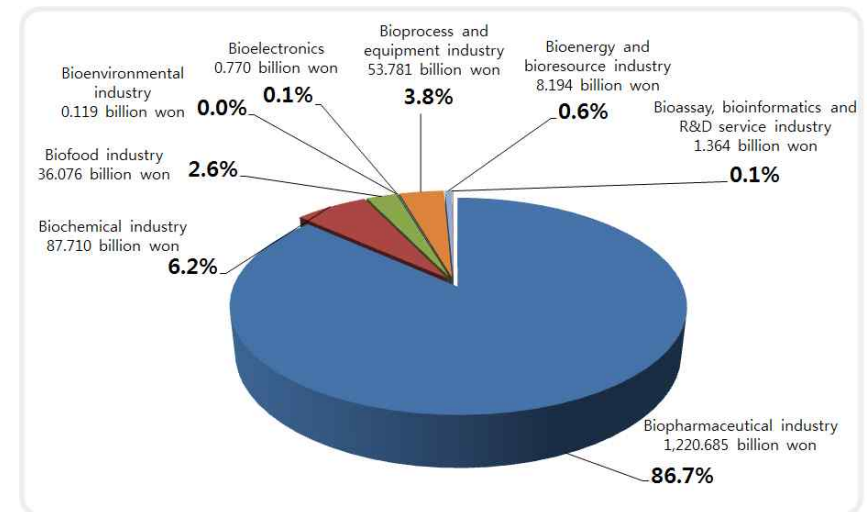
Industrial Category	2011		2012		2013		2014		2015		Variation from the year before		Annual Average Rate of Change
	Amount of Export	Distribution Ratio	Amount of Export	Distribution Ratio	Amount of Export	Distribution Ratio	Amount of Export	Distribution Ratio	Amount of Export	Distribution Ratio	Domes-tic Sales	Rate of Change	
Total	2,749,355	100.0	3,047,521	100.0	3,164,248	100.0	3,405,174	100.0	4,251,346	100.0	846,172	24.8	11.5
Biopharmaceutical industry	954,412	34.7	1,131,198	37.1	1,136,385	35.9	1,342,190	39.4	1,894,416	44.6	552,225	41.1	18.7
Biochemical industry	74,783	2.7	96,766	3.2	111,110	3.5	132,339	3.9	135,203	3.2	2,865	2.2	16.0
Biofood industry	1,531,965	55.7	1,607,654	52.8	1,682,131	53.2	1,667,157	49.0	1,925,962	45.3	258,805	15.5	5.9
Bioenvironmental industry	2,782	0.1	18	0.0	12	0.0	192	0.0	303	0.0	111	58.0	-42.5
Bioelectronics industry	92,623	3.4	99,841	3.3	115,882	3.7	118,782	3.5	129,425	3.0	10,643	9.0	8.7
Bioprocess and equipment industry	37,199	1.4	45,256	1.5	49,177	1.6	59,997	1.8	73,548	1.7	13,551	22.6	18.6
Bioenergy and bioresource industry	25,393	0.9	29,254	1.0	28,690	0.9	43,272	1.3	46,741	1.1	3,469	8.0	16.5
Bioassay, bioinformatics and R&D service industry	30,198	1.1	37,534	1.2	40,861	1.3	41,244	1.2	45,749	1.1	4,505	10.9	10.9

8 Import Status of Bioindustry

A. Import Status of 2015

- The size of bioindustry's import in 2015 reached 1 trillion and 408.7 billion won.
- Biopharmaceutical industry showed the highest proportion among the total import amount with 1 trillion and 220.7 billion won(86.7%) according to the bioindustry's size of import by category.

<Figure 2-36> 2015 Bioindustry's Size of Import by Category



- Among 51 domestic bioproducts and bioservices, there is 13 products that have more than 1.0% import amount.
- Among bioproducts, vaccines ranked the highest import amount among the total imports with 270.7 billion won(19.2%) and then the following highest products were hormones with 231.8 billion won(16.5%), other biopharmaceuticals with 215.7 billion won(15.3%), hemotherapeutics with 199.6 billion won(14.2%), and anticancer medications with 170.1 billion won(12.1%)
- 8 products among 14 belonged to biopharmaceutical industry according to the size of imports, and it took 85.0% among the total import amount.

<Table 2-46> 2015 Main Bioproduct's Import (Unit : million Won, %)

Ranking	Code	Product Name	Domestic Sales	Distribution Ratio
1	1030	Vaccines	270,708	19.2
2	1040	Hormones	231,750	16.5
3	1000	Other biopharmaceuticals	215,701	15.3
4	1060	Hemotherapeutics	199,641	14.2
5	1020	Anticancer medications	170,144	12.1
6	1050	Immunotherapeutics	62,733	4.5
7	6030	Bioprocess and analysis equipments	50,519	3.6
8	2030	Enzymes and reagents for research	44,189	3.1
9	1090	Diagnostic kits	30,714	2.2
10	2000	Other biochemicals	21,927	1.6
11	2020	Industrial enzymes and reagents	16,984	1.2
12	3010	Functional health foods	16,651	1.2
13	1010	Antibiotics	16,243	1.2

B. Recent Trend of Import Status

1) 2013~2015 Bioindustry's Trend of Import

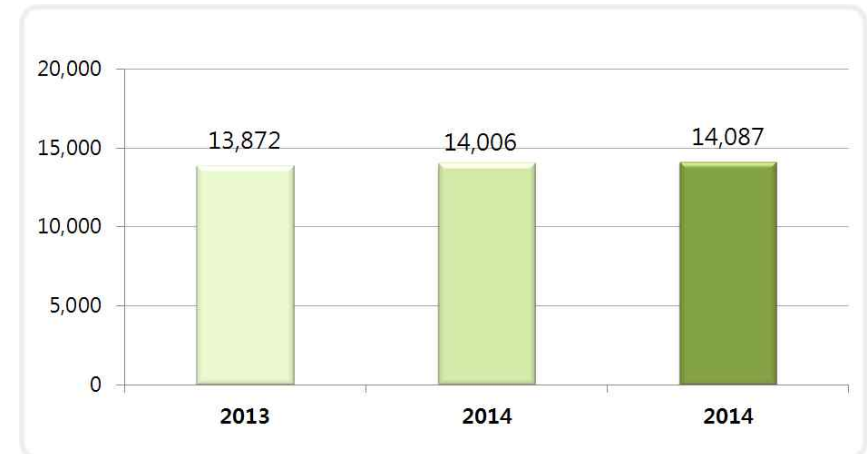
- The amount of bioindustry's import in 2015 increased by 8.1 billion won(0.6%) with 1 trillion and 408.7 billion won compared to 1 trillion and 400.6 billion won in 2014.
- The average variation rate per year for 2013~2015 is 0.8%.

<Table 2-47> 2013~2015 Bioindustry's Trend of Import

(Unit : one hundred million Won, %)

Classification	2013	2014	2015	Annual Average Rate of Change
Import	Amount	13,872	14,006	14,087
	Rate of Change	-3.1	1.0	0.6

<Figure 2-37> 2013~2015 Bioindustry's Trend of Import (Unit : one hundred million Won)



<Table 2-48> 2013~2015 Bioindustry's Trend of Import by Category

(Unit : million Won, %)

Industrial Category	2013		2014		2015		Variation from the year before		Annual Average Rate of Change
	Amount of Import	Distribution Ratio	Amount of Import	Distribution Ratio	Amount of Import	Distribution Ratio	Amount of Import	Rate of Change	
Total	1,387,198	100.0	1,400,645	100.0	1,408,699	100.0	8,054	0.6	0.8
Biopharmaceutical industry	1,221,854	88.1	1,222,661	87.3	1,220,685	86.7	-1,976	-0.2	0.0
Biochemical industry	63,609	4.6	81,114	5.8	87,710	6.2	6,596	8.1	17.4
Biofood industry	27,639	2.0	31,140	2.2	36,076	2.6	4,935	15.8	14.2
Bioenvironmental industry	226	0.0	226	0.0	119	0.0	-107	-47.3	-27.5
Bioelectronics industry	1,471	0.1	760	0.1	770	0.1	10	1.3	-27.6
Bioprocess and equipment industry	57,026	4.1	54,737	3.9	53,781	3.8	-956	-1.7	-2.9
Bioenergy and bioresource industry	13,142	0.9	8,525	0.6	8,194	0.6	-331	-3.9	-21.0
Bioassay, bioinformatics and R&D service industry	2,231	0.2	1,482	0.1	1,364	0.1	-118	-8.0	-21.8

2) 2011~2015 Bioindustry's Trend of Import

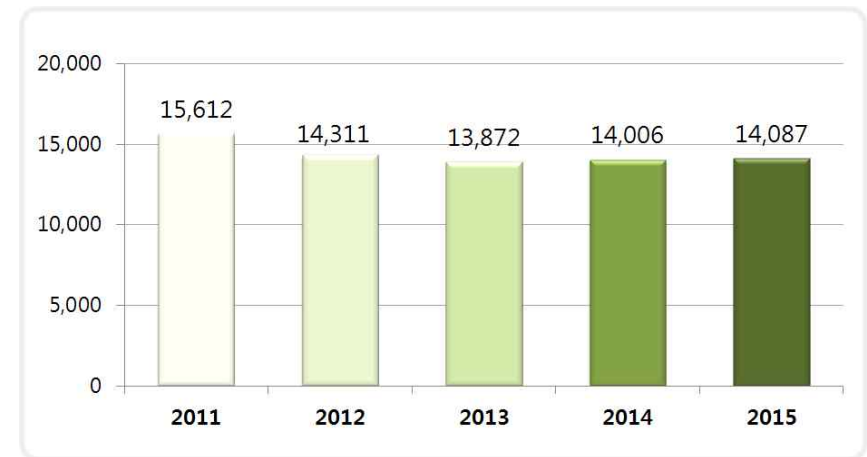
○ Domestic bioindustry's import decreased in 2012 and 2013, but increased again in 2014 and 2015. Its average increase rate of import per year marked -2.5% since 2011.

<Table 2-49> 2011~2015 Bioindustry's Trend of Import (Unit : one hundred million Won, %)

Classification		2011	2012	2013	2014	2015	Annual Average Rate of Change
Import	Amount	15,612	14,311	13,872	14,006	14,087	
	Rate of Change	11.1	-8.3	-3.1	1.0	0.6	

<Figure 2-38> 2011~2015 Bioindustry's Trend of Import

(Unit : one hundred million Won)



<Table 2-50> 2011~2015 Bioindustry's Trend of Import by Category

(Unit : one hundred million Won, %)

Industrial Category	2011		2012		2013		2014		2015		Variation from the year before		Annual Average Rate of Change
	Amount of Import	Distribution Ratio	Amount of Import	Distribution Ratio	Amount of Import	Distribution Ratio	Amount of Import	Distribution Ratio	Amount of Import	Distribution Ratio	Domestic Sales	Rate of Change	
Total	1,561,182	100	1,431,097	100	1,387,198	100	1,400,645	100	1,408,699	100	8,054	0.6	-2.5
Biopharmaceutical industry	1,230,328	78.8	1,241,893	86.8	1,221,854	88.1	1,222,661	87.3	1,220,685	86.7	-1,976	-0.2	-0.2
Biochemical industry	79,718	5.1	68,726	4.8	63,609	4.6	81,114	5.8	87,710	6.2	6,596	8.1	2.4
Biofood industry	33,073	2.1	51,680	3.6	27,639	2.0	31,140	2.2	36,076	2.6	4,935	15.8	2.2
Bioenvironmental industry	239	0.0	230	0.0	226	0.0	226	0.0	119	0.0	-107	-47.3	-16.0
Bioelectronics industry	150	0.0	248	0.0	1,471	0.1	760	0.1	770	0.1	10	1.3	50.5
Bioprocess and equipment industry	205,724	13.2	54,113	3.8	57,026	4.1	54,737	3.9	53,781	3.8	-956	-1.7	-28.5
Bioenergy and bioresource industry	10,436	0.7	12,897	0.9	13,142	0.9	8,525	0.6	8,194	0.6	-331	-3.9	-5.9
Bioassay, bioinformatics and R&D service industry	1514	0.1	1310	0.1	2231	0.2	1,482	0.1	1,364	0.1	-118	-8.0	-2.6

III. Statistical Tables

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< Table 1 > General Status of Company
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	Total	Seoul	Busan	Daegu	Incheon	Gwangju	Daejeon	Ulsan	Sejong	Gyeonggi	Gangwon	Chungbuk	Chungnam	Jeonbuk	Jeonnam	Gyeongbuk	Gyeongnam	Jeju
Number of companies	978	185	14	23	22	10	81	9	6	313	55	72	57	26	28	34	29	14
■ Sales Situation																		
No sales	281	52	5	8	9	3	18	2	2	106	12	14	17	6	9	7	6	5
Sales below break-even - 1 year	10	4	-	-	-	-	1	-	-	4	1	-	-	-	-	-	-	-
Sales below break-even - 2~3 years	63	10	1	1	2	2	9	1	1	14	6	6	1	2	2	3	2	-
Sales below break-even - 4~5 years	96	15	-	7	2	1	11	-	1	25	5	2	10	5	2	5	4	1
Sales below break-even - 6~9 years	91	16	2	2	1	1	10	1	-	24	10	6	1	3	4	4	5	1
Sales below break-even - 10 or more years	82	7	3	1	-	1	8	-	2	28	7	7	8	3	3	1	2	1
Sales below break-even - Unknown	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Sales below break-even - 1 year	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Sales below break-even - 2~3 years	15	1	-	1	2	1	-	-	-	5	1	2	-	-	-	-	2	-
Sales below break-even - 4~5 years	27	5	-	1	1	-	2	-	-	5	1	2	3	-	1	4	-	2
Sales above break-even - 6~9 years	58	5	1	1	2	-	8	2	-	12	2	8	3	1	4	4	4	1
Sales above break-even - 10 or more years	201	48	2	1	2	1	11	3	-	75	7	22	11	5	2	4	4	3
Sales - Unknown	52	22	-	-	1	-	3	-	-	15	3	2	2	1	1	2	-	-
■ Main type of industry																		
Biopharmaceutical industry	330	84	3	7	9	1	19	1	1	137	11	28	18	5	1	2	2	1
Biochemical industry	206	24	2	3	4	2	34	3	3	48	13	14	14	5	10	15	8	4
Biofood industry	197	22	7	4	4	2	7	-	2	45	18	19	8	10	10	14	7	-
Bioenvironmental industry	76	5	1	6	3	2	4	2	-	25	8	5	1	4	3	3	4	-
Bioelectronics industry	22	7	-	1	1	1	2	-	-	5	4	-	1	-	-	-	-	-
Bioprocess and equipment industry	71	20	-	1	1	1	7	-	-	31	1	1	4	-	2	2	-	-
Bioenergy and bioresource industry	26	1	1	-	-	-	2	3	-	8	-	3	-	3	2	1	1	1
Bioassay, bioinformatics and R&D service industry	50	22	-	1	-	1	6	-	-	14	-	2	1	1	-	1	-	1
□ No sales																		
Biopharmaceutical industry	101	25	1	2	5	-	2	-	-	46	1	8	6	2	1	-	1	1
Biochemical industry	47	5	-	1	-	-	12	1	1	11	1	3	3	2	2	1	1	1
Biofood industry	60	10	2	2	2	-	-	-	1	18	6	2	7	-	3	2	3	2
Bioenvironmental industry	23	2	1	3	2	-	1	-	-	7	3	1	-	-	1	2	-	-
Bioelectronics industry	7	4	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-
Bioprocess and equipment industry	22	5	-	-	-	1	-	-	-	12	-	-	1	-	2	1	-	-
Bioenergy and bioresource industry	11	1	1	-	-	-	1	1	-	5	-	-	-	1	-	-	1	-
Bioassay, bioinformatics and R&D service industry	10	-	-	-	-	1	2	-	-	6	-	-	-	-	-	-	-	1
□ Sales below break-even - 1 year																		
Biopharmaceutical industry	5	2	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
Biofood industry	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Bioenvironmental industry	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Bioelectronics industry	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
□ Sales below break-even - 2~3 years																		
Biopharmaceutical industry	19	5	-	-	1	-	2	-	-	7	2	2	-	-	-	-	-	-
Biochemical industry	20	2	-	-	-	2	4	-	1	4	1	-	1	-	1	3	1	-
Biofood industry	10	-	1	-	-	-	1	-	-	1	3	2	-	-	1	-	1	-
Bioenvironmental industry	3	-	-	-	1	-	-	-	-	-	-	1	-	1	-	-	-	-
Bioelectronics industry	3	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	4	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Bioenergy and bioresource industry	3	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
□ Sales below break-even - 4~5 years																		
Biopharmaceutical industry	23	3	-	1	-	1	1	-	-	12	2	-	2	-	-	1	-	-
Biochemical industry	22	4	-	1	1	-	5	-	1	2	1	1	3	-	-	2	1	-
Biofood industry	19	2	-	2	-	-	-	-	-	5	1	-	3	3	-	1	1	1
Bioenvironmental industry	10	1	-	2	-	-	1	-	-	1	-	1	-	1	1	-	2	-
Bioelectronics industry	3	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	-	-
Bioprocess and equipment industry	10	3	-	1	1	-	1	-	-	4	-	-	-	-	-	-	-	-
Bioenergy and bioresource industry	4	-	-	-	-	-	1	-	-	-	-	-	-	1	1	1	-	-
Bioassay, bioinformatics and R&D service industry	5	2	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-

	Total	Seoul	Busan	Daegu	Incheon	Gwangju	Daejeon	Ulsan	Sejong	Gyeonggi	Gangwon	Chungbuk	Chungnam	Jeonbuk	Jeonam	Gyeongbuk	Gyeongnam	Jeju
Number of companies	978	185	14	23	22	10	81	9	6	313	55	72	57	26	28	34	29	14
☐ Sales below break-even - 6~9 years																		
Biopharmaceutical industry	24	6	-	1	-	-	5	-	-	7	2	3	-	-	-	-	-	-
Biochemical industry	24	2	1	1	-	-	2	-	-	7	4	1	-	-	2	3	1	-
Biofood industry	24	3	1	-	1	-	2	-	-	4	2	1	1	2	2	1	3	1
Bioenvironmental industry	9	1	-	-	-	1	1	1	-	4	-	-	-	-	-	-	1	-
Bioelectronics industry	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	2	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
Bioenergy and bioresource industry	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	6	4	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-
☐ Sales below break-even - 10 or more years																		
Biopharmaceutical industry	28	3	1	-	-	-	3	-	1	12	1	2	3	2	-	-	-	-
Biochemical industry	12	1	1	-	-	-	2	-	-	3	-	1	2	-	1	-	1	-
Biofood industry	24	1	1	-	-	1	2	-	1	4	3	2	3	1	2	1	1	1
Bioenvironmental industry	6	-	-	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-
Bioelectronics industry	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	6	1	-	-	-	-	1	-	-	4	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	5	1	-	1	-	-	-	-	-	1	-	2	-	-	-	-	-	-
☐ Sales below break-even - Unknown																		
Biofood industry	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
☐ Sales below break-even - 1 year																		
Biofood industry	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
☐ Sales below break-even - 2~3 years																		
Biopharmaceutical industry	6	1	-	1	-	-	-	-	-	2	1	1	-	-	-	-	-	-
Biochemical industry	3	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-
Biofood industry	3	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	1	-
Bioenvironmental industry	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Bioelectronics industry	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
☐ Sales below break-even - 4~5 years																		
Biopharmaceutical industry	9	1	-	1	1	-	-	-	-	4	-	1	1	-	-	-	-	-
Biochemical industry	11	2	-	-	-	-	2	-	-	-	1	1	2	-	-	3	-	-
Biofood industry	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Bioenvironmental industry	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Bioelectronics industry	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Bioenergy and bioresource industry	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
☐ Sales above break-even - 6~9 years																		
Biopharmaceutical industry	11	2	-	-	1	-	2	1	-	3	-	-	-	-	-	1	1	-
Biochemical industry	17	-	-	-	1	-	2	-	-	3	1	4	1	-	2	1	1	1
Biofood industry	14	-	1	-	-	-	2	-	-	2	1	4	1	-	1	-	2	-
Bioenvironmental industry	5	-	-	1	-	-	1	-	-	-	-	-	-	1	1	1	-	-
Bioelectronics industry	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	6	1	-	-	-	-	1	-	-	3	-	-	1	-	-	-	-	-
Bioenergy and bioresource industry	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	3	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
☐ Sales above break-even - 10 or more years																		
Biopharmaceutical industry	75	17	1	1	1	-	3	-	-	34	2	10	6	-	-	-	-	-
Biochemical industry	37	7	-	-	-	-	3	2	-	11	2	3	2	2	1	-	2	2
Biofood industry	36	6	1	-	1	-	-	-	-	10	2	5	2	2	1	3	2	1
Bioenvironmental industry	15	-	-	-	-	1	-	1	-	9	-	2	1	1	-	-	-	-
Bioelectronics industry	4	2	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
Bioprocess and equipment industry	16	8	-	-	-	-	2	-	-	4	-	1	-	-	1	-	-	-
Bioenergy and bioresource industry	4	-	-	-	-	-	-	-	-	3	-	1	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	14	8	-	-	-	-	3	-	-	3	-	-	-	-	-	-	-	-
☐ Sales - Unknown																		
Biopharmaceutical industry	29	19	-	-	-	-	1	-	-	7	-	1	-	1	-	-	-	-
Biochemical industry	13	1	-	-	1	-	2	-	-	5	2	-	-	-	1	1	-	-
Biofood industry	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Bioenvironmental industry	2	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Bioprocess and equipment industry	4	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	2	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-

< Table 1-2 > Existence of other business within the company(II-4-1)

(Unit : number of firms)

	Total	Exclusive business	Plural businesses	Unknown
Number of companies	978	518	456	4
☐ Sales Situation				
No sales	281	139	142	-
Sales below break-even - 1 year	10	7	3	-
Sales below break-even - 2~3 years	63	35	28	-
Sales below break-even - 4~5 years	96	63	33	-
Sales below break-even - 6~9 years	91	55	36	-
Sales below break-even - 10 or more years	82	49	33	-
Sales below break-even - Unknown	1	-	1	-
Sales below break-even - 1 year	1	1	-	-
Sales below break-even - 2~3 years	15	8	7	-
Sales below break-even - 4~5 years	27	14	13	-
Sales above break-even - 6~9 years	58	34	24	-
Sales above break-even - 10 or more years	201	81	119	1
Sales - Unknown	52	32	17	3
☑ Main type of industry				
Biopharmaceutical industry	330	147	180	3
Biochemical industry	206	108	98	-
Biofood industry	197	104	93	-
Bioenvironmental industry	76	48	28	-
Bioelectronics industry	22	16	6	-
Bioprocess and equipment industry	71	49	21	1
Bioenergy and bioresource industry	26	12	14	-
Bioassay, bioinformatics and R&D service industry	50	34	16	-
☐ No sales				
Biopharmaceutical industry	101	46	55	-
Biochemical industry	47	20	27	-
Biofood industry	60	23	37	-
Bioenvironmental industry	23	15	8	-
Bioelectronics industry	7	6	1	-
Bioprocess and equipment industry	22	16	6	-
Bioenergy and bioresource industry	11	6	5	-
Bioassay, bioinformatics and R&D service industry	10	7	3	-
☐ Sales below break-even - 1 year				
Biopharmaceutical industry	5	2	3	-
Biofood industry	1	1	-	-
Bioenvironmental industry	1	1	-	-
Bioelectronics industry	1	1	-	-
Bioassay, bioinformatics and R&D service industry	2	2	-	-
☐ Sales below break-even - 2~3 years				
Biopharmaceutical industry	19	9	10	-
Biochemical industry	20	13	7	-
Biofood industry	10	6	4	-
Bioenvironmental industry	3	1	2	-
Bioelectronics industry	3	2	1	-
Bioprocess and equipment industry	4	2	2	-
Bioenergy and bioresource industry	3	1	2	-
Bioassay, bioinformatics and R&D service industry	1	1	-	-
☐ Sales below break-even - 4~5 years				
Biopharmaceutical industry	23	15	8	-
Biochemical industry	22	14	8	-
Biofood industry	19	12	7	-
Bioenvironmental industry	10	7	3	-
Bioelectronics industry	3	2	1	-
Bioprocess and equipment industry	10	8	2	-
바이오에너지 및 자원산업	4	3	1	-
Bioassay, bioinformatics and R&D service industry	5	2	3	-

	Total	Exclusive business	Plural businesses	Unknown
Number of companies	978	518	456	4
<input type="checkbox"/> Sales below break-even - 6~9 years				
Biopharmaceutical industry	24	14	10	-
Biochemical industry	24	13	11	-
Biofood industry	24	17	7	-
Bioenvironmental industry	9	6	3	-
Bioelectronics industry	1	-	1	-
Bioprocess and equipment industry	2	1	1	-
Bioenergy and bioresource industry	1	1	-	-
Bioassay, bioinformatics and R&D service industry	6	3	3	-
<input type="checkbox"/> Sales below break-even - 10 or more years				
Biopharmaceutical industry	28	7	21	-
Biochemical industry	12	9	3	-
Biofood industry	24	16	8	-
Bioenvironmental industry	6	6	-	-
Bioelectronics industry	1	1	-	-
Bioprocess and equipment industry	6	6	-	-
Bioassay, bioinformatics and R&D service industry	5	4	1	-
<input type="checkbox"/> Sales below break-even - Unknown				
Biofood industry	1	-	1	-
<input type="checkbox"/> Sales below break-even - 1 year				
Biofood industry	1	1	-	-
<input type="checkbox"/> Sales below break-even - 2~3 years				
Biopharmaceutical industry	6	-	6	-
Biochemical industry	3	2	1	-
Biofood industry	3	3	-	-
Bioenvironmental industry	1	1	-	-
Bioelectronics industry	1	1	-	-
Bioprocess and equipment industry	1	1	-	-
<input type="checkbox"/> Sales below break-even - 4~5 years				
Biopharmaceutical industry	9	3	6	-
Biochemical industry	11	7	4	-
Biofood industry	2	1	1	-
Bioenvironmental industry	1	-	1	-
Bioenergy and bioresource industry	2	1	1	-
Bioassay, bioinformatics and R&D service industry	2	2	-	-
<input type="checkbox"/> Sales above break-even - 6~9 years				
Biopharmaceutical industry	11	6	5	-
Biochemical industry	17	7	10	-
Biofood industry	14	10	4	-
Bioenvironmental industry	5	2	3	-
Bioelectronics industry	1	1	-	-
Bioprocess and equipment industry	6	5	1	-
Bioenergy and bioresource industry	1	-	1	-
Bioassay, bioinformatics and R&D service industry	3	3	-	-
<input type="checkbox"/> Sales above break-even - 10 or more years				
Biopharmaceutical industry	75	27	48	-
Biochemical industry	37	16	21	-
Biofood industry	36	12	24	-
Bioenvironmental industry	15	7	8	-
Bioelectronics industry	4	2	2	-
Bioprocess and equipment industry	16	9	6	1
Bioenergy and bioresource industry	4	-	4	-
Bioassay, bioinformatics and R&D service industry	14	8	6	-
<input type="checkbox"/> Sales - Unknown				
Biopharmaceutical industry	29	18	8	3
Biochemical industry	13	7	6	-
Biofood industry	2	2	-	-
Bioenvironmental industry	2	2	-	-
Bioprocess and equipment industry	4	1	3	-
Bioassay, bioinformatics and R&D service industry	2	2	-	-

<Table 1-3 > Distribution by Type of Company[Duplication](II-4-2)

(Unit : number of firms)

	Total	Venture companies	INNO-BIZ	Kosdaq-listed companies	Listed companies	Not applicable/Unknown
Number of companies	978	338	324	99	87	397
<input checked="" type="checkbox"/> Sales Situation						
No sales	281	78	76	20	36	123
Sales below break-even - 1 year	10	4	2	1	1	5
Sales below break-even - 2~3 years	63	23	15	2	3	31
Sales below break-even - 4~5 years	96	41	31	7	4	42
Sales below break-even - 6~9 years	91	40	37	8	5	31
Sales below break-even - 10 or more years	82	31	35	10	7	25
Sales below break-even - Unknown	1	1	1	-	-	-
Sales below break-even - 1 year	1	-	1	-	-	-
Sales below break-even - 2~3 years	15	6	2	1	1	7
Sales below break-even - 4~5 years	27	9	4	2	-	16
Sales above break-even - 6~9 years	58	32	29	8	4	14
Sales above break-even - 10 or more years	201	61	79	34	21	77
Sales - Unknown	52	12	12	6	5	26
<input checked="" type="checkbox"/> Main type of industry						
Biopharmaceutical industry	330	92	83	58	43	139
Biochemical industry	206	77	79	13	21	81
Biofood industry	197	64	63	12	18	78
Bioenvironmental industry	76	29	38	-	1	34
Bioelectronics industry	22	13	7	2	-	7
Bioprocess and equipment industry	71	26	30	7	1	32
Bioenergy and bioresource industry	26	10	6	2	3	10
Bioassay, bioinformatics and R&D service industry	50	27	18	5	-	16
<input type="checkbox"/> No sales						
Biopharmaceutical industry	101	25	20	12	14	44
Biochemical industry	47	13	17	1	8	18
Biofood industry	60	12	10	4	12	29
Bioenvironmental industry	23	9	13	-	-	9
Bioelectronics industry	7	1	2	-	-	5
Bioprocess and equipment industry	22	9	9	2	-	11
Bioenergy and bioresource industry	11	4	3	-	2	4
Bioassay, bioinformatics and R&D service industry	10	5	2	1	-	3
<input type="checkbox"/> Sales below break-even - 1 year						
Biopharmaceutical industry	5	1	1	1	1	3
Biofood industry	1	-	-	-	-	1
Bioenvironmental industry	1	1	1	-	-	-
Bioelectronics industry	1	1	-	-	-	-
Bioassay, bioinformatics and R&D service industry	2	1	-	-	-	1
<input type="checkbox"/> Sales below break-even - 2~3 years						
Biopharmaceutical industry	19	5	6	2	2	9
Biochemical industry	20	7	2	-	1	12
Biofood industry	10	4	4	-	-	4
Bioenvironmental industry	3	1	1	-	-	2
Bioelectronics industry	3	2	-	-	-	1
Bioprocess and equipment industry	4	1	2	-	-	2
Bioenergy and bioresource industry	3	2	-	-	-	1
Bioassay, bioinformatics and R&D service industry	1	1	-	-	-	-
<input type="checkbox"/> Sales below break-even - 4~5 years						
Biopharmaceutical industry	23	11	7	3	3	9
Biochemical industry	22	5	6	2	1	11
Biofood industry	19	9	6	-	-	9
Bioenvironmental industry	10	6	6	-	-	4
Bioelectronics industry	3	2	-	1	-	1
Bioprocess and equipment industry	10	5	3	-	-	4
Bioenergy and bioresource industry	4	1	1	-	-	3
Bioassay, bioinformatics and R&D service industry	5	2	2	1	-	1

	Total	Venture companies	INNO-BIZ	Kosdaq-listed companies	Listed companies	Not applicable/Unknown
Number of companies	978	338	324	99	87	397
<input type="checkbox"/> Sales below break-even - 6~9 years						
Biopharmaceutical industry	24	9	8	3	2	9
Biochemical industry	24	12	12	4	2	6
Biofood industry	24	11	7	-	1	9
Bioenvironmental industry	9	2	4	-	-	5
Bioelectronics industry	1	1	1	-	-	-
Bioprocess and equipment industry	2	1	2	1	-	-
Bioenergy and bioresource industry	1	1	1	-	-	-
Bioassay, bioinformatics and R&D service industry	6	3	2	-	-	2
<input type="checkbox"/> Sales below break-even - 10 or more years						
Biopharmaceutical industry	28	11	12	7	6	4
Biochemical industry	12	4	5	-	1	5
Biofood industry	24	9	13	2	-	6
Bioenvironmental industry	6	2	1	-	-	4
Bioelectronics industry	1	1	1	-	-	-
Bioprocess and equipment industry	6	1	2	-	-	4
Bioassay, bioinformatics and R&D service industry	5	3	1	1	-	2
<input type="checkbox"/> Sales below break-even - Unknown						
Biofood industry	1	1	1	-	-	-
<input type="checkbox"/> Sales below break-even - 1 year						
Biofood industry	1	-	1	-	-	-
<input type="checkbox"/> Sales below break-even - 2~3 years						
Biopharmaceutical industry	6	3	1	1	1	2
Biochemical industry	3	1	-	-	-	2
Biofood industry	3	1	-	-	-	2
Bioenvironmental industry	1	-	1	-	-	-
Bioelectronics industry	1	1	-	-	-	-
Bioprocess and equipment industry	1	-	-	-	-	1
<input type="checkbox"/> Sales below break-even - 4~5 years						
Biopharmaceutical industry	9	2	-	2	-	5
Biochemical industry	11	5	3	-	-	6
Biofood industry	2	-	-	-	-	2
Bioenvironmental industry	1	1	1	-	-	-
Bioenergy and bioresource industry	2	1	-	-	-	1
Bioassay, bioinformatics and R&D service industry	2	-	-	-	-	2
<input type="checkbox"/> Sales above break-even - 6~9 years						
Biopharmaceutical industry	11	3	2	4	1	5
Biochemical industry	17	12	12	1	2	2
Biofood industry	14	8	8	1	-	3
Bioenvironmental industry	5	1	2	-	1	2
Bioelectronics industry	1	1	-	-	-	-
Bioprocess and equipment industry	6	4	3	1	-	2
Bioenergy and bioresource industry	1	-	-	1	-	-
Bioassay, bioinformatics and R&D service industry	3	3	2	-	-	-
<input type="checkbox"/> Sales above break-even - 10 or more years						
Biopharmaceutical industry	75	15	19	18	13	34
Biochemical industry	37	17	20	5	2	12
Biofood industry	36	9	13	5	5	11
Bioenvironmental industry	15	6	8	-	-	6
Bioelectronics industry	4	3	3	1	-	-
Bioprocess and equipment industry	16	3	7	2	-	8
Bioenergy and bioresource industry	4	1	1	1	1	1
Bioassay, bioinformatics and R&D service industry	14	7	8	2	-	5
<input type="checkbox"/> Sales - Unknown						
Biopharmaceutical industry	29	7	7	5	-	15
Biochemical industry	13	1	2	-	4	7
Biofood industry	2	-	-	-	-	2
Bioenvironmental industry	2	-	-	-	-	2
Bioprocess and equipment industry	4	2	2	1	1	-
Bioassay, bioinformatics and R&D service industry	2	2	1	-	-	-

< Table 1-4 > Distribution by Establishment Year(I-6) (Unit : number of firms)

	Total	Before 1950	1951~1980	1981~1990	1991~1995	1996~2000	2001~2005	2006~2010	2011~2015	Unknown
Number of companies	978	14	137	105	78	274	214	121	29	6
<input type="checkbox"/> Sales Situation										
No sales	281	4	56	32	24	63	58	37	7	-
Sales below break-even - 1 year	10	1	-	2	-	4	1	-	1	1
Sales below break-even - 2~3 years	63	2	5	6	4	14	16	13	3	-
Sales below break-even - 4~5 years	96	1	3	9	1	36	19	20	7	-
Sales below break-even - 6~9 years	91	-	4	4	4	33	35	10	1	-
Sales below break-even - 10 or more years	82	1	8	11	7	36	17	1	1	-
Sales below break-even - Unknown	1	-	-	-	-	1	-	-	-	-
Sales below break-even - 1 year	1	-	-	-	-	-	1	-	-	-
Sales below break-even - 2~3 years	15	1	-	-	-	5	3	4	2	-
Sales below break-even - 4~5 years	27	-	5	2	-	5	4	10	1	-
Sales above break-even - 6~9 years	58	1	4	1	2	13	24	12	1	-
Sales above break-even - 10 or more years	201	3	45	32	25	54	33	6	3	-
Sales - Unknown	52	-	7	6	11	10	3	8	2	5
<input type="checkbox"/> Main type of industry										
Biopharmaceutical industry	330	11	63	51	31	79	50	29	13	3
Biochemical industry	206	2	25	16	10	62	45	38	6	2
Biofood industry	197	1	34	19	12	61	52	16	2	-
Bioenvironmental industry	76	-	8	7	5	21	31	3	-	1
Bioelectronics industry	22	-	-	-	2	8	6	5	1	-
Bioprocess and equipment industry	71	-	1	9	15	19	10	13	4	-
Bioenergy and bioresource industry	26	-	6	2	1	4	5	5	3	-
Bioassay, bioinformatics and R&D service industry	50	-	-	1	2	20	15	12	-	-
<input type="checkbox"/> No sales										
Biopharmaceutical industry	101	3	23	16	9	22	18	7	3	-
Biochemical industry	47	1	10	3	3	13	7	9	1	-
Biofood industry	60	-	18	8	4	13	13	4	-	-
Bioenvironmental industry	23	-	2	3	-	4	11	3	-	-
Bioelectronics industry	7	-	-	-	-	3	4	-	-	-
Bioprocess and equipment industry	22	-	-	1	6	5	1	7	2	-
Bioenergy and bioresource industry	11	-	3	1	-	1	2	3	1	-
Bioassay, bioinformatics and R&D service industry	10	-	-	-	2	2	2	4	-	-
<input type="checkbox"/> Sales below break-even - 1 year										
Biopharmaceutical industry	5	1	-	2	-	1	-	-	-	1
Biofood industry	1	-	-	-	-	1	-	-	-	-
Bioenvironmental industry	1	-	-	-	-	1	-	-	-	-
Bioelectronics industry	1	-	-	-	-	-	-	-	1	-
Bioassay, bioinformatics and R&D service industry	2	-	-	-	-	1	1	-	-	-
<input type="checkbox"/> Sales below break-even - 2~3 years										
Biopharmaceutical industry	19	1	2	3	-	6	5	1	1	-
Biochemical industry	20	1	1	1	1	4	3	7	2	-
Biofood industry	10	-	1	2	1	-	3	3	-	-
Bioenvironmental industry	3	-	-	-	-	1	2	-	-	-
Bioelectronics industry	3	-	-	-	1	-	-	2	-	-
Bioprocess and equipment industry	4	-	-	-	-	2	2	-	-	-
Bioenergy and bioresource industry	3	-	1	-	1	-	1	-	-	-
Bioassay, bioinformatics and R&D service industry	1	-	-	-	-	1	-	-	-	-
<input type="checkbox"/> Sales below break-even - 4~5 years										
Biopharmaceutical industry	23	1	1	2	1	7	3	6	2	-
Biochemical industry	22	-	1	3	-	7	4	5	2	-
Biofood industry	19	-	1	1	-	11	3	2	1	-
Bioenvironmental industry	10	-	-	1	-	4	5	-	-	-
Bioelectronics industry	3	-	-	-	-	1	1	1	-	-
Bioprocess and equipment industry	10	-	-	1	-	5	-	3	1	-
Bioenergy and bioresource industry	4	-	-	-	-	1	1	1	1	-
Bioassay, bioinformatics and R&D service industry	5	-	-	1	-	-	2	2	-	-

* In case establishment year has changed by takeover, merger or divestiture etc., sales period may start earlier than the year of establishment to maintain consistency with previous result.

	Total	Before 1950	1951~1980	1981~1990	1991~1995	1996~2000	2001~2005	2006~2010	2011~2015	Unknown
Number of companies	978	14	137	105	78	274	214	121	29	6
<input type="checkbox"/> Sales below break-even - 6~9 years										
Biopharmaceutical industry	24	-	2	2	1	11	5	3	-	-
Biochemical industry	24	-	-	-	-	11	10	3	-	-
Biofood industry	24	-	1	1	1	8	11	2	-	-
Bioenvironmental industry	9	-	1	-	2	1	5	-	-	-
Bioelectronics industry	1	-	-	-	-	1	-	-	-	-
Bioprocess and equipment industry	2	-	-	1	-	-	-	-	1	-
Bioenergy and bioresource industry	1	-	-	-	-	-	1	-	-	-
Bioassay, bioinformatics and R&D service industry	6	-	-	-	-	1	3	2	-	-
<input type="checkbox"/> Sales below break-even - 10 or more years										
Biopharmaceutical industry	28	1	5	6	1	9	5	-	1	-
Biochemical industry	12	-	1	-	1	8	2	-	-	-
Biofood industry	24	-	2	3	3	10	6	-	-	-
Bioenvironmental industry	6	-	-	1	-	4	1	-	-	-
Bioelectronics industry	1	-	-	-	-	1	-	-	-	-
Bioprocess and equipment industry	6	-	-	1	2	2	1	-	-	-
Bioassay, bioinformatics and R&D service industry	5	-	-	-	-	2	2	1	-	-
<input type="checkbox"/> Sales below break-even - Unknown										
Biofood industry	1	-	-	-	-	1	-	-	-	-
<input type="checkbox"/> Sales below break-even - 1 year										
Biofood industry	1	-	-	-	-	-	1	-	-	-
<input type="checkbox"/> Sales below break-even - 2~3 years										
Biopharmaceutical industry	6	1	-	-	-	2	1	1	1	-
Biochemical industry	3	-	-	-	-	1	-	1	1	-
Biofood industry	3	-	-	-	-	2	1	-	-	-
Bioenvironmental industry	1	-	-	-	-	-	-	1	-	-
Bioelectronics industry	1	-	-	-	-	-	-	1	-	-
Bioprocess and equipment industry	1	-	-	-	-	-	-	1	-	-
<input type="checkbox"/> Sales below break-even - 4~5 years										
Biopharmaceutical industry	9	-	3	1	-	2	-	3	-	-
Biochemical industry	11	-	2	1	-	2	3	3	-	-
Biofood industry	2	-	-	-	-	-	-	2	-	-
Bioenvironmental industry	1	-	-	-	-	-	-	1	-	-
Bioenergy and bioresource industry	2	-	-	-	-	1	-	-	1	-
Bioassay, bioinformatics and R&D service industry	2	-	-	-	-	-	-	2	-	-
<input type="checkbox"/> Sales above break-even - 6~9 years										
Biopharmaceutical industry	11	-	1	1	1	3	4	1	-	-
Biochemical industry	17	-	2	-	-	2	7	6	-	-
Biofood industry	14	1	-	-	-	4	6	2	1	-
Bioenvironmental industry	5	-	1	-	-	1	3	-	-	-
Bioelectronics industry	1	-	-	-	-	-	-	1	-	-
Bioprocess and equipment industry	6	-	-	-	1	1	3	1	-	-
Bioenergy and bioresource industry	1	-	-	-	-	-	-	1	-	-
Bioassay, bioinformatics and R&D service industry	3	-	-	-	-	2	1	-	-	-
<input type="checkbox"/> Sales above break-even - 10 or more years										
Biopharmaceutical industry	75	3	23	14	9	12	8	3	3	-
Biochemical industry	37	-	5	7	5	12	7	1	-	-
Biofood industry	36	-	11	4	3	9	8	1	-	-
Bioenvironmental industry	15	-	4	2	5	2	-	-	-	-
Bioelectronics industry	4	-	-	-	1	2	1	-	-	-
Bioprocess and equipment industry	16	-	-	4	5	4	3	-	-	-
Bioenergy and bioresource industry	4	-	2	1	-	1	-	-	-	-
Bioassay, bioinformatics and R&D service industry	14	-	-	-	-	9	4	1	-	-
<input type="checkbox"/> Sales - Unknown										
Biopharmaceutical industry	29	-	3	4	9	4	1	4	2	2
Biochemical industry	13	-	3	1	-	2	2	3	-	2
Biofood industry	2	-	-	-	-	2	-	-	-	-
Bioenvironmental industry	2	-	-	-	1	-	-	-	-	1
Bioprocess and equipment industry	4	-	1	1	1	-	-	1	-	-
Bioassay, bioinformatics and R&D service industry	2	-	-	-	-	2	-	-	-	-

* In case establishment year has changed by takeover, merger or divestiture etc., sales period may start earlier than the year of establishment to maintain consistency with previous result.

< Table 1-5 > Distribution by total number of workers' size(II-3) (Unit : number of firms, people)

Number of companies	Total	Less than 50	50~299	300~999	More than 1,000	Un-known	Average	CEO's gender			Employees' gender		
								Male	Female	Unknown	Male	Female	Unknown
Number of companies	978	574	272	75	46	11	377	870	87	21	258,329	77,275	21,018
<input type="checkbox"/> Sales Situation													
No sales	281	146	85	28	19	3	318	256	16	9	56,157	19,115	10,000
Sales below break-even - 1 year	10	5	4	1	-	-	94	9	1	-	480	272	191
Sales below break-even - 2~3 years	63	46	12	3	2	-	127	53	10	-	5,454	1,768	777
Sales below break-even - 4~5 years	96	77	17	1	1	-	69	87	9	-	4,854	1,425	244
Sales below break-even - 6~9 years	91	76	11	2	2	-	140	81	10	-	7,758	4,569	438
Sales below break-even - 10 or more years	82	57	16	6	3	-	125	76	6	-	7,069	3,116	30
Sales below break-even - Unknown	1	1	-	-	-	-	43	1	-	-	-	-	-
Sales above break-even - 1 year	1	1	-	-	-	-	6	1	-	-	3	3	-
Sales above break-even - 2~3 years	15	9	6	-	-	-	60	13	2	-	478	299	64
Sales above break-even - 4~5 years	27	22	3	2	-	-	77	21	6	-	1,524	552	6
Sales above break-even - 6~9 years	58	39	14	2	3	-	127	54	4	-	4,142	1,857	1,345
Sales above break-even - 10 or more years	201	75	89	24	13	-	586	182	19	-	95,775	17,286	4,695
Sales - Unknown	52	20	15	6	3	8	2,995	36	4	12	74,635	27,013	3,185
<input type="checkbox"/> Main type of industry													
Biopharmaceutical industry	330	126	133	48	17	6	235	299	24	7	45,803	17,595	11,184
Biochemical industry	206	143	39	8	14	2	1,112	180	20	6	174,525	39,141	3,201
Biofood industry	197	127	44	12	13	1	250	174	20	3	27,613	16,275	4,794
Bioenvironmental industry	76	60	13	1	1	1	65	69	6	1	3,398	746	723
Bioelectronics industry	22	15	5	2	-	-	95	18	3	1	903	551	449
Bioprocess and equipment industry	71	50	18	2	-	1	51	62	6	3	2,104	870	491
Bioenergy and bioresource industry	26	18	6	1	1	-	113	24	2	-	2,286	561	91
Bioassay, bioinformatics and R&D service industry	50	35	14	1	-	-	68	44	6	-	1,697	1,536	85
<input type="checkbox"/> No sales													
Biopharmaceutical industry	101	40	41	17	2	1	211	96	5	-	12,261	4,052	4,558
Biochemical industry	47	26	12	3	6	-	679	43	3	1	24,502	3,561	454
Biofood industry	60	25	17	7	10	1	535	54	3	3	16,277	10,828	3,923
Bioenvironmental industry	23	19	4	-	-	-	32	21	1	1	402	141	197
Bioelectronics industry	7	5	2	-	-	-	81	4	2	1	26	13	449
Bioprocess and equipment industry	22	17	4	-	-	1	40	18	1	3	342	160	297
Bioenergy and bioresource industry	11	7	3	-	1	-	178	10	1	-	1,637	234	85
Bioassay, bioinformatics and R&D service industry	10	7	2	1	-	-	97	10	-	-	710	126	37
<input type="checkbox"/> Sales below break-even - 1 year													
Biopharmaceutical industry	5	1	3	1	-	-	156	5	-	-	429	223	127
Biofood industry	1	-	1	-	-	-	64	1	-	-	-	-	-
Bioenvironmental industry	1	1	-	-	-	-	14	1	-	-	10	4	-
Bioelectronics industry	1	1	-	-	-	-	22	-	1	-	10	12	-
Bioassay, bioinformatics and R&D service industry	2	2	-	-	-	-	32	2	-	-	31	33	-
<input type="checkbox"/> Sales below break-even - 2~3 years													
Biopharmaceutical industry	19	9	7	1	2	-	296	17	2	-	4,299	1,329	4
Biochemical industry	20	16	3	1	-	-	66	17	3	-	846	304	173
Biofood industry	10	8	1	1	-	-	73	9	1	-	104	47	580
Bioenvironmental industry	3	3	-	-	-	-	9	1	2	-	15	13	-
Bioelectronics industry	3	3	-	-	-	-	25	3	-	-	45	31	-
Bioprocess and equipment industry	4	4	-	-	-	-	19	3	1	-	56	18	-
Bioenergy and bioresource industry	3	2	1	-	-	-	38	3	-	-	89	26	-
Bioassay, bioinformatics and R&D service industry	1	1	-	-	-	-	20	-	1	-	-	-	-
<input type="checkbox"/> Sales below break-even - 4~5 years													
Biopharmaceutical industry	23	15	8	-	-	-	49	22	1	-	649	422	53
Biochemical industry	22	19	1	1	1	-	177	20	2	-	2,938	563	37
Biofood industry	19	15	4	-	-	-	39	15	4	-	555	165	30
Bioenvironmental industry	10	9	1	-	-	-	18	9	1	-	65	19	98
Bioelectronics industry	3	1	2	-	-	-	110	3	-	-	268	62	-
Bioprocess and equipment industry	10	10	-	-	-	-	19	10	-	-	128	50	11
Bioenergy and bioresource industry	4	4	-	-	-	-	22	4	-	-	65		

	Total	Less than 50	50~299	300~999	More than 1,000	Un-known	Average	CEO's gender			Employees' gender		
								Male	Female	Unknown	Male	Female	Unknown
								870	87	21	258,329	77,275	21,018
Number of companies	978	574	272	75	46	11	377						
<input type="checkbox"/> Sales below break-even - 6~9 years													
Biopharmaceutical industry	24	17	5	2	-	-	98	22	2	-	1,660	574	125
Biochemical industry	24	21	1	-	2	-	386	22	2	-	5,449	3,761	46
Biofood industry	24	23	1	-	-	-	23	21	3	-	415	116	16
Bioenvironmental industry	9	7	2	-	-	-	37	9	-	-	76	16	242
Bioelectronics industry	1	1	-	-	-	-	13	1	-	-	10	3	-
Bioprocess and equipment industry	2	1	1	-	-	-	58	2	-	-	80	35	-
Bioenergy and bioresource industry	1	1	-	-	-	-	22	-	1	-	12	10	-
Bioassay, bioinformatics and R&D service industry	6	5	1	-	-	-	20	4	2	-	56	54	9
<input type="checkbox"/> Sales below break-even - 10 or more years													
Biopharmaceutical industry	28	12	8	5	3	-	298	25	3	-	5,901	2,421	30
Biochemical industry	12	11	1	-	-	-	18	12	-	-	140	80	-
Biofood industry	24	20	4	-	-	-	35	21	3	-	597	253	-
Bioenvironmental industry	6	5	1	-	-	-	18	6	-	-	90	15	-
Bioelectronics industry	1	-	-	1	-	-	334	1	-	-	160	174	-
Bioprocess and equipment industry	6	5	1	-	-	-	19	6	-	-	61	55	-
Bioassay, bioinformatics and R&D service industry	5	4	1	-	-	-	48	5	-	-	120	118	-
<input type="checkbox"/> Sales below break-even - Unknown													
Biofood industry	1	1	-	-	-	-	43	1	-	-	-	-	-
<input type="checkbox"/> Sales below break-even - 1 year													
Biofood industry	1	1	-	-	-	-	6	1	-	-	3	3	-
<input type="checkbox"/> Sales below break-even - 2~3 years													
Biopharmaceutical industry	6	1	5	-	-	-	109	6	-	-	347	242	64
Biochemical industry	3	3	-	-	-	-	24	3	-	-	56	15	-
Biofood industry	3	3	-	-	-	-	11	1	2	-	22	11	-
Bioenvironmental industry	1	-	1	-	-	-	74	1	-	-	47	27	-
Bioelectronics industry	1	1	-	-	-	-	1	1	-	-	-	-	-
Bioprocess and equipment industry	1	1	-	-	-	-	10	1	-	-	6	4	-
<input type="checkbox"/> Sales below break-even - 4~5 years													
Biopharmaceutical industry	9	6	2	1	-	-	89	8	1	-	482	322	-
Biochemical industry	11	9	1	1	-	-	105	8	3	-	973	177	-
Biofood industry	2	2	-	-	-	-	7	2	-	-	5	8	-
Bioenvironmental industry	1	1	-	-	-	-	18	-	1	-	15	3	-
Bioenergy and bioresource industry	2	2	-	-	-	-	24	2	-	-	37	4	6
Bioassay, bioinformatics and R&D service industry	2	2	-	-	-	-	25	1	1	-	12	38	-
<input type="checkbox"/> Sales above break-even - 6~9 years													
Biopharmaceutical industry	11	4	4	1	2	-	354	9	2	-	2,625	1,267	-
Biochemical industry	17	13	3	-	1	-	129	15	2	-	634	221	1,339
Biofood industry	14	12	2	-	-	-	22	14	-	-	180	115	6
Bioenvironmental industry	5	4	-	1	-	-	80	5	-	-	341	60	-
Bioelectronics industry	1	1	-	-	-	-	6	1	-	-	4	2	-
Bioprocess and equipment industry	6	2	4	-	-	-	57	6	-	-	217	127	-
Bioenergy and bioresource industry	1	1	-	-	-	-	40	1	-	-	37	3	-
Bioassay, bioinformatics and R&D service industry	3	2	1	-	-	-	55	3	-	-	104	62	-
<input type="checkbox"/> Sales above break-even - 10 or more years													
Biopharmaceutical industry	75	13	38	16	8	-	360	69	6	-	16,735	6,501	3,795
Biochemical industry	37	20	15	1	1	-	1,869	33	4	-	64,869	3,814	467
Biofood industry	36	15	14	4	3	-	398	32	4	-	9,454	4,729	130
Bioenvironmental industry	15	10	4	-	1	-	197	15	-	-	2,329	444	186
Bioelectronics industry	4	2	1	1	-	-	159	4	-	-	380	254	-
Bioprocess and equipment industry	16	8	7	1	-	-	96	12	4	-	1,124	301	117
Bioenergy and bioresource industry	4	1	2	1	-	-	168	4	-	-	409	262	-
Bioassay, bioinformatics and R&D service industry	14	6	8	-	-	-	104	13	1	-	475	981	-
<input type="checkbox"/> Sales - Unknown													
Biopharmaceutical industry	29	8	12	4	-	5	171	20	2	7	415	242	2,428
Biochemical industry	13	5	2	1	3	2	11,272	7	1	5	74,118	26,645	685
Biofood industry	2	2	-	-	-	-	2	2	-	-	1	-	-
Bioenvironmental industry	2	1	-	-	-	-	12	1	1	-	8	4	-
Bioprocess and equipment industry	4	2	1	1	-	-	92	4	-	-	90	120	66
Bioassay, bioinformatics and R&D service industry	2	2	-	-	-	-	5	2	-	-	3	2	4

< Table 1-6 > Size of Capital(II-1) (Unit : number of firms, million Won)

	Total	Capital			
		Number of respondent companies	Sum	Average	
Number of companies	978	823	12,612,142	15,325	
<input checked="" type="checkbox"/> Sales Situation					
No sales	281	226	3,808,191	16,850	
Sales below break-even - 1 year	10	10	130,130	13,013	
Sales below break-even - 2~3 years	63	56	1,107,515	19,777	
Sales below break-even - 4~5 years	96	81	333,293	4,115	
Sales below break-even - 6~9 years	91	76	435,271	5,727	
Sales below break-even - 10 or more years	82	68	411,602	6,053	
Sales below break-even - Unknown	1	1	1,940	1,940	
Sales below break-even - 1 year	1	1	100	100	
Sales below break-even - 2~3 years	15	10	68,941	6,894	
Sales below break-even - 4~5 years	27	23	195,531	8,501	
Sales above break-even - 6~9 years	58	51	947,477	18,578	
Sales above break-even - 10 or more years	201	186	3,726,309	20,034	
Sales - Unknown	52	34	1,445,842	42,525	
<input checked="" type="checkbox"/> Main type of industry					
Biopharmaceutical industry	330	291	4,028,265	13,843	
Biochemical industry	206	167	5,917,787	35,436	
Biofood industry	197	157	1,987,827	12,661	
Bioenvironmental industry	76	69	95,138	1,379	
Bioelectronics industry	22	15	42,414	2,828	
Bioprocess and equipment industry	71	58	132,050	2,277	
Bioenergy and bioresource industry	26	22	319,371	14,517	
Bioassay, bioinformatics and R&D service industry	50	44	89,289	2,029	
<input checked="" type="checkbox"/> Number of employees					
Less than 50	574	452	716,485	1,585	
50~299	272	257	2,115,155	8,230	
300~999	75	67	1,262,895	18,849	
More than 1,000	46	46	8,517,576	185,165	
Unknown	11	1	30	30	
<input type="checkbox"/> Sales situation - No sales					
Biopharmaceutical industry					
	Less than 50	40	29	103,583	3,572
	50~299	41	39	212,391	5,446
	300~999	17	16	321,907	20,119
	More than 1,000	2	2	290,718	145,359
	Unknown	1	-	-	-
Biochemical industry					
	Less than 50	26	17	31,492	1,852
	50~299	12	11	58,588	5,326
	300~999	3	1	31,506	31,506
	More than 1,000	6	6	1,448,447	241,408
Biofood industry					
	Less than 50	25	17	21,284	1,252
	50~299	17	14	127,460	9,104
	300~999	7	5	108,242	21,648
	More than 1,000	10	10	741,909	74,191
	Unknown	1	-	-	-
Bioenvironmental industry					
	Less than 50	19	16	15,323	958
	50~299	4	4	11,790	2,948
Bioelectronics industry					
	Less than 50	5	3	6,478	2,159
	50~299	2	1	6,958	6,958
Bioprocess and equipment industry					
	Less than 50	17	13	14,113	1,086
	50~299	4	4	50,784	12,696
	Unknown	1	-	-	-
Bioenergy and bioresource industry					
	Less than 50	7	5	4,173	835
	50~299	3	3	20,820	6,940
	More than 1,000	1	1	167,456	167,456
Bioassay, bioinformatics and R&D service industry					
	Less than 50	7	6	861	144
	50~299	2	2	9,908	4,954
	300~999	1	1	2,000	2,000
<input type="checkbox"/> Sales below break-even - 1 year					
Biopharmaceutical industry					
	Less than 50	1	1	2,252	2,252
	50~299	3	3	94,232	31,411
	300~999	1	1	23,334	23,334

	Total	Capital		
		Number of respondent companies	Sum	Average
Number of companies	978	823	12,612,142	15,325
Biofood industry	1	1	2,000	2,000
Bioenvironmental industry	1	1	176	176
Bioelectronics industry	1	1	1,038	1,038
Bioassay, bioinformatics and R&D service industry	2	2	7,098	3,549
□ Sales below break-even - 2~3 years				
Biopharmaceutical industry	9	8	23,110	2,889
Less than 50	7	7	20,745	2,964
50~299	1	1	48,728	48,728
300~999	2	2	953,160	476,580
More than 1,000	16	12	13,878	1,157
Biochemical industry	3	3	6,668	2,223
Less than 50	1	1	10,550	10,550
Biofood industry	8	7	2,450	350
Less than 50	1	1	1,090	1,090
50~299	1	1	9,100	9,100
300~999	3	3	652	217
Bioenvironmental industry	3	3	8,255	2,752
Bioelectronics industry	4	3	2,300	767
Bioprocess and equipment industry	2	2	2,944	1,472
Bioenergy and bioresource industry	1	1	3,325	3,325
Bioassay, bioinformatics and R&D service industry	1	1	560	560
□ Sales below break-even - 4~5 years				
Biopharmaceutical industry	15	12	38,130	3,178
Less than 50	8	8	55,780	6,973
Biochemical industry	19	14	7,553	540
Less than 50	1	1	3,150	3,150
50~299	1	1	20,000	20,000
300~999	1	1	127,247	127,247
More than 1,000	15	12	13,843	1,154
Biofood industry	4	3	15,363	5,121
Bioenvironmental industry	9	9	7,451	828
Less than 50	1	1	3,121	3,121
50~299	1	-	-	-
Bioelectronics industry	2	1	3,419	3,419
Less than 50	10	10	9,185	919
Bioprocess and equipment industry	4	4	13,929	3,482
Bioenergy and bioresource industry	4	4	1,212	404
Bioassay, bioinformatics and R&D service industry	1	1	13,908	13,908
□ Sales below break-even - 6~9 years				
Biopharmaceutical industry	17	14	34,532	2,467
Less than 50	5	5	28,447	5,689
50~299	2	2	76,466	38,233
300~999	21	19	26,331	1,386
Biochemical industry	1	1	13,117	13,117
Less than 50	2	2	169,346	84,673
More than 1,000	23	16	37,251	2,328
Biofood industry	1	1	22,459	22,459
Bioenvironmental industry	7	5	3,126	625
Less than 50	2	2	2,817	1,409
50~299	1	-	-	-
Bioelectronics industry	1	1	120	120
Bioprocess and equipment industry	1	1	12,169	12,169
Less than 50	1	1	1,322	1,322
Bioenergy and bioresource industry	5	5	3,488	698
Bioassay, bioinformatics and R&D service industry	1	1	4,280	4,280
□ Sales below break-even - 10 or more years				
Biopharmaceutical industry	12	10	16,266	1,627
Less than 50	8	8	81,564	10,196
50~299	5	5	67,260	13,452
300~999	3	3	127,689	42,563
More than 1,000	11	7	29,932	4,276
Biochemical industry	1	1	2,266	2,266
Less than 50	20	17	23,200	1,365
Biofood industry	4	4	34,213	8,553

	Total	Capital			
		Number of respondent companies	Sum	Average	
Number of companies	978	823	12,612,142	15,325	
Bioprocess and equipment industry	5	4	1,570	393	
Less than 50	1	-	-	-	
Bioassay, bioinformatics and R&D service industry	4	3	12,132	4,044	
Less than 50	1	1	7,212	7,212	
50~299	1	1	1,940	1,940	
□ Sales below break-even - Unknown					
Biopharmaceutical industry	1	1	100	100	
□ Sales below break-even - 1 year					
Biopharmaceutical industry	1	1	100	100	
□ Sales below break-even - 2~3 years					
Biopharmaceutical industry	1	1	2,417	2,417	
Less than 50	5	5	59,274	11,855	
Biochemical industry	3	3	7,150	2,383	
Less than 50	3	-	-	-	
Biofood industry	1	1	100	100	
Bioenvironmental industry	1	-	-	-	
Bioelectronics industry	1	-	-	-	
Bioprocess and equipment industry	1	-	-	-	
□ Sales below break-even - 4~5 years					
Biopharmaceutical industry	6	6	16,332	2,722	
Less than 50	2	2	63,206	31,603	
50~299	1	1	15,535	15,535	
300~999	9	7	4,465	638	
Biochemical industry	1	1	2,900	2,900	
Less than 50	1	1	89,463	89,463	
300~999	2	2	480	240	
Biofood industry	1	1	300	300	
Bioenvironmental industry	2	1	2,800	2,800	
Bioenergy and bioresource industry	2	1	50	50	
Bioassay, bioinformatics and R&D service industry	2	1	50	50	
□ Sales above break-even - 6~9 years					
Biopharmaceutical industry	4	3	3,753	1,251	
Less than 50	4	3	8,872	2,957	
50~299	1	1	5,334	5,334	
300~999	2	2	248,034	124,017	
More than 1,000	13	12	14,384	1,199	
Biochemical industry	3	3	38,761	12,920	
Less than 50	1	1	576,000	576,000	
More than 1,000	12	10	6,249	625	
Biofood industry	2	2	9,292	4,646	
Bioenvironmental industry	4	4	6,489	1,622	
Less than 50	1	1	10,846	10,846	
300~999	1	1	225	225	
Bioelectronics industry	2	1	600	600	
Bioprocess and equipment industry	4	4	4,985	1,246	
Less than 50	1	1	9,672	9,672	
Bioenergy and bioresource industry	2	1	1,841	1,841	
Bioassay, bioinformatics and R&D service industry	1	1	2,140	2,140	
Less than 50	1	1	2,140	2,140	
50~299	□ Sales above break-even - 10 or more years				
Biopharmaceutical industry	13	11	10,314	938	
Less than 50	38	38	346,117	9,108	
50~299	16	15	238,619	15,908	
300~999	8	8	267,723	33,465	
More than 1,000	20	17	22,155	1,303	
Biochemical industry	15	14	338,456	24,175	
Less than 50	1	1	11,953	11,953	
50~299	1	1	1,500,000	1,500,000	
300~999	15	12	15,349	1,279	
More than 1,000	14	13	84,047	6,465	
Biofood industry	4	4	85,434	21,359	
Less than 50	3	3	625,071	208,357	
50~299					
300~999					
More than 1,000					

		Total	Capital		
			Number of respondent companies	Sum	Average
Number of companies		978	823	12,612,142	15,325
Bioenvironmental industry	Less than 50	10	10	9,533	953
	50~299	4	4	17,731	4,433
	More than 1,000	1	1	596	596
Bioelectronics industry	Less than 50	2	2	1,395	698
	50~299	1	1	3,391	3,391
	300~999	1	1	6,857	6,857
Bioprocess and equipment industry	Less than 50	8	6	2,076	346
	50~299	7	7	12,012	1,716
	300~999	1	1	14,000	14,000
Bioenergy and bioresource industry	Less than 50	1	-	-	-
	50~299	2	2	85,780	42,890
	300~999	1	1	7,150	7,150
Bioassay, bioinformatics and R&D service industry	Less than 50	6	5	3,650	730
	50~299	8	8	16,900	2,112
<input type="checkbox"/> Sales - Unknown					
Biopharmaceutical industry	Less than 50	8	5	6,341	1,268
	50~299	12	11	83,208	7,564
	300~999	4	3	32,891	10,964
	Unknown	5	-	-	-
Biochemical industry	Less than 50	5	3	15,968	5,323
	50~299	2	1	560	560
	300~999	1	1	21,322	21,322
	More than 1,000	3	3	1,274,180	424,727
	Unknown	2	-	-	-
Biofood industry	Less than 50	2	-	-	-
Bioenvironmental industry	Less than 50	1	1	1,157	1,157
	Unknown	1	1	30	30
Bioprocess and equipment industry	Less than 50	2	2	3,756	1,878
	50~299	1	1	4,380	4,380
	300~999	1	-	-	-
Bioassay, bioinformatics and R&D service industry	Less than 50	2	2	2,049	1,024

< Table 1-7 > Ratio of Net Worth(II-2)

(Unit : number of firms, %)

		Total	Ratio of Net worth	
			Number of respondent companies	Average
Number of companies		978	748	54
<input checked="" type="checkbox"/> Sales Situation				
No sales		281	203	53
Sales below break-even - 1 year		10	10	235
Sales below break-even - 2~3 years		63	49	47
Sales below break-even - 4~5 years		96	70	40
Sales below break-even - 6~9 years		91	66	45
Sales below break-even - 10 or more years		82	62	38
Sales below break-even - Unknown		1	1	20
Sales below break-even - 1 year		1	1	38
Sales below break-even - 2~3 years		15	10	55
Sales below break-even - 4~5 years		27	18	50
Sales above break-even - 6~9 years		58	48	62
Sales above break-even - 10 or more years		201	178	60
Sales - Unknown		52	32	57
<input checked="" type="checkbox"/> Main type of industry				
Biopharmaceutical industry		330	272	62
Biochemical industry		206	153	48
Biofood industry		197	137	51
Bioenvironmental industry		76	61	55
Bioelectronics industry		22	12	58
Bioprocess and equipment industry		71	51	51
Bioenergy and bioresource industry		26	22	38
Bioassay, bioinformatics and R&D service industry		50	40	51
<input checked="" type="checkbox"/> Number of employees				
Less than 50		574	381	51
50~299		272	253	57
300~999		75	67	62
More than 1,000		46	46	59
Unknown		11	1	95
<input type="checkbox"/> Sales situation - No sales				
Biopharmaceutical industry	Less than 50	40	24	48
	50~299	41	38	52
	300~999	17	16	59
	More than 1,000	2	2	52
	Unknown	1	-	-
Biochemical industry	Less than 50	26	12	56
	50~299	12	11	54
	300~999	3	1	59
	More than 1,000	6	6	67
Biofood industry	Less than 50	25	13	63
	50~299	17	13	52
	300~999	7	5	58
	More than 1,000	10	10	65
	Unknown	1	-	-
Bioenvironmental industry	Less than 50	19	14	54
	50~299	4	4	38
Bioelectronics industry	Less than 50	5	1	68
	50~299	2	1	24
Bioprocess and equipment industry	Less than 50	17	11	40
	50~299	4	4	75
	Unknown	1	-	-
Bioenergy and bioresource industry	Less than 50	7	5	14
	50~299	3	2	49
	More than 1,000	1	1	39
Bioassay, bioinformatics and R&D service industry	Less than 50	7	6	52
	50~299	2	2	65
	300~999	1	1	100
<input type="checkbox"/> Sales below break-even - 1 year				
Biopharmaceutical industry	Less than 50	1	1	1,782
	50~299	3	3	76
	300~999	1	1	65

	Total	Ratio of Net worth	
		Number of respondent companies	Average
Number of companies	978	748	54
Biofood industry	1	1	30
Bioenvironmental industry	1	1	43
Bioelectronics industry	1	1	78
Bioassay, bioinformatics and R&D service industry	2	2	60
<input type="checkbox"/> Sales below break-even - 2~3 years			
Biopharmaceutical industry	9	6	48
50~299	7	7	50
300~999	1	1	48
More than 1,000	2	2	51
Biochemical industry	16	10	42
50~299	3	3	50
300~999	1	1	67
Biofood industry	8	6	51
50~299	1	1	74
300~999	1	1	57
Bioenvironmental industry	3	1	57
Bioelectronics industry	3	3	51
Bioprocess and equipment industry	4	3	43
Bioenergy and bioresource industry	2	2	38
50~299	1	1	-83
Bioassay, bioinformatics and R&D service industry	1	1	94
<input type="checkbox"/> Sales below break-even - 4~5 years			
Biopharmaceutical industry	15	11	54
50~299	8	8	42
Biochemical industry	19	14	8
50~299	1	1	75
300~999	1	1	66
More than 1,000	1	1	54
Biofood industry	15	8	47
50~299	4	3	49
Bioenvironmental industry	9	6	58
50~299	1	1	52
Bioelectronics industry	1	-	-
50~299	2	1	51
Bioprocess and equipment industry	10	8	45
Bioenergy and bioresource industry	4	4	48
Bioassay, bioinformatics and R&D service industry	4	2	-12
50~299	1	1	65
<input type="checkbox"/> Sales below break-even - 6~9 years			
Biopharmaceutical industry	17	11	31
50~299	5	5	50
300~999	2	2	54
Biochemical industry	21	18	48
50~299	1	1	73
More than 1,000	2	2	72
Biofood industry	23	14	45
50~299	1	1	38
Bioenvironmental industry	7	4	35
50~299	2	2	42
Bioelectronics industry	1	-	-
Less than 50	1	-	-
Bioprocess and equipment industry	1	1	54
50~299	1	1	84
Bioenergy and bioresource industry	1	1	32
Bioassay, bioinformatics and R&D service industry	5	2	51
50~299	1	1	54
<input type="checkbox"/> Sales below break-even - 10 or more years			
Biopharmaceutical industry	12	8	51
50~299	8	8	56
300~999	5	5	74
More than 1,000	3	3	51
Biochemical industry	11	5	-58
50~299	1	1	69
Biofood industry	20	16	31
50~299	4	4	50
Bioenvironmental industry	5	3	39
50~299	1	1	58
Bioelectronics industry	1	1	69

	Total	Ratio of Net worth	
		Number of respondent companies	Average
Number of companies	978	748	54
Bioprocess and equipment industry	5	3	61
50~299	1	-	-
Bioassay, bioinformatics and R&D service industry	4	3	3
50~299	1	1	53
<input type="checkbox"/> Sales below break-even - Unknown			
Biofood industry	1	1	20
<input type="checkbox"/> Sales below break-even - 1 year			
Biofood industry	1	1	38
<input type="checkbox"/> Sales below break-even - 2~3 years			
Biopharmaceutical industry	1	1	32
50~299	5	5	70
Biochemical industry	3	3	32
Biofood industry	3	-	-
Bioenvironmental industry	1	1	75
Bioelectronics industry	1	-	-
Bioprocess and equipment industry	1	-	-
<input type="checkbox"/> Sales below break-even - 4~5 years			
Biopharmaceutical industry	6	4	60
50~299	2	2	23
300~999	1	1	82
Biochemical industry	9	6	43
50~299	1	1	80
300~999	1	1	28
Biofood industry	2	-	-
Bioenvironmental industry	1	1	45
Bioenergy and bioresource industry	2	1	31
Bioassay, bioinformatics and R&D service industry	2	1	95
<input type="checkbox"/> Sales above break-even - 6~9 years			
Biopharmaceutical industry	4	3	55
50~299	4	3	75
300~999	1	1	27
More than 1,000	2	2	59
Biochemical industry	13	12	64
50~299	3	3	44
More than 1,000	1	1	60
Biofood industry	12	8	57
50~299	2	2	66
Bioenvironmental industry	4	4	75
300~999	1	1	65
Bioelectronics industry	1	-	-
Bioprocess and equipment industry	2	1	86
50~299	4	4	62
Bioenergy and bioresource industry	1	1	50
Bioassay, bioinformatics and R&D service industry	2	1	60
50~299	1	1	70
<input type="checkbox"/> Sales above break-even - 10 or more years			
Biopharmaceutical industry	13	10	58
50~299	38	38	65
300~999	16	15	65
More than 1,000	8	8	58
Biochemical industry	20	14	63
50~299	15	14	70
300~999	1	1	63
More than 1,000	1	1	74
Biofood industry	15	9	44
50~299	14	13	60
300~999	4	4	45
More than 1,000	3	3	51

Number of companies	Total	Ratio of Net worth	
		Number of respondent companies	Average
	978	748	54
Bioenvironmental industry			
Less than 50	10	10	61
50~299	4	4	70
More than 1,000	1	1	54
Bioelectronics industry			
Less than 50	2	2	43
50~299	1	1	91
300~999	1	1	79
Bioprocess and equipment industry			
Less than 50	8	4	41
50~299	7	7	54
300~999	1	1	36
Bioenergy and bioresource industry			
Less than 50	1	1	73
50~299	2	2	84
300~999	1	1	82
Bioassay, bioinformatics and R&D service industry			
Less than 50	6	5	68
50~299	8	8	39
<input type="checkbox"/> Sales - Unknown			
Biopharmaceutical industry			
Less than 50	8	4	62
50~299	12	10	58
300~999	4	3	73
Unknown	5	-	-
Biochemical industry			
Less than 50	5	3	32
50~299	2	1	44
300~999	1	1	41
More than 1,000	3	3	56
Unknown	2	-	-
Biofood industry			
Less than 50	2	-	-
Bioenvironmental industry			
Less than 50	1	1	42
Unknown	1	1	95
Bioprocess and equipment industry			
Less than 50	2	2	19
50~299	1	1	87
300~999	1	-	-
Bioassay, bioinformatics and R&D service industry			
Less than 50	2	2	80

< Table 2 > Manpower Status of Bioindustry
 < Table 2-1 > Manpower Size of Researchers(III-2) (Unit : number of firms, people)

Number of companies	Total	Bioindustry Workers		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total	
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
	978	39,686	41	1,797	2	5,864	6	4,053	4	1,068	1	12,782	13
<input checked="" type="checkbox"/> Sales Situation													
No sales	281	5,826	21	353	1	1,124	4	823	3	177	1	2,477	9
Sales below break-even - 1 year	10	311	31	27	3	87	10	57	6	1	0	172	17
Sales below break-even - 2~3 years	63	2,536	40	83	1	268	4	146	2	49	1	546	9
Sales below break-even - 4~5 years	96	2,008	21	125	1	328	3	254	3	57	1	764	8
Sales below break-even - 6~9 years	91	2,107	23	129	1	290	3	197	2	84	1	700	8
Sales below break-even - 10 or more years	82	4,196	51	220	3	751	9	373	5	81	1	1,425	17
Sales below break-even - Unknown	1	43	43	3	3	14	14	8	8	2	2	27	27
Sales below break-even - 1 year	1	6	6	1	1	-	-	-	-	2	2	3	3
Sales below break-even - 2~3 years	15	466	31	18	1	59	4	42	3	6	0	125	8
Sales below break-even - 4~5 years	27	897	33	46	2	126	5	133	5	7	0	312	12
Sales above break-even - 6~9 years	58	2,860	49	121	2	418	7	322	6	143	2	1,004	17
Sales above break-even - 10 or more years	201	18,151	90	634	3	2,328	12	1,610	8	450	2	5,022	25
Sales - Unknown	52	279	5	37	1	71	2	88	3	9	0	205	4
<input checked="" type="checkbox"/> Main type of industry													
Biopharmaceutical industry	330	20,818	63	929	3	3,002	10	1,700	6	526	2	6,157	19
Biochemical industry	206	5,015	24	307	2	1,105	6	637	3	119	1	2,168	11
Biofood industry	197	6,519	33	264	1	818	4	478	2	99	1	1,659	8
Bioenvironmental industry	76	1,214	16	35	0	135	2	160	2	20	0	357	5
Bioelectronics industry	22	1,185	54	32	2	126	6	125	6	27	1	303	14
Bioprocess and equipment industry	71	1,514	21	50	1	152	2	187	3	39	1	428	6
Bioenergy and bioresource industry	26	1,149	44	48	2	107	4	95	4	121	5	371	14
Bioassay, bioinformatics and R&D service industry	50	2,272	45	132	3	419	9	671	14	117	2	1,339	27
<input checked="" type="checkbox"/> Number of employees													
Less than 50	574	7,205	13	496	1	1,166	2	1,034	2	159	0	2,855	5
50~299	272	17,085	63	528	2	1,807	7	1,880	7	379	1	4,594	17
300~999	75	5,435	72	254	4	946	14	509	8	206	3	1,915	26
More than 1,000	46	9,961	217	519	11	1,945	42	630	14	324	7	3,418	74
Unknown	11	-	-	-	-	-	-	-	-	-	-	-	-
<input type="checkbox"/> Sales situation - No sales													
Biopharmaceutical industry													
Less than 50	40	479	12	31	1	86	2	90	2	17	0	224	6
50~299	41	779	19	29	1	96	2	138	3	25	1	288	7
300~999	17	1,179	69	111	7	363	21	222	13	35	2	731	43
More than 1,000	2	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	1	-	-	-	-	-	-	-	-	-	-	-	-
Biochemical industry													
Less than 50	26	216	8	8	0	27	1	29	1	5	0	69	3
50~299	12	438	37	12	1	40	4	37	3	12	1	101	8
300~999	3	3	1	1	1	2	2	-	-	-	-	3	1
More than 1,000	6	160	27	54	9	71	12	20	3	10	2	155	26
Biofood industry													
Less than 50	25	208	8	13	1	34	1	30	1	1	0	78	3
50~299	17	560	33	16	1	49	3	66	4	22	1	153	9
300~999	7	451	64	12	2	59	8	31	4	13	2	115	16
More than 1,000	10	413	41	23	2	166	17	33	3	8	1	230	23
Unknown	1	-	-	-	-	-	-	-	-	-	-	-	-
Bioenvironmental industry													
Less than 50	19	94	5	4	0	15	1	13	1	3	0	35	2
50~299	4	199	50	3	1	7	2	16	4	3	1	29	7
Bioelectronics industry													
Less than 50	5	28	6	4	1	8	2	12	3	1	0	25	5
50~299	2	18	9	1	1	7	4	5	3	-	-	13	7
Bioprocess and equipment industry													
Less than 50	17	166	10	3	0	18	1	26	2	9	1	56	3
50~299	4	81	20	4	1	15	4	11	3	3	1	33	8
Unknown	1	-	-	-	-	-	-	-	-	-	-	-	-
Bioenergy and bioresource industry													
Less than 50	7	56	8	2	0	6	1	13	2	5	1	26	4
50~299	3	87	29	-	-	6	2	14	5	-	-	20	7
More than 1,000	1	76	76	10	10	20	20	6	6	5	5	41	41
Bioassay, bioinformatics and R&D service industry													
Less than 50	7	14	2	1	0	5	1	7	1	-	-	13	2
50~299	2	99	50	4	2	13	7	3	2	-	-	20	10
300~999	1	22	22	7	7	11	11	1	1	-	-	19	19

	Total	Bioindustry		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total	
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
		Workers	Doctor	Master	Bachelor	Others	Total						
Number of companies	978	39,686	41	1,797	2	5,864	6	4,053	4	1,068	1	12,782	13
☐ Sales below break-even - 1 year													
Bio pharmaceutical industry													
Less than 50	1	9	9	-	-	4	4	5	5	-	-	9	9
50-299	3	108	36	4	2	10	5	24	12	1	1	39	13
300-999	1	66	66	13	13	47	47	6	6	-	-	66	66
Biofood industry													
Less than 50	1	28	28	1	1	5	5	5	5	-	-	11	11
Bioenvironmental industry													
Less than 50	1	14	14	-	-	7	7	-	-	-	-	7	7
Bioelectronics industry													
Less than 50	1	22	22	3	3	6	6	-	-	-	-	9	9
Bioassay, bioinformatics and R&D service industry													
Less than 50	2	64	32	6	3	8	4	17	9	-	-	31	16
☐ Sales below break-even - 2-3 years													
Bio pharmaceutical industry													
Less than 50	9	131	15	12	1	44	5	9	1	-	-	65	7
50-299	7	485	69	8	1	27	4	14	2	7	1	56	8
300-999	1	21	21	2	2	8	8	-	-	-	-	10	10
More than 1,000	2	1,185	593	20	10	38	19	10	5	10	5	78	39
Biochemical industry													
Less than 50	16	105	7	6	0	24	2	20	1	2	0	52	3
50-299	3	42	14	4	1	8	3	16	5	5	2	33	11
300-999	1	180	180	3	3	44	44	17	17	7	7	71	71
Biofood industry													
Less than 50	8	72	9	4	1	15	2	10	1	3	0	32	4
50-299	1	27	27	-	-	4	4	4	4	1	1	9	9
300-999	1	30	30	2	2	21	21	6	6	1	1	30	30
Bioenvironmental industry													
Less than 50	3	16	5	-	-	2	1	4	1	2	1	8	3
Bioelectronics industry													
Less than 50	3	76	25	6	2	13	4	11	4	4	1	34	11
Bioprocess and equipment industry													
Less than 50	4	57	14	10	3	1	0	3	1	3	1	17	4
Bioenergy and bioresource industry													
Less than 50	2	53	27	4	2	9	5	15	8	2	1	30	15
50-299	1	50	50	1	1	8	8	6	6	2	2	17	17
Bioassay, bioinformatics and R&D service industry													
Less than 50	1	6	6	1	1	2	2	1	1	-	-	4	4
☐ Sales below break-even - 4-5 years													
Bio pharmaceutical industry													
Less than 50	15	286	19	30	2	60	4	20	1	8	1	118	8
50-299	8	457	57	14	2	62	8	73	9	15	2	164	21
Biochemical industry													
Less than 50	19	240	13	10	1	29	2	46	3	7	0	92	5
50-299	1	33	33	1	1	9	9	2	2	-	-	12	12
300-999	1	53	53	4	4	22	22	11	11	-	-	37	37
More than 1,000	1	30	30	2	2	6	6	2	2	2	2	12	12
Biofood industry													
Less than 50	15	132	9	13	1	28	2	25	2	1	0	67	4
50-299	4	259	65	8	2	17	4	12	3	5	1	42	11
Bioenvironmental industry													
Less than 50	9	71	8	4	0	16	2	11	1	5	1	36	4
50-299	1	24	24	3	3	5	5	-	-	-	-	8	8
Bioelectronics industry													
Less than 50	1	7	7	1	1	2	2	2	2	-	-	5	5
50-299	2	50	25	4	2	14	7	14	7	4	2	36	18
Bioprocess and equipment industry													
Less than 50	10	164	16	7	1	17	2	23	2	4	0	51	5
Bioenergy and bioresource industry													
Less than 50	4	47	12	2	1	3	1	1	0	5	1	11	3
Bioassay, bioinformatics and R&D service industry													
Less than 50	4	67	17	13	3	25	6	9	2	1	0	48	12
50-299	1	88	88	9	9	13	13	3	3	-	-	25	25
☐ Sales below break-even - 6-9 years													
Bio pharmaceutical industry													
Less than 50	17	292	17	40	2	76	4	29	2	5	0	150	9
50-299	5	406	81	4	1	19	5	33	8	58	12	114	23
300-999	2	20	10	-	-	-	-	-	-	-	-	-	-
Biochemical industry													
Less than 50	21	286	14	21	1	46	2	45	2	7	0	119	6
50-299	1	215	215	7	7	40	40	4	4	5	5	56	56
More than 1,000	2	51	26	13	7	20	10	2	1	1	1	36	18
Biofood industry													
Less than 50	23	241	10	19	1	28	1	25	1	5	0	77	3
50-299	1	102	102	2	2	4	4	2	2	-	-	8	8
Bioenvironmental industry													
Less than 50	7	32	5	3	0	9	1	6	1	-	-	18	3
50-299	2	237	119	1	1	3	2	6	3	2	1	12	6
Bioelectronics industry													
Less than 50	1	13	13	1	1	2	2	4	4	-	-	7	7
Bioprocess and equipment industry													
Less than 50	1	8	8	-	-	1	1	1	1	1	1	3	3
50-299	1	107	107	4	4	14	14	24	24	-	-	42	42
Bioenergy and bioresource industry													
Less than 50	1	22	22	2	2	6	6	10	10	-	-	18	18
Bioassay, bioinformatics and R&D service industry													
Less than 50	5	37	7	5	1	10	2	4	1	-	-	19	4
50-299	1	38	38	7	7	12	12	2	2	-	-	21	21

	Total	Bioindustry		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total	
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
		Workers	Doctor	Master	Bachelor	Others	Total						
Number of companies	978	39,686	41	1,797	2	5,864	6	4,053	4	1,068	1	12,782	13
☐ Sales below break-even - 10 or more years													
Bio pharmaceutical industry													
Less than 50	12	268	22	27	2	52	4	49	4	5	0	133	11
50-299	8	563	70	66	8	120	15	42	5	5	1	233	29
300-999	5	155	31	13	3	46	9	21	4	6	1	86	17
More than 1,000	3	1,538	513	73	24	331	110	75	25	24	8	503	168
Biochemical industry													
Less than 50	11	94	9	7	1	14	1	13	1	1	0	35	3
50-299	1	77	77	2	2	15	15	8	8	-	-	25	25
Biofood industry													
Less than 50	20	294	15	15	1	35	2	26	1	1	0	77	4
50-299	4	422	106	2	1	30	8	19	5	-	-	51	13
Bioenvironmental industry													
Less than 50	5	28	6	-	-	6	1	3	1	-	-	9	2
50-299	1	73	73	-	-	2	2	8	8	-	-	10	10
Bioelectronics industry													
300-999	1	334	334	2	2	31	31	31	31	1	1	65	65
Bioprocess and equipment industry													
Less than 50	5	59	12	1	0	5	1	7	1	1	0	14	3
50-299	1	53	53	-	-	7	7	2	2	-	-	9	9
Bioassay, bioinformatics and R&D service industry													
Less than 50	4	55	14	5	1	14	4	5	1	1	0	25	6
50-299	1	183	183	7	7	43	43	64	64	36	36	150	150
☐ Sales below break-even - Unknown													
Biofood industry													
Less than 50	1	43	43	3	3	14	14	8	8	2	2	27	27
☐ Sales below break-even - 1 year													
Biofood industry				</									

	Total	Bioindustry Workers		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total		
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	
Number of companies	978	39,686	41	1,797	2	5,864	6	4,053	4	1,068	1	12,782	13	
<input type="checkbox"/> Sales above break-even - 10 or more years														
Biopharmaceutical industry	Less than 50	13	328	25	14	1	30	2	50	4	4	0	98	8
	50-299	38	4,528	119	122	3	411	11	214	6	45	1	792	21
	300-999	16	931	58	27	2	108	8	58	4	24	2	217	14
	More than 1,000	8	3,777	472	148	19	538	67	158	20	144	18	988	124
Biochemical industry	Less than 50	20	303	15	12	1	47	2	34	2	4	0	97	5
	50-299	15	1,200	80	27	2	140	9	133	9	16	1	316	21
	300-999	1	42	42	3	3	29	29	7	3	3	3	42	42
	More than 1,000	1	475	475	45	45	330	330	85	85	15	15	475	475
Biofood industry	Less than 50	15	258	17	16	1	24	2	32	2	3	0	75	5
	50-299	14	1,307	93	25	2	76	5	80	6	3	0	184	13
	300-999	4	710	178	7	2	16	4	21	5	4	1	48	12
	More than 1,000	3	645	215	65	22	154	51	7	2	22	7	248	83
Bioenvironmental industry	Less than 50	10	130	13	9	1	16	2	23	2	1	0	49	5
	50-299	4	79	20	3	1	9	2	10	3	9	2	31	8
	More than 1,000	1	96	96	2	2	30	30	43	43	-	-	75	75
Bioelectronics industry	Less than 50	2	20	10	2	1	4	2	3	2	-	-	9	5
	50-299	1	92	92	1	1	5	5	4	4	-	-	10	10
	300-999	1	519	519	6	6	31	31	39	39	10	10	86	86
Bioprocess and equipment industry	Less than 50	8	233	29	5	1	19	2	11	1	9	1	44	6
	50-299	7	398	57	10	1	33	5	47	7	6	1	96	14
	300-999	1	2	2	-	-	-	-	2	2	-	-	2	2
Bioenergy and bioresource industry	Less than 50	1	26	26	3	3	5	5	2	2	1	1	11	11
	50-299	2	212	106	7	4	8	4	5	3	4	4	24	12
	300-999	1	433	433	16	16	33	33	16	16	94	94	159	159
Bioassay, bioinformatics and R&D service industry	Less than 50	6	93	16	11	2	21	4	22	4	3	1	57	10
	50-299	8	1,314	164	48	6	211	26	504	63	26	3	789	99
<input type="checkbox"/> Sales - Unknown														
Biopharmaceutical industry	Less than 50	8	40	5	2	1	4	1	3	1	-	-	9	1
	50-299	12	160	13	20	3	46	8	60	10	3	1	129	11
	300-999	4	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown	5	-	-	-	-	-	-	-	-	-	-	-	-
Biochemical industry	Less than 50	5	26	5	3	1	5	1	12	2	-	-	20	4
	50-299	2	-	-	-	-	-	-	-	-	-	-	-	-
	300-999	1	8	8	-	-	2	2	-	-	3	3	5	5
	More than 1,000	3	22	7	8	3	10	3	1	0	3	1	22	7
	Unknown	2	-	-	-	-	-	-	-	-	-	-	-	-
Biofood industry	Less than 50	2	1	1	1	1	-	-	-	-	-	-	1	1
Bioenvironmental industry	Less than 50	1	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	Less than 50	2	12	6	2	1	3	2	5	3	-	-	10	5
	50-299	1	5	5	-	-	-	-	5	5	-	-	5	5
	300-999	1	-	-	-	-	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	Less than 50	2	5	3	1	1	1	1	2	1	-	-	4	2

< Table 2-2 > Manpower Size of Production Workers (Unit : number of firms, people)

	Total	Bioindustry Workers		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total		
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	
Number of companies	978	39,686	41	133	0	1,009	1	4,491	5	7,931	9	13,564	14	
<input checked="" type="checkbox"/> Sales Situation														
No sales	281	5,826	21	26	0	139	1	845	3	1,063	4	2,073	7	
Sales below break-even - 1 year	10	311	31	1	0	5	1	26	3	28	3	60	6	
Sales below break-even - 2~3 years	63	2,536	40	25	0	132	2	471	7	480	8	1,108	18	
Sales below break-even - 4~5 years	96	2,008	21	6	0	65	1	231	2	414	4	716	7	
Sales below break-even - 6~9 years	91	2,107	23	15	0	66	1	228	3	233	3	542	6	
Sales below break-even - 10 or more years	82	4,196	51	13	0	71	1	434	5	789	10	1,307	16	
Sales below break-even - Unknown	1	43	43	1	1	3	3	7	7	5	5	16	16	
Sales below break-even - 1 year	1	6	6	-	-	-	-	1	1	-	-	1	1	
Sales below break-even - 2~3 years	15	466	31	10	1	10	1	34	2	42	3	96	6	
Sales below break-even - 4~5 years	27	897	33	1	0	30	1	208	8	93	3	332	12	
Sales below break-even - 6~9 years	58	2,860	49	7	0	134	2	344	6	665	11	1,150	20	
Sales above break-even - 10 or more years	201	18,151	90	28	0	352	2	1,656	8	4,111	21	6,147	31	
Sales - Unknown	52	279	5	-	-	2	0	6	0	8	0	16	0	
<input checked="" type="checkbox"/> Main type of industry														
Biopharmaceutical industry	330	20,818	63	73	0	711	2	2,380	8	3,983	13	7,147	22	
Biochemical industry	206	5,015	24	8	0	63	0	538	3	844	4	1,453	7	
Biofood industry	197	6,519	33	31	0	128	1	988	5	1,882	10	3,029	15	
Bioenvironmental industry	176	1,214	16	4	0	16	0	198	3	151	2	369	5	
Bioelectronics industry	22	1,185	54	1	0	17	1	97	5	461	23	576	26	
Bioprocess and equipment industry	71	1,514	21	12	0	36	1	130	2	332	5	510	7	
Bioenergy and bioresource industry	26	1,149	44	3	0	19	1	117	5	270	10	409	16	
Bioassay, bioinformatics and R&D service industry	50	2,272	45	1	0	19	0	43	1	8	0	71	1	
<input checked="" type="checkbox"/> Number of employees														
Less than 50	574	7,205	13	51	0	143	0	847	2	1,078	2	2,119	4	
50-299	272	17,085	63	38	0	381	1	1,791	7	3,892	15	6,102	22	
300-999	75	5,435	72	10	0	120	2	780	12	994	15	1,904	25	
More than 1,000	46	9,961	217	34	1	365	8	1,073	23	1,967	43	3,439	75	
Unknown	11	-	-	-	-	-	-	-	-	-	-	-	-	
<input type="checkbox"/> Sales situation - No sales														
Biopharmaceutical industry	Less than 50	40	479	12	-	-	6	0	41	1	61	2	108	3
	50-299	41	779	19	-	-	7	0	105	3	181	5	293	7
	300-999	17	1,179	69	1	0	19	1	39	2	93	5	152	9
	More than 1,000	2	-	-	-	-	-	-	-	-	-	-	-	
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	
Biochemical industry	Less than 50	26	216	8	-	-	5	0	23	1	61	3	89	3
	50-299	12	438	37	1	0	6	1	45	4	153	14	205	17
	300-999	3	3	1	-	-	-	-	-	-	-	-	-	
	More than 1,000	6	160	27	-	-	-	-	-	-	5	1	5	1
Biofood industry	Less than 50	25	208	8	16	1	4	0	19	1	28	1	67	3
	50-299	17	560	33	1	0	25	2	88	6	162	10	276	16
	300-999	7	451	64	3	0	16	2	232	33	85	12	336	48
	More than 1,000	10	413	41	3	0	23	2	56	6	100	10	182	18
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	
Bioenvironmental industry	Less than 50	19	94	5	-	-	2	0	7	0	24	1	33	2
	50-299	4	199	50	-	-	3	1	84	21	38	10	125	31
Bioelectronics industry	Less than 50	5	28	6	-	-	-	1	0	-	-	-	1	0
	50-299	2	18	9	-	-	2	1	3	2	-	-	5	3
Bioprocess and equipment industry	Less than 50	17	166	10	-	-	6	0	28	2	22	1	56	3
	50-299	4	81	20	-	-	3	1	9	2	19	5	31	8
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	
Bioenergy and bioresource industry	Less than 50	7	56	8	-	-	2	0	7	1	11	2	20	3
	50-299	3	87	29	-	-	-	43	14	-	-	43	14	
	More than 1,000	1	76	76	1	1	5	5	10	19	19	35	35	
Bioassay, bioinformatics and R&D service industry	Less than 50	7	14	2	-	-	-	-	-					

	Total	Bioindustry Workers		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total			
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average		
Number of companies	978	39,686	41	133	0	1,009	1	4,491	5	7,931	9	13,564	14		
<input type="checkbox"/> Sales above break-even - 10 or more years															
Bio pharmaceutical industry	Less than 50	13	328	25	-	1	0	5	0	43	3	37	3	86	7
	50-299	38	4,528	119	-	13	0	153	4	484	13	1,306	35	1,956	51
	300-999	16	931	58	-	4	0	25	2	169	12	174	12	372	23
	More than 1,000	8	3,777	472	-	6	1	87	11	289	36	630	79	1,012	127
Biochemical industry	Less than 50	20	303	15	-	-	-	6	0	34	2	47	2	87	4
	50-299	15	1,200	80	-	3	0	16	1	88	6	276	18	383	26
	300-999	1	42	42	-	-	-	-	-	-	-	-	-	-	-
	More than 1,000	1	475	475	-	-	-	-	-	-	-	-	-	-	-
Biofood industry	Less than 50	15	258	17	-	-	-	2	0	21	1	94	6	117	8
	50-299	14	1,307	93	-	-	33	2	176	13	512	37	721	52	
	300-999	4	710	178	-	-	4	1	62	16	116	29	182	46	
	More than 1,000	3	645	215	-	-	-	-	100	33	245	82	345	115	
Bioenvironmental industry	Less than 50	10	130	13	-	-	1	0	20	2	11	1	32	3	
	50-299	4	79	20	-	0	3	1	18	5	24	6	46	12	
	300-999	1	96	96	-	-	-	-	21	21	-	-	21	21	
Bioelectronics industry	Less than 50	2	20	10	-	-	-	3	2	-	-	-	3	2	
	50-299	1	92	92	-	-	1	1	8	8	55	55	64	64	
	300-999	1	519	519	-	-	7	7	55	55	270	270	332	332	
Bioprocess and equipment industry	Less than 50	8	233	29	-	-	3	0	6	1	60	8	69	9	
	50-299	7	398	57	-	-	-	-	28	4	73	10	101	14	
	300-999	1	2	2	-	-	-	-	-	-	-	-	-	-	
Bioenergy and bioresource industry	Less than 50	1	26	26	-	-	-	-	5	5	3	3	8	8	
	50-299	2	212	106	-	-	2	1	-	-	110	55	112	56	
	300-999	1	433	433	-	-	4	4	16	16	68	68	88	88	
Bioassay, bioinformatics and R&D service industry	Less than 50	6	93	16	-	-	-	-	10	2	-	-	10	2	
	50-299	8	1,314	164	-	-	-	-	-	-	-	-	-	-	
<input type="checkbox"/> Sales - Unknown															
Bio pharmaceutical industry	Less than 50	8	40	5	-	-	2	1	5	2	5	2	12	2	
	50-299	12	160	13	-	-	-	-	-	-	-	-	-	-	
	300-999	4	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown	5	-	-	-	-	-	-	-	-	-	-	-	-	
Biochemical industry	Less than 50	5	26	5	-	-	-	-	-	1	0	1	0		
	50-299	2	-	-	-	-	-	-	-	-	-	-	-		
	300-999	1	8	8	-	-	-	-	1	1	2	2	3		
	More than 1,000	3	22	7	-	-	-	-	-	-	-	-	-		
	Unknown	2	-	-	-	-	-	-	-	-	-	-	-		
Biofood industry	Less than 50	2	1	1	-	-	-	-	-	-	-	-	-		
Bioenvironmental industry	Less than 50	1	-	-	-	-	-	-	-	-	-	-	-		
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-		
Bioprocess and equipment industry	Less than 50	2	12	6	-	-	-	-	-	-	-	-	-		
	50-299	1	5	5	-	-	-	-	-	-	-	-	-		
	300-999	1	-	-	-	-	-	-	-	-	-	-	-		
Bioassay, bioinformatics and R&D service industry	Less than 50	2	5	3	-	-	-	-	-	-	-	-	-		

< Table 2-3 > Manpower Size of Others such as sales/administrative(III-2)

(Unit : number of firms, people)

	Total	Bioindustry Workers		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total		
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	
Number of companies	978	39,686	41	412	0	1,267	1	8,174	9	3,487	4	13,340	14	
<input checked="" type="checkbox"/> Sales Situation														
No sales	281	5,826	21	21	0	84	0	854	3	317	1	1,276	5	
Sales below break-even - 1 year	10	311	31	3	0	2	0	63	7	11	1	79	8	
Sales below break-even - 2~3 years	63	2,536	40	16	0	94	1	529	8	243	4	882	14	
Sales below break-even - 4~5 years	96	2,008	21	22	0	54	1	373	4	79	1	528	6	
Sales below break-even - 6~9 years	91	2,107	23	31	0	98	1	554	6	182	2	865	10	
Sales below break-even - 10 or more years	82	4,196	51	68	1	126	2	1,014	12	256	3	1,464	18	
Sales below break-even - Unknown	1	43	43	-	-	-	-	-	-	-	-	-	-	
Sales below break-even - 1 year	1	6	6	1	1	-	-	-	-	1	1	2	2	
Sales below break-even - 2~3 years	15	466	31	100	7	22	2	92	7	31	2	245	16	
Sales below break-even - 4~5 years	27	897	33	8	0	24	1	193	7	28	1	253	9	
Sales above break-even - 6~9 years	58	2,860	49	14	0	59	1	493	9	140	2	706	12	
Sales above break-even - 10 or more years	201	18,151	90	128	1	703	4	3,962	20	2,189	11	6,982	35	
Sales - Unknown	52	279	5	-	-	1	0	47	1	10	0	58	1	
<input checked="" type="checkbox"/> Main type of industry														
Bio pharmaceutical industry	330	20,818	63	250	1	623	2	4,578	15	2,063	7	7,514	23	
Biochemical industry	206	5,015	24	30	0	153	1	951	5	260	1	1,394	7	
Biofood industry	197	6,519	33	46	0	185	1	995	5	605	3	1,831	9	
Bioenvironmental industry	76	1,214	16	4	0	30	0	350	5	104	1	488	6	
Bioelectronics industry	22	1,185	54	14	1	42	2	191	10	59	3	306	14	
Bioprocess and equipment industry	71	1,514	21	16	0	50	1	339	5	171	3	576	8	
Bioenergy and bioresource industry	26	1,149	44	10	0	31	1	226	9	102	4	369	14	
Bioassay, bioinformatics and R&D service industry	50	2,272	45	42	1	153	3	544	11	123	3	862	17	
<input checked="" type="checkbox"/> Number of employees														
Less than 50	574	7,205	13	104	0	238	0	1,486	3	403	1	2,231	4	
50-299	272	17,085	63	223	1	625	2	3,990	16	1,551	6	6,389	23	
300-999	75	5,435	72	38	1	153	2	1,111	17	314	5	1,616	22	
More than 1,000	46	9,961	217	47	1	251	5	1,587	35	1,219	27	3,104	67	
Unknown	11	-	-	-	-	-	-	-	-	-	-	-	-	
<input type="checkbox"/> Sales situation - No sales														
Bio pharmaceutical industry	Less than 50	40	479	12	9	0	11	0	96	3	31	1	147	4
	50-299	41	779	19	2	0	12	0	148	4	36	1	198	5
	300-999	17	1,179	69	8	0	24	1	230	14	34	2	296	17
	More than 1,000	2	-	-	-	-	-	-	-	-	-	-	-	
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	
Biochemical industry	Less than 50	26	216	8	-	-	2	0	33	1	23	1	58	2
	50-299	12	438	37	1	0	8	1	105	10	18	2	132	11
	300-999	3	3	1	-	-	-	-	-	-	-	-	-	
	More than 1,000	6	160	27	-	-	-	-	-	-	-	-	-	
Biofood industry	Less than 50	25	208	8	-	-	10	0	50	2	3	0	63	3
	50-299	17	560	33	-	-	1	0	19	1	111	7	131	8
	300-999	7	451	64	-	-	-	-	-	-	-	-	-	
	More than 1,000	10	413	41	-	-	-	-	-	-	1	0	1	
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	
Bioenvironmental industry	Less than 50	19	94	5	-	-	-	-	13	1	13	1	26	1
	50-299	4	199	50	-	-	1	0	33	8	11	3	45	11
Bioelectronics industry	Less than 50	5	28	6	-	-	-	-	2	1	-	-	2	0
	50-299	2	18	9	-	-	-	-	-	-	-	-	-	
Bioprocess and equipment industry	Less than 50	17	166	10	1	0	5	0	33	2	15	1	54	3
	50-299	4	81	20	-	-	-	-	-	17	4	17	4	
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	
Bioenergy and bioresource industry	Less than 50	7	56	8	-	-	2	0	6	1	2	0	10	1
	50-299	3	87	29	-	-	-	24	8	-	-	-	24	8
	More than 1,000	1	76	76	-	-	-	-	-	-	-	-	-	
Bioassay, bioinformatics and R&D service industry	Less than 50	7	14	2	-	-	-	1	0	-	-	-	1	0
	50-299	2	99	50	-	-	8	4	58	29	2	1	68	34
	300-999	1	22	22	-	-	-	-	3	-	-	-	3	

		Total	Bioindustry		Researcher: Doctor		Researcher: Master		Researcher: Bachelor		Researcher: Others		Researcher: Total	
			Workers	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
Number of companies		978	39,686	41	412	0	1,267	1	8,174	9	3,487	4	13,340	14
□ Sales below break-even - 1 year														
Biopharmaceutical industry	Less than 50	1	9	9	-	-	-	-	-	-	-	-	-	-
	50~299	3	108	36	-	-	-	-	23	12	10	5	33	11
	300~999	1	66	66	-	-	-	-	-	-	-	-	-	-
Biofood industry	50~299	1	28	28	-	-	-	-	-	-	-	-	-	-
Bioenvironmental industry	Less than 50	1	14	14	-	-	1	1	-	-	1	1	2	2
Bioelectronics industry	Less than 50	1	22	22	-	-	-	-	10	10	-	-	11	11
Bioassay, bioinformatics and R&D service industry	Less than 50	2	64	32	3	2	-	-	30	15	-	-	33	17
□ Sales below break-even - 2~3 years														
Biopharmaceutical industry	Less than 50	9	131	15	-	-	4	0	24	3	2	0	30	3
	50~299	7	485	69	-	-	-	-	150	21	32	5	182	26
	300~999	1	21	21	-	-	-	-	-	-	-	-	-	-
	More than 1,000	2	1,185	593	8	4	79	40	259	130	193	97	539	270
Biochemical industry	Less than 50	16	105	7	1	0	1	0	22	1	2	0	26	2
	50~299	3	42	14	-	-	-	-	-	-	-	-	-	-
	300~999	1	180	180	-	-	-	-	17	17	-	-	17	17
Biofood industry	Less than 50	8	72	9	-	-	6	1	22	3	4	1	32	4
	50~299	1	27	27	-	-	-	-	2	2	-	-	2	2
	300~999	1	30	30	-	-	-	-	-	-	-	-	-	-
Bioenvironmental industry	Less than 50	3	16	5	1	0	-	-	2	1	1	0	4	1
Bioelectronics industry	Less than 50	3	76	25	1	0	3	1	18	6	1	0	23	8
Bioprocess and equipment industry	Less than 50	4	57	14	5	1	-	-	-	-	-	-	5	1
Bioenergy and bioresource industry	Less than 50	2	53	27	-	-	-	-	7	4	-	-	7	4
	50~299	1	50	50	-	-	1	1	6	6	8	8	15	15
Bioassay, bioinformatics and R&D service industry	Less than 50	1	6	6	-	-	-	-	-	-	-	-	-	-
□ Sales below break-even - 4~5 years														
Biopharmaceutical industry	Less than 50	15	286	19	9	1	9	1	41	3	5	0	64	4
	50~299	8	457	57	1	0	15	2	127	18	32	5	175	22
Biochemical industry	Less than 50	19	240	13	3	0	3	0	54	3	10	1	70	4
	50~299	1	33	33	-	-	-	-	-	-	-	-	-	-
	300~999	1	53	53	-	-	-	-	-	-	-	-	-	-
	More than 1,000	1	30	30	-	-	-	-	-	-	-	-	-	-
Biofood industry	Less than 50	15	132	9	1	0	1	0	18	1	8	1	28	2
	50~299	4	259	65	1	0	4	1	48	12	12	3	65	16
Bioenvironmental industry	Less than 50	9	71	8	-	-	-	-	2	0	-	-	2	0
	50~299	1	24	24	-	-	-	-	3	3	-	-	3	3
Bioelectronics industry	Less than 50	1	7	7	-	-	-	-	1	1	-	-	1	1
	50~299	2	50	25	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	Less than 50	10	164	16	1	0	-	-	44	4	10	1	55	6
Bioenergy and bioresource industry	Less than 50	4	47	12	-	-	-	-	8	2	1	0	9	2
Bioassay, bioinformatics and R&D service industry	Less than 50	4	67	17	-	-	2	1	10	3	1	0	13	3
	50~299	1	88	88	6	6	20	20	17	17	-	-	43	43
□ Sales below break-even - 6~9 years														
Biopharmaceutical industry	Less than 50	17	292	17	7	0	8	0	48	3	12	1	75	4
	50~299	5	406	81	3	1	24	6	135	34	28	7	190	38
	300~999	2	20	10	-	-	1	1	2	2	-	-	3	2
Biochemical industry	Less than 50	21	286	14	5	0	6	0	63	3	19	1	93	4
	50~299	1	215	215	7	7	27	27	36	36	64	64	134	134
	More than 1,000	2	51	26	-	-	-	-	-	-	-	-	-	-
Biofood industry	Less than 50	23	241	10	5	0	12	1	63	3	16	1	96	4
	50~299	1	102	102	-	-	-	-	9	9	-	-	9	9
Bioenvironmental industry	Less than 50	7	32	5	-	-	3	0	2	0	2	0	7	1
	50~299	2	237	119	1	1	8	4	164	82	39	20	212	106
Bioelectronics industry	Less than 50	1	13	13	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	Less than 50	1	8	8	-	-	-	-	1	1	1	1	2	2
	50~299	1	107	107	2	2	3	3	13	13	1	1	19	19
Bioenergy and bioresource industry	Less than 50	1	22	22	-	-	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	Less than 50	5	37	7	-	-	5	1	13	3	-	-	18	4
	50~299	1	38	38	1	1	1	1	5	5	-	-	7	7

		Total	Bioindustry		Others: Doctor		Others: Master		Others: Bachelor		Others: Others		Others: Total	
			Workers	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
Number of companies		978	39,686	41	412	0	1,267	1	8,174	9	3,487	4	13,340	14
□ Sales below break-even - 10 or more years														
Biopharmaceutical industry	Less than 50	12	268	22	7	1	6	1	40	3	13	1	66	6
	50~299	8	563	70	13	2	19	2	123	15	32	4	187	23
	300~999	5	155	31	2	0	4	1	5	1	-	-	11	2
	More than 1,000	3	1,538	513	26	9	40	13	441	147	29	10	536	179
Biochemical industry	Less than 50	11	94	9	2	0	3	0	17	2	6	1	28	3
	50~299	1	77	77	-	-	-	-	7	7	-	-	7	7
Biofood industry	Less than 50	20	294	15	9	0	10	1	45	2	25	1	89	4
	50~299	4	422	106	2	1	16	4	112	28	91	23	221	55
Bioenvironmental industry	Less than 50	5	28	6	1	0	3	1	6	1	5	1	15	3
	50~299	1	73	73	-	-	-	-	63	63	-	-	63	63
Bioelectronics industry	300~999	1	334	334	4	4	17	17	82	82	37	37	140	140
Bioprocess and equipment industry	Less than 50	5	59	12	-	-	2	0	23	5	4	1	29	6
	50~299	1	53	53	1	1	-	-	16	16	4	4	21	21
Bioassay, bioinformatics and R&D service industry	Less than 50	4	55	14	-	-	2	1	12	3	4	1	18	5
	50~299	1	183	183	1	1	4	4	22	22	6	6	33	33
□ Sales below break-even - Unknown														
Biofood industry	Less than 50	1	43	43	-	-	-	-	-	-	-	-	-	-
□ Sales below break-even - 1 year														
Biofood industry	Less than 50	1	6	6	1	1	-	-	-	-	1	1	2	2
□ Sales below break-even - 2~3 years														
Biopharmaceutical industry	Less than 50	1	38	38	-	-	1	1	12	12	2	2	15	15
	50~299	5	333	67	100	20	13	3	61	12	18	4	192	38
Biochemical industry	Less than 50	3	29	10	-	-	-	-	4	1	1	0	5	2
Biofood industry	Less than 50	3	16	5	-	-	1	0	7	2	1	0	9	3
Bioenvironmental industry	50~299	1	41	41	-	-	-	-	8	8	9	9	17	17
Bioelectronics industry	Less than 50	1	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	Less than 50	1	9	9	-	-	7	7	-	-	-	-	7	7
□ Sales below break-even - 4~5 years														
Biopharmaceutical industry	Less than 50	6	93	16	1	0	2	0	15	3	3	1	21	4
	50~299	2	245	123	2	1	5	3	82	41	7	4	96	48
	300~999	1	149	149	1	1	5	5	8	8	1	1	15	15
Biochemical industry	Less than 50	9	117	13	2	0	6	1	25	3	12	1	45	5
	50~299	1	74	74	-	-	3	3	30	30	3	3	36	36
	300~999	1	91	91	-	-	-	-	-	-	-	-	-	-
Biofood industry	Less than 50	2	13	7	-	-	-	-	2	1	-	-	2	1
Bioenvironmental industry	Less than 50	1	18	18	-	-	-	-	9	9	-	-	9	9
Bioenergy and bioresource industry	Less than 50	2	47	24	-	-	1	1	16	8	2	1	19	10
Bioassay, bioinformatics and R&D service industry	Less than 50	2	50	25	2	1	2	1	6	3	-	-	10	5
□ Sales above break-even - 6~9 years														
Biopharmaceutical industry	Less than 50	4	58	15	-	-	2	1	13	3	5	1	20	5
	50~299	4	206	52	2	1	5	1	92	23	13	3	112	28
	300~999	1	29	29	-	-	-	-	21	21	1	1	22	22
	More than 1,000	2	1,476	738	5	3	30	15	131	66	30	15	196	98
Biochemical industry	Less than 50	13	292	22	2	0								

	Total	Bioindustry Workers		Others: Doctor		Others: Master		Others: Bachelor		Others: Others		Others: Total		
		Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	
Number of companies	978	39,686	41	412	0	1,267	1	8,174	9	3,487	4	13,340	14	
<input type="checkbox"/> Sales above break-even - 10 or more years														
Biopharmaceutical industry	Less than 50	13	328	25	5	0	11	1	112	9	16	1	144	11
	50-299	38	4,528	119	33	1	184	5	1,063	29	500	14	1,780	47
	300-999	16	931	58	3	0	20	1	299	21	20	1	342	21
	More than 1,000	8	3,777	472	3	0	88	11	735	92	951	119	1,777	222
Biochemical industry	Less than 50	20	303	15	2	0	18	1	79	4	20	1	119	6
	50-299	15	1,200	80	5	0	67	4	358	24	71	5	501	33
	300-999	1	42	42	-	-	-	-	-	-	-	-	-	-
	More than 1,000	1	475	475	-	-	-	-	-	-	-	-	-	-
Biofood industry	Less than 50	15	258	17	8	1	11	1	34	2	13	1	66	4
	50-299	14	1,307	93	5	0	47	3	232	17	118	8	402	29
	300-999	4	710	178	6	2	45	11	250	63	179	45	480	120
	More than 1,000	3	645	215	5	2	14	5	18	6	15	5	52	17
Bioenvironmental industry	Less than 50	10	130	13	1	0	13	1	24	2	11	1	49	5
	50-299	4	79	20	-	-	-	-	-	-	2	1	2	1
	More than 1,000	1	96	96	-	-	-	-	-	-	-	-	-	-
Bioelectronics industry	Less than 50	2	20	10	-	-	2	1	3	2	3	2	8	4
	50-299	1	92	92	1	1	4	4	9	9	4	4	18	18
	300-999	1	519	519	8	8	15	15	64	64	14	14	101	101
Bioprocess and equipment industry	Less than 50	8	233	29	4	1	25	3	58	7	33	4	120	15
	50-299	7	398	57	1	0	4	1	111	16	85	12	201	29
	300-999	1	2	2	-	-	-	-	-	-	-	-	-	-
Bioenergy and bioresource industry	Less than 50	1	26	26	1	1	-	-	4	4	2	2	7	7
	50-299	2	212	106	3	2	5	3	13	7	55	28	76	38
	300-999	1	433	433	6	6	22	22	130	130	28	28	186	186
Bioassay, bioinformatics and R&D service industry	Less than 50	6	93	16	2	0	1	0	20	3	3	1	26	4
	50-299	8	1,314	164	26	3	107	13	346	43	46	6	525	66
<input type="checkbox"/> Sales - Unknown														
Biopharmaceutical industry	Less than 50	8	40	5	-	-	-	-	12	4	7	2	19	2
	50-299	12	160	13	-	-	1	0	30	5	-	-	31	3
	300-999	4	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown	5	-	-	-	-	-	-	-	-	-	-	-	-
Biochemical industry	Less than 50	5	26	5	-	-	-	-	2	0	3	1	5	1
	50-299	2	-	-	-	-	-	-	-	-	-	-	-	-
	300-999	1	8	8	-	-	-	-	-	-	-	-	-	-
	More than 1,000	3	22	7	-	-	-	-	-	-	-	-	-	-
	Unknown	2	-	-	-	-	-	-	-	-	-	-	-	-
Biofood industry	Less than 50	2	1	1	-	-	-	-	-	-	-	-	-	-
Bioenvironmental industry	Less than 50	1	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown	1	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry	Less than 50	2	12	6	-	-	-	-	2	1	-	-	2	1
	50-299	1	5	5	-	-	-	-	-	-	-	-	-	-
	300-999	1	-	-	-	-	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry	Less than 50	2	5	3	-	-	-	-	1	1	-	-	1	1

< Table 3 > Investment Status of Bioindustry (Unit : number of firms, million Won)

	Total	Total R&D Investment		R&D Investment in Bioindustry		Total Facility Investment		Facility Investment in Bioindustry		
		Total	Average	Total	Average	Total	Average	Total	Average	
Number of companies	978	4,884,873	4,995	1,312,560	1,342	776,933	794	411,962	421	
<input checked="" type="checkbox"/> Sales Situation										
No sales	281	674,243	2,399	235,598	838	225,176	801	18,665	66	
Sales below break-even - 1 year	10	28,410	2,841	17,550	1,755	5,923	592	3,846	385	
Sales below break-even - 2~3 years	63	118,609	1,883	68,112	1,081	241,180	3,828	228,176	3,622	
Sales below break-even - 4~5 years	96	55,976	583	35,914	374	29,988	312	11,851	123	
Sales below break-even - 6~9 years	91	150,938	1,659	73,116	803	30,679	337	5,770	63	
Sales below break-even - 10 or more years	82	289,774	3,534	164,711	2,009	18,676	228	10,685	130	
Sales below break-even - Unknown	1	-	-	-	-	-	-	-	-	
Sales below break-even - 1 year	1	524	524	50	50	3	3	3	3	
Sales below break-even - 2~3 years	15	11,974	798	10,515	701	16,059	1,071	5,806	387	
Sales below break-even - 4~5 years	27	31,676	1,173	12,506	463	4,837	179	2,615	97	
Sales below break-even - 6~9 years	58	283,291	4,884	224,653	3,873	45,383	782	23,932	413	
Sales above break-even - 10 or more years	201	3,215,703	15,999	446,610	2,222	156,974	781	99,018	493	
Sales - Unknown	52	23,755	457	23,225	447	2,055	40	1,595	31	
<input checked="" type="checkbox"/> Main type of industry										
Biopharmaceutical industry	330	1,784,494	5,408	996,423	3,019	490,471	1,486	353,457	1,071	
Biochemical industry	206	2,568,681	12,469	118,190	574	58,554	284	18,457	90	
Biofood industry	197	280,658	1,425	86,500	439	41,768	212	13,219	67	
Bioenvironmental industry	76	24,847	327	9,183	121	3,401	45	1,793	24	
Bioelectronics industry	22	27,793	1,263	22,764	1,035	3,677	167	1,087	49	
Bioprocess and equipment industry	71	90,926	1,281	21,038	296	2,614	37	1,553	22	
Bioenergy and bioresource industry	26	63,417	2,439	21,064	810	155,309	5,973	4,056	156	
Bioassay, bioinformatics and R&D service industry	50	44,057	881	37,398	748	21,139	423	18,340	367	
<input checked="" type="checkbox"/> Number of employees										
Less than 50	574	181,686	317	117,982	206	37,537	65	29,281	51	
50-299	272	404,516	1,487	306,572	1,127	147,782	543	63,762	234	
300-999	75	63,526	8,447	325,096	4,335	69,453	926	17,783	237	
More than 1,000	46	3,665,145	79,677	562,910	12,237	522,161	11,351	301,136	6,546	
Unknown	11	-	-	-	-	-	-	-	-	
<input type="checkbox"/> Sales situation - No sales										
Biopharmaceutical industry	Less than 50	40	5,869	147	4,913	123	152	4	152	4
	50-299	41	15,081	368	5,510	134	1,975	48	998	24
	300-999	17	283,164	16,657	192,101	11,300	27,331	1,608	8,462	498
	More than 1,000	2	27,276	13,638	100	50	-	-	-	-
	Unknown	1	-	-	-	-	-	-	-	-
Biochemical industry	Less than 50	26	4,543	175	2,071	80	421	16	206	8
	50-299	12	7,307	609	2,841	237	1,150	96	280	23
	300-999	3	7,658	2,553	400	133	1,000	333	40	13
	More than 1,000	6	212,054	35,342	7,500	1,250	19,000	3,167	3,200	533
Biofood industry	Less than 50	25	2,996	120	1,582	63	907	36	307	12
	50-299	17	4,928	290	1,960	115	5,030	296	910	54
	300-999	7	14,856	2,122	2,536	362	320	46	275	39
	More than 1,000	10	33,300	3,330	3,900	390	15,500	1,550	2,100	210
	Unknown	1	-	-	-	-	-	-	-	-
Bioenvironmental industry	Less than 50	19	1,461	77	120	6	100	5	50	3
	50-299	4	168	42	93	23	-	-	-	-
Bioelectronics industry	Less than 50	5	100	20	10	2	100	20	10	2
	50-299	2	1,750	875	500	250	500	250	300	150
Bioprocess and equipment industry	Less than 50	17	1,274	75	750	44	750	44	445	26
	50-299	4	2,689	672	2,489	622	-	-	-	-
	Unknown	1	-	-	-	-	-	-	-	-
Bioenergy and bioresource industry	Less than 50	7	920	131	620	89	350	50	350	50
	50-299	3	5,091	1,697	400	133	-	-	-	-
	More than 1,000	1	39,491	39,491	3,000	3,000	150,500	150,500	500	500
Bioassay, bioinformatics and R&D service industry	Less than 50	7	95	14	30	4	40	6	30	4
	50-299	2	172	86	172	86	-	-	-	-
	300-999	1	2,000	2,000	2,000	2,000	50	50	50	50

	Total	Total R&D Investment		R&D Investment in Bioindustry		Total Facility Investment		Facility Investment in Bioindustry		
		Total	Average	Total	Average	Total	Average	Total	Average	
Number of companies	978	4,884,873	4,995	1,312,560	1,342	776,933	794	411,962	421	
<input type="checkbox"/> Sales below break-even - 1 year										
Bio pharmaceutical industry	1	400	400	400	400	200	200	200	200	
50~299	3	3,000	1,000	3,000	1,000	3,330	1,110	2,030	677	
300~999	1	22,101	22,101	11,600	11,600	1,261	1,261	484	484	
Biofood industry	1	80	80	10	10	-	-	-	-	
50~299	1	80	80	10	10	-	-	-	-	
Bioenvironmental industry	1	412	412	412	412	12	12	12	12	
Less than 50	1	412	412	420	420	200	200	200	200	
Bioelectronics industry	1	412	412	420	420	200	200	200	200	
Bioassay, bioinformatics and R&D service industry	2	1,997	999	1,708	854	920	460	920	460	
<input type="checkbox"/> Sales below break-even - 2~3 years										
Bio pharmaceutical industry	9	8,319	924	6,638	738	94	10	94	10	
50~299	7	5,188	741	2,405	344	4,435	634	2,195	314	
300~999	1	15,000	15,000	11,000	11,000	1,800	1,800	800	800	
More than 1,000	2	54,366	27,183	20,000	10,000	231,350	115,675	223,350	111,675	
Biochemical industry	16	1,428	89	1,332	83	398	25	300	19	
50~299	3	5,250	1,750	1,200	400	112	37	51	17	
300~999	1	21,347	21,347	21,347	21,347	2,500	2,500	1,000	1,000	
Biofood industry	8	1,720	215	1,670	209	6	1	6	1	
50~299	1	380	380	150	150	-	-	-	-	
300~999	1	1,850	1,850	20	20	100	100	10	10	
Bioenvironmental industry	3	306	102	306	102	30	10	30	10	
Less than 50	3	1,060	353	1,020	340	200	67	200	67	
Bioelectronics industry	3	306	102	306	102	30	10	30	10	
Bio process and equipment industry	4	1,264	316	564	141	45	11	30	8	
Bioenergy and bioresource industry	2	587	294	200	100	100	50	100	50	
50~299	1	294	294	10	10	10	10	10	10	
Bioassay, bioinformatics and R&D service industry	1	250	250	250	250	-	-	-	-	
<input type="checkbox"/> Sales below break-even - 4~5 years										
Bio pharmaceutical industry	15	11,185	746	10,912	727	2,140	143	2,140	143	
50~299	8	12,717	1,590	6,961	870	11,174	1,397	3,428	429	
Biochemical industry	19	3,332	175	2,198	116	472	25	172	9	
50~299	1	450	450	80	80	-	-	-	-	
300~999	1	3,540	3,540	500	500	1,541	1,541	621	621	
More than 1,000	1	-	-	-	-	-	-	-	-	
Biofood industry	15	4,395	293	3,669	245	2,683	179	2,666	178	
50~299	4	3,067	767	758	190	6,429	1,607	90	23	
Bioenvironmental industry	9	1,134	126	964	107	195	22	170	19	
50~299	1	419	419	419	419	-	-	-	-	
Bioelectronics industry	1	150	150	100	100	-	-	-	-	
50~299	2	8,000	4,000	4,500	2,250	2,500	1,250	200	100	
Bio process and equipment industry	10	2,854	285	1,399	140	481	48	281	28	
Bioenergy and bioresource industry	4	100	25	100	25	210	53	210	53	
Bioassay, bioinformatics and R&D service industry	4	1,299	325	949	237	504	126	504	126	
50~299	1	3,334	3,334	2,405	2,405	1,659	1,659	1,369	1,369	
<input type="checkbox"/> Sales below break-even - 6~9 years										
Bio pharmaceutical industry	17	13,829	813	12,619	742	1,450	85	630	37	
50~299	5	14,141	2,828	13,073	2,615	16,396	3,279	627	125	
300~999	2	3,283	1,642	3,283	1,642	6,374	3,187	188	94	
Biochemical industry	21	13,848	659	12,948	617	2,977	142	2,627	125	
50~299	1	6,792	6,792	6,792	6,792	-	-	-	-	
More than 1,000	2	83,167	41,584	14,000	7,000	300	150	300	150	
Biofood industry	23	5,029	219	3,136	136	480	21	336	15	
50~299	1	632	632	632	632	-	-	-	-	
Bioenvironmental industry	7	354	51	148	21	102	15	62	9	
50~299	2	1,000	500	1,000	500	-	-	-	-	
Bioelectronics industry	1	-	-	-	-	-	-	-	-	
Bio process and equipment industry	1	200	200	10	10	-	-	-	-	
50~299	1	3,500	3,500	3,500	3,500	100	100	100	100	
Bioenergy and bioresource industry	1	750	750	550	550	350	350	250	250	
Bioassay, bioinformatics and R&D service industry	5	1,578	316	1,275	255	150	30	150	30	
50~299	1	2,835	2,835	150	150	2,000	2,000	500	500	

	Total	Total R&D Investment		R&D Investment in Bioindustry		Total Facility Investment		Facility Investment in Bioindustry		
		Total	Average	Total	Average	Total	Average	Total	Average	
Number of companies	978	4,884,873	4,995	1,312,560	1,342	776,933	794	411,962	421	
<input type="checkbox"/> Sales below break-even - 10 or more years										
Bio pharmaceutical industry	12	10,173	848	7,463	622	106	9	106	9	
50~299	8	67,503	8,438	62,835	7,854	3,729	466	3,152	394	
300~999	5	38,658	7,732	13,018	2,604	1,680	336	833	167	
More than 1,000	3	151,444	50,481	63,839	21,280	8,822	2,941	3,111	1,037	
Biochemical industry	11	1,300	118	1,257	114	90	8	90	8	
50~299	1	1,929	1,929	300	300	200	200	100	100	
Biofood industry	20	4,769	238	3,447	172	1,027	51	751	38	
50~299	4	3,118	780	2,768	692	2,101	525	2,101	525	
Bioenvironmental industry	5	620	124	610	122	50	10	50	10	
50~299	1	400	400	-	-	50	50	-	-	
Bioelectronics industry	1	5,773	5,773	5,773	5,773	-	-	-	-	
Bio process and equipment industry	5	857	171	597	119	150	30	150	30	
50~299	1	715	715	715	715	35	35	14	14	
Bioassay, bioinformatics and R&D service industry	4	1,599	400	1,173	293	419	105	10	3	
50~299	1	916	916	916	916	217	217	217	217	
<input type="checkbox"/> Sales below break-even - Unknown										
Biofood industry	1	-	-	-	-	-	-	-	-	
<input type="checkbox"/> Sales below break-even - 1 year										
Biofood industry	1	524	524	50	50	3	3	3	3	
<input type="checkbox"/> Sales below break-even - 2~3 years										
Bio pharmaceutical industry	1	396	396	396	396	-	-	-	-	
50~299	5	9,649	1,930	9,649	1,930	14,500	2,900	5,500	1,100	
Biochemical industry	3	1,600	533	300	100	1,282	427	217	72	
Biofood industry	3	30	10	20	7	-	-	-	-	
Bioenvironmental industry	1	239	239	150	150	277	277	89	89	
Bioelectronics industry	1	-	-	-	-	-	-	-	-	
Bio process and equipment industry	1	60	60	-	-	-	-	-	-	
<input type="checkbox"/> Sales below break-even - 4~5 years										
Bio pharmaceutical industry	6	1,510	252	1,100	183	1,856	309	954	159	
50~299	2	1,683	842	1,254	627	-	-	-	-	
300~999	1	1,169	1,169	1,169	1,169	29	29	29	29	
Biochemical industry	9	1,010	112	658	73	530	59	365	41	
50~299	1	332	332	332	332	106	106	106	106	
300~999	1	24,914	24,914	7,000	7,000	-	-	-	-	
Biofood industry	2	730	365	715	358	10	5	8	4	
Bioenvironmental industry	1	100	100	50	50	-	-	-	-	
Bioenergy and bioresource industry	2	178	89	178	89	2,306	1,153	1,153	577	
Bioassay, bioinformatics and R&D service industry	2	50	25	50	25	-	-	-	-	
<input type="checkbox"/> Sales above break-even - 6~9 years										
Bio pharmaceutical industry	4	2,247	562	2,247	562	3,884	971	3,884	971	
50~299	4	6,812	1,703	6,812	1,703	25,000	6,250	300	75	
300~999	1	5,408	5,408	2,400	2,400	200	200	170	170	
More than 1,000	2	235,937	117,969	200,921	100,461	8,852	4,426	14,359	7,180	
Biochemical industry	13	6,134	472	4,214	324	4,765	367	4,600	354	
50~299	3	5,369	1,790	410	137	183	61	20	7	
More than 1,000	1	-	-	-	-	-	-	-	-	
Biofood industry	12	1,199	100	1,122	94	191	16	181	15	
50~299	2	4,301	2,151	1,150	575	2,000	1,000	150	75	
Bioenvironmental industry	4	528	132	211	53	-	-	-	-	
300~999	1	9,794	9,794	358	358	40	40	-	-	
Bioelectronics industry	1	100	100	100	100	50	50	50	50	
Bio process and equipment industry	2	456	228	406	203	6	3	6	3	
50~299	4	4,253	1,063	3,549	887	212	53	212	53	
Bioenergy and bioresource industry	1	393	393	393	393	-	-	-	-	
Bioassay, bioinformatics and R&D service industry	2	360	180	360	180	-	-	-	-	
50~299	1	-	-	-	-	-	-	-	-	

	Total	Domestic																																																						
		Sub Total	Business Entities																Research Institutes																																					
			1-299				300-999				1,000 or more				Government-invested				Private				Universities				Medical Institutes																													
			Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com																			
Number of companies		978	798	246	284	115	104	51	173	56	47	34	30	6	69	6	43	4	3	13	23	8	10	2	3	-	15	52	39	22	24	17	34	19	6	5	4	-	287	91	110	38	36	12	58	14	29	10	2	3						
Bioelectronics industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioprocess and equipment industry	Less than 50	1	3	3	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioenergy and bioresource industry	Less than 50	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioassay, bioinformatics and R&D service industry	Less than 50	5	10	10	0	0	0	0	0	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Biopharmaceutical industry	50-299	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
□ Sales below break-even - 10 or more years																																																								
Biopharmaceutical industry	Less than 50	12	18	7	11	0	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	8	17	6	7	2	2	0	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	300-999	5	11	0	0	9	2	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	More than 1,000	3	7	1	3	3	0	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Biochemical industry	Less than 50	11	13	2	3	1	5	2	4	1	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	1	5	1	1	3	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Biofood industry	Less than 50	20	19	8	6	1	4	0	8	5	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	4	17	3	7	6	1	0	10	5	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioenvironmental industry	Less than 50	5	2	0	0	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioelectronics industry	300-999	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioprocess and equipment industry	Less than 50	5	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	1	4	0	4	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioassay, bioinformatics and R&D service industry	Less than 50	4	1	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	1	4	0	4	0	0	0	0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
□ Sales below break-even - Unknown																																																								
Biofood industry	Less than 50	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
□ Sales below break-even - 1 year																																																								
Biofood industry	Less than 50	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
□ Sales below break-even - 2-3 years																																																								
Biopharmaceutical industry	Less than 50	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	5	9	1	1	1	5	1	6	1	1	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Biochemical industry	Less than 50	3	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Biofood industry	Less than 50	3	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioenvironmental industry	50-299	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioelectronics industry	Less than 50	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioprocess and equipment industry	Less than 50	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
□ Sales below break-even - 4-5 years																																																								
Biopharmaceutical industry	Less than 50	6	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	2	7	1	6	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	300-999	1	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

	Total	Domestic																																
		Sub Total	Business Entities																Research Institutes															
			1-299				300-999				1,000 or more				Government-invested				Private				Universities				Medical Institutes							
			Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas	Expe	Prot	Com	Total	Bas
Number of companies		978	798	246	284	115	102	51	173	56	47	34	30	6	69	6																		

	Total	Domestic																																																	
		Sub Total			Business Entities												Research Institutes																																		
					1~299				300~999				1,000 or more				Government-invested			Private			Universities			Medical Institutes																									
		Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com														
Number of companies	978	798	246	284	115	102	51	173	56	47	34	30	6	69	6	43	4	3	13	23	8	10	2	3	15	52	39	22	24	17	34	19	6	5	4	287	91	110	38	36	12	58	14	29	10	2	3				
Bioenvironmental industry		10	4	0	2	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bioelectronics industry		2	1	0	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry		8	7	2	2	0	3	0	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioenergy and bioresource industry		1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bioassay, bioinformatics and R&D service industry		6	2	0	1	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
□ Sales - Unknown		8	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biopharmaceutical industry		8	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Biochemical industry		5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biofood industry		2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioenvironmental industry		1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioprocess and equipment industry		2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bioassay, bioinformatics and R&D service industry		2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

< Table4-4 > Overseas Scale of Joint R&D Contract Cooperation (III-4) (Unit : Cases, Count)

	Total	Overseas																																																		
		Sub Total			Business Entities												Research Institutes																																			
					1~299				300~999				1,000 or more				Government-invested			Private			Universities			Medical Institutes																										
		Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com															
Number of companies	978	58	9	19	16	9	5	26	4	5	9	5	3	3	1	2	-	-	10	5	3	2	3	1	1	-	-	2	1	1	-	-	2	1	1	-	-	11	1	6	1	1	2	3	1	1	1	-				
■ Sales Situation																																																				
No sales	281	5	3	0	1	1	0	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales below break-even - 1 year	10	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sales below break-even - 2~3 years	63	14	3	3	5	3	0	10	1	1	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales below break-even - 4~5 years	96	3	1	1	1	0	0	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sales below break-even - 6~9 years	91	1	0	0	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales below break-even - 10 or more years	82	5	1	0	4	0	1	1	-	-	-	-	2	-	2	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Sales below break-even - Unknown	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales below break-even - 1 year	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales below break-even - 2~3 years	15	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales below break-even - 4~5 years	27	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales above break-even - 6~9 years	58	5	0	4	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sales above break-even - 10 or more years	201	22	1	8	4	4	5	8	-	3	2	3	-	-	-	-	-	3	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Sales - Unknown	52	3	0	3	0	0	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
■ Main type of industry																																																				
Biopharmaceutical industry	330	39	0	15	13	6	5	19	-	4	9	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Biochemical industry	206	2	1	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Biofood industry	197	7	3	2	1	1	0	3	2	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioenvironmental industry	76	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bioelectronics industry	22	2	0	1	0	1	0	2	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioprocess and equipment industry	71	2	0	0	2	0	0	-	-	-																																										

	Total	Overseas																																															
		Sub Total				Business Entities												Research Institutes																															
						1-299			300-999			1,000 or more			Government-invested				Private				Universities				Medical Institutes																						
		Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com																
Number of companies		978	58	9	19	16	9	5	26	4	5	9	5	3	3	1	-	2	-	-	10	-	5	3	2	-	3	1	1	-	1	-	2	1	1	-	-	-	11	1	6	1	1	2	3	1	1	-	-
Biochemical industry	Less than 50	26	1	1	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	12	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	300-999	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	More than 1,000	6	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Biofood industry	Less than 50	25	2	2	0	0	0	0	1	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	50-299	17	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	300-999	7	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	More than 1,000	10	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioenvironmental industry	Less than 50	19	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	4	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioelectronics industry	Less than 50	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioprocess and equipment industry	Less than 50	17	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	4	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioenergy and bioresource industry	Less than 50	7	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	More than 1,000	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Bioassay, bioinformatics and R&D service industry	Less than 50	7	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
☐ Sales below break-even - 1 year																																																	
Biopharmaceutical industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	50-299	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Biofood industry	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Bioenvironmental industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Bioelectronics industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
Bioassay, bioinformatics and R&D service industry	Less than 50	2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
☐ Sales below break-even - 2-3 years																																																	
Biopharmaceutical industry	Less than 50	9	8	0	1	5	2	0	7	-	-	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	50-299	7	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	More than 1,000	2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							

	Total	Overseas																																															
		Sub Total				Business Entities												Research Institutes																															
						1-299			300-999			1,000 or more			Government-invested				Private				Universities				Medical Institutes																						
		Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com	Total	Experim	Prot	Com																
Number of companies		978	58	9	19	16	9	5	26	4	5	9	5	3	3	1	-	2	-	-	10	-	5	3	2	-	3	1	1	-	1	-	2	1	1	-	-	-	11	1	6	1	1	2	3	1	1	-	-
Biochemical industry	Less than 50	16	0	0	0	0	0	0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	300-999	1	0	0	0	0	0	0	-	-	-																																						

	Total	Overseas																																																								
		Sub Total					Business Entities															Research Institutes																																				
							1-299					300-999					1,000 or more					Government-invested					Private					Universities					Medical Institutes																					
		Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod	Com																	
Number of companies		978	58	9	19	16	9	5	26	4	5	9	5	3	3	1	-	2	-	10	-	5	3	2	-	3	1	1	-	1	-	2	1	1	-	-	11	1	6	1	1	2	3	1	1	1	-	-										
Bioelectronics industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Bioenergy and bioresource industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
<input type="checkbox"/> Sales below break-even - 10 or more years																																																										
Biopharmaceutical industry	Less than 50	12	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	50-299	8	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	300-999	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	More than 1,000	3	2	0	0	2	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Biochemical industry	Less than 50	11	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Biofood industry	Less than 50	20	1	1	0	0	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	4	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioenvironmental industry	Less than 50	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioelectronics industry	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioprocess and equipment industry	Less than 50	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	1	2	0	0	2	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioassay, bioinformatics and R&D service industry	Less than 50	4	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<input type="checkbox"/> Sales below break-even - Unknown																																																										
Biofood industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<input type="checkbox"/> Sales below break-even - 1 year																																																										
Biofood industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<input type="checkbox"/> Sales below break-even - 2-3 years																																																										
Biopharmaceutical industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Biochemical industry	Less than 50	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Biofood industry	Less than 50	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioenvironmental industry	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioelectronics industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioprocess and equipment industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<input type="checkbox"/> Sales below break-even - 4-5 years																																																										
Biopharmaceutical industry	Less than 50	6	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

	Total	Overseas																																		
		Sub Total					Business Entities															Research Institutes														
							1-299					300-999					1,000 or more					Government-invested					Private					Universities				
		Total	Exper	Prot	Prod	Com	Total	Exper	Prot	Prod																										

	Total	Overseas																																												
		Sub Total		Business Entities												Research Institutes																														
				1~299				300~999				1,000 or more				Government-invested				Private				Universities				Medical Institutes																		
		Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com									
Number of companies	978	58	9	19	16	9	5	26	4	5	9	5	3	3	1	2	-	-	10	5	3	2	-	3	1	1	-	1	-	2	1	1	-	-	11	1	6	1	1	2	3	1	1	1	-	-
Bioenvironmental industry																																														
Less than 50	10	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	4	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
More than 1,000	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioelectronics industry																																														
Less than 50	2	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
300~999	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioprocess and equipment industry																																														
Less than 50	8	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	7	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
300~999	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioenergy and bioresource industry																																														
Less than 50	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	2	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
300~999	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioassay, bioinformatics and R&D service industry																																														
Less than 50	6	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	8	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
□ Sales - Unknown																																														
Biopharmaceutical industry																																														
Less than 50	8	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	12	3	0	3	0	0	0	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
300~999	4	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Unknown	5	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Biochemical industry																																														
Less than 50	5	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	2	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
300~999	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
More than 1,000	3	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Unknown	2	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Biofood industry																																														
Less than 50	2	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioenvironmental industry																																														
Less than 50	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Unknown	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioprocess and equipment industry																																														
Less than 50	2	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
50~299	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
300~999	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioassay, bioinformatics and R&D service industry																																														
Less than 50	2	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				

< Table4 > Cooperation in Bioindustry

< Table4-5 > Domestic Scale of Technical Tie-up (Licensing) Cooperation (III-4) (Unit : Cases, Count)

	Total	Domestic																																													
		Sub Total		Business Entities												Research Institutes																															
				1~299				300~999				1,000 or more				Government-invested				Private				Universities				Medical Institutes																			
		Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com	Total	Expe	Prot	Com										
Number of companies	978	112	35	34	17	16	10	44	11	9	10	9	5	3	2	-	-	6	3	3	-	-	-	10	1	7	-	2	-	4	1	2	1	-	-	42	16	11	6	5	4	1	-	-	-	-	1
■ Sales Situation																																															
No sales	281	27	13	4	5	4	1	16	4	3	5	3	1	2	2	-	-	2	2	-	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Sales below break-even - 1 year	10	1	0	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Sales below break-even - 2~3 years	63	10	0	5	0	2	3	6	2	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Sales below break-even - 4~5 years	96	10																																													

	Total	Overseas																																																									
		Sub Total				Business Entities												Research Institutes																																									
						1-299				300-999				1,000 or more				Government-invested				Private				Universities				Medical Institutes																													
		Total	Exper	Prot	Comm	Total	Exper	Prot	Comm	Total	Exper	Prot	Comm	Total	Exper	Prot	Comm	Total	Exper	Prot	Comm	Total	Exper	Prot	Comm	Total	Exper	Prot	Comm	Total	Exper	Prot	Comm																										
Number of companies		978	41	4	8	22	2	5	21	2	4	9	2	4	2	-	-	1	-	1	7	-	4	3	-	-	8	-	-	8	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	1	-	-	1	-	-								
Bioelectronics industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Bioprocess and equipment industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Bioenergy and bioresource industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
□ Sales below break-even - 10 or more years																																																											
Biopharmaceutical industry	Less than 50	12	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	50-299	8	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	300-999	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	More than 1,000	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Biochemical industry	Less than 50	11	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Biofood industry	Less than 50	20	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	50-299	4	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bioenvironmental industry	Less than 50	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioelectronics industry	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioprocess and equipment industry	Less than 50	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	1	1	0	0	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bioassay, bioinformatics and R&D service industry	Less than 50	4	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
□ Sales below break-even - Unknown																																																											
Biofood industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
□ Sales below break-even - 1 year																																																											
Biofood industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
□ Sales below break-even - 2-3 years																																																											
Biopharmaceutical industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	5	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Biochemical industry	Less than 50	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Biofood industry	Less than 50	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioenvironmental industry	50-299	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioelectronics industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bioprocess and equipment industry	Less than 50	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
□ Sales below break-even - 4-5 years																																																											
Biopharmaceutical industry	Less than 50	6	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	50-299	2	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	300-999	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

	Total	Overseas																															
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< Table 5-2 > Size of Import by Category among
Classification Scheme of Bioindustry (III-7) (Unit : million Won)

Industry	Industry Name	Category No.	Category Name	Domestic Sales	Export	Total		
5	Bioelectronics industry	5010	DNA chips	4,228	647	4,875		
		5020	Protein chips	-	-	-		
		5030	Cell chips	-	-	-		
		5040	Biosensors	26,381	128,121	154,502		
		5050	BioMEMS	-	-	-		
		5000	Other bioelectronics	165	656	821		
		Subtotal				30,774	129,425	160,199
		6	Bioprocess and equipment industry	6010	Bioreactors	1,514	341	1,855
6020	Biomedical and diagnostic apparatuses			23,543	16,634	40,177		
6030	Bioprocess and analysis equipments			33,937	26,859	60,796		
6040	Plant and process design			25,000	-	25,000		
6000	Other bioprocess and equipments			5,050	29,715	34,765		
Subtotal						89,044	73,548	162,592
7	Bioenergy and bioresource industry	7010	Biofuel	402,803	20,814	423,617		
		7020	Artificial seeds and seedlings	126,731	25,927	152,658		
		7030	Experimental animals	24,181	-	24,181		
		7040	Transgenic animals and plants	1,504	-	1,504		
		7000	Other bioenergy and bioresources	44,854	-	44,854		
		Subtotal				600,073	46,741	646,814
8	Bioassay, bioinformatics and R&D service industry	8010	Bioinformatics services	238	16	254		
		8020	Gene analysis services	47,212	31,436	78,648		
		8030	Protein analysis services	2,025	300	2,325		
		8040	R&D services	21,113	6,611	27,724		
		8050	Biosafety and efficacy evaluation services	92,781	7,363	100,144		
		8060	Diagnosis and preservation services	37,391	23	37,414		
		8000	Other bioassays, bioinformatics services	80	-	80		
		Subtotal				200,840	45,749	246,589
Total				4,209,360	4,251,346	8,460,706		

Industry	Industry Name	Category No.	Category Name	Import	
1	Biopharmaceutical industry	1010	Antibiotics	16,243	
		1020	Anticancer medications	170,144	
		1030	Vaccines	270,708	
		1040	Hormones	231,750	
		1050	Immunotherapeutics	62,733	
		1060	Hemotherapeutics	199,641	
		1070	Growth factors	-	
		1080	New therapeutics	12,441	
		1090	Diagnostic kits	30,714	
		1100	Animal medications	10,610	
		1000	Other biopharmaceuticals	215,701	
		Subtotal			1,220,685
		2	Biochemical industry	2010	Biopolymers
2020	Industrial enzymes and reagents			16,984	
2030	Enzymes and reagents for research			44,189	
2040	Biocosmetics and home & personal care chemicals			4,128	
2050	Biological agrochemicals and fertilizers			482	
2000	Other biochemicals			21,927	
Subtotal					87,710
3	Biofood industry	3010	Functional health foods	16,651	
		3020	Amino acids	10,374	
		3030	Food additives	2,885	
		3040	Fermented foods	-	
		3050	Feed additives	5,940	
		3000	Other biofoods	226	
		Subtotal			36,076
4	Bioenvironmental industry	4010	Microbial treatment agents	-	
		4020	Microbe-immobilized materials and equipments	-	
		4030	Bioenvironmental agents and systems	-	
		4040	Measuring apparatus for environmental pollution(service for pollution assessment)	119	
		4000	Other bioenvironmental productions and services	-	
		Subtotal			119

Industry	Industry Name	Category No.	Category Name	Import
5	Bioelectronics industry	5010	DNA chips	270
		5020	Protein chips	-
		5030	Cell chips	-
		5040	Biosensors	500
		5050	BioMEMS	-
		5000	Other bioelectronics	-
			Subtotal	770
6	Bioprocess and equipment industry	6010	Bioreactors	300
		6020	Biomedical and diagnostic apparatuses	1,620
		6030	Bioprocess and analysis equipments	50,519
		6040	Plant and process design	-
		6000	Other bioprocess and equipments	1,342
			Subtotal	53,781
7	Bioenergy and bioresource industry	7010	Biofuel	1,697
		7020	Artificial seeds and seedlings	6,445
		7030	Experimental animals	-
		7040	Transgenic animals and plants	52
		7000	Other bioenergy and bioresources	-
			Subtotal	8,194
8	Bioassay, bioinformatics and R&D service industry	8010	Bioinformatics services	400
		8020	Gene analysis services	-
		8030	Protein analysis services	-
		8040	R&D services	964
		8050	Biosafety and efficacy evaluation services	-
		8060	Diagnosis and preservation services	-
		8000	Other bioassays, bioinformatics services	-
			Subtotal	1,364
Total				1,408,699

Appendix : Explanation on Classification Scheme

1. Bioindustry

1. Biopharmaceutical industry

Field of study concerning biopharmaceuticals, medical drugs or medical equipment produced using biotechnology in the R&D or production process to diagnosis, prevent and cure diverse diseases of human or animals. It is an industry that produces the following products.

1010 Antibiotics

Base material or related medicine that inhibits or kills the growth and proliferation of microorganisms

Exception 1110) Animal medications

1020 Anticancer medications

Base material or medicine that is used in cure for malignant tumor

1030 Vaccines

Antigen used to automatically increase immunity of a person or animal in the prevention of infectious diseases (Substance that prevents or cures diseases selectively by artificially stimulating the immune system)

1040 Hormones

Base material and related medicine that is made of hormones, its variants or analogs to cure special diseases using physiological characteristics of hormones

1050 Immunotherapeutics

Base material and related medicine that is used to adjust bioimmune activities such as protein substances

1060 Hemotherapeutics

Serum protein products which were separated from blood or biotechnologically manufactured materials and medical products, which are used to treat pathologic conditions of patients (symptoms caused by deficiency in serum protein, etc.)

1070 Growth factors

Polypeptides which facilitate cell division, growth or differentiation, and their modified substances or analogues (including their mimicking agents or peptides which have only the active fraction)

1080 New therapeutics(ex. gene therapeutics, cell therapy, cloned organs, etc.)

New therapeutic agents which have different way of treatment compared to existing agents (Gene therapeutics, cell therapy products, cloned organs and therapeutic antibodies are included in this category at present.)

<Reference>

Gene therapeutics - Agents of normal genes which are transduced in patients to treat diseases caused by genetic abnormalities

Cell therapyproducts - Medical products of living autologous, allogenic or xenogenic cells which are processed to be modified their biological characteristics by in vitro proliferation, selection or other methods

Cloned organs - Artificial organ substitutes which are not mechanical attachments or implants but organs produced by cell culture

Therapeutic antibodies- Antibodies of major immunologic mechanisms which are produced in vitro to protect human body from foreign pathogenic organisms

1090 Diagnostic kits

Kits and reagents which are used to diagnose the actual condition of diseases

Exception Reagents used in research are classified as '2030) Enzymes and reagents for research'

1100 Animal medications

Therapeutic products which are used to diagnose, treat and prevent diseases of animals (including probiotics)

Exception 3050) Feed additives

1000 Other biopharmaceuticals

Other biomedical products which are not classified above (including ingredients and intermediates which are not classified above)

Exception 3020) Amino acids

2. Biochemical industry

Industrial activities which produce compounds or substitutes of existing chemical products using bio-purification technology or biotechnology in R&D or manufacturing process [excluding products which are used mainly in medical purpose]

2010 Biopolymers

Materials (structural constituents), biocompatible polymers and biodegradable resins (functional packaging materials) which are made from proteins, nucleic acids or polyssacharides

Exception 1090) New therapeutics

2020 Industrial enzymes and reagents

Enzymes which are extracted from industrially valuable organisms or produced by biotechnology, and other industrial reagents

2030 Enzymes and reagents for research

Reagents, buffer solutions, polymerases, reagent kits, DNA vectors and gene expression systems

2040 Bocosmetics and home & personal care chemicals

Household items such as a soap, detergents and functional cosmetics

2050 Biological agrochemicals and fertilizers

Microbial agents which are used to exterminate or control weeds, pests or microorganisms which inhibit growth of crops, and microbial agents which enrich nutrients in soil to enhance growth of crops

Exception For agricultural pesticides and fertilizers produced by a bioprocess using non-microbial or non-biological agents, refer to '2000) Other biochemicals'.

2000 Other biochemicals

Other biochemicals which are not classified above (including macromolecular monomers, solvents and others)

3. Biofood industry

Industrial activities which produce foods, beverages, animal foods and animal/vegetable fat and oil using bio-purification technology or biotechnology in R&D or manufacturing process [excluding products which

are used mainly in medical purpose]

3010 Functional health foods

which functionally useful ingredients for human body and biotechnology are used in its manufacturing (limited to foods which Commissioner of Korea Food and Drug Administration admitted that they have functionality according to 「The Law for Functional Health Foods」)

3020 Amino acids

Aminoacids used in drugs, foods and feed additives

3030 Food additives

Substances which are added in foods such as seasonings, food preservatives, nucleotides, peptides and lipids (including starch, organic acids and functional sugar, etc.)

Exception 3010) Functional health foods
3020) Amino acids

3040 Fermented foods

Products which went through fermentation process such as fermented sauces, alcoholic beverages, pickled vegetables and fermented livestock foods

Exception 3010) Functional health foods

3050 Feed additives

Various kinds of feed additives, nutrients and feedstuffs for animal raising or fish farming

Exception For animal drugs including probiotics, refer to '1100 animal drugs'.

3000 Other biofoods

Other biofoods which were not classified above (including ingredients and intermediates which were not classified above)

4. Bioenvironmental industry

Industrial activities which produce substances or systems for environmental cleanup, environmental remediation and reducing/preventing environmental pollution using bioderivatives or biotechnology in R&D or manufacturing process, or industrial activities which build up pollution diagnosis and assessment services or facilities using these products, providing following products or services

4010 Microbial treatment agents

Microorganism agents for the purpose of environmental cleanup (waste/wastewater treatment, etc.), reducing/preventing environmental pollution (biodesulfurization, biocracking, biocollection, biopulping, etc.) and environmental remediation, including construction and installation services associated with selling such products

4020 Microbe-immobilized materials and equipments

Immobilized materials and equipments for the purpose of environmental cleanup (waste/wastewater treatment, foul smell/VOC treatment, etc.) such as a microorganism-utilizing filter, including construction and installation services associated with selling such products

4030 Bioenvironmental agents and systems

Materials, equipments and systems for the purpose of

waste/wastewater treatment, foul smell/VOC treatment, environmental remediation and resource recycling, including construction and installation services associated with selling such products

Exception 4010) Microbial treatment agents

4020) Microbe-immobilized materials and equipments

4040 Measuring apparatus for environmental pollution(service for pollution assessment)

Equipments which measure water quality, soil pollution level and air pollution level (including construction and installation services associated with selling such products), and pollution source diagnosis and pollution level measuring services on demand of customers

Exception 5040) Biosensors

4000 Other bioenvironmental productions and services

Other bioenvironmental products which were not classified above (including ingredients and intermediates which were not classified above) and associates services

5. Bioelectronics industry

Industrial activities which produce components/materials of medical or analytical purpose using nano/electronic technology, bio information or biotechnology in R&D or manufacturing process, producing following products

5010 DNA chips

Detecting devices which fix DNAs

5020 Protein chips

Detecting devices which fix proteins

5030 Cell chips

Detecting devices which fix cells and devices which analyze cellular phenomena

5040 Biosensors

Detecting devices which utilize various kinds of biofunctions

5050 BioMEMS

Micro electromechanical systems(MEMS) for the purpose of medical or R&D use such as biotechnology, health examination or drug administration

5000 Other bioelectronics

Other bioelectronic components/materials which are not classified above

Example Biocomputers, neurochips, carbohydrate chips

6. Bioprocess and equipment industry

Industrial activities which produce devices, equipments and plants for the purpose of using bioderivatives or biotechnologies in R&D or manufacturing process, providing following products or services [including biomedical devices and diagnostic devices]

6010 Bioreactors

Devices which produce valuable substances using biological reactions

Example Fermentation bath, cell incubators, enzyme reaction

incubators

6020 Biomedical and diagnostic apparatuses

Devices which examine and diagnose physical or physiologic functions for medical purpose

Exception

1080) Newtherapeutics, diagnostic reagents and kits
2010) Biopolymers
5040) Biosensors, BioMEMS

6030 Bioprocess and analysis equipments

Experimental and R&D devices such as separation/purification devices, synthesis/cloning devices, sequence analyzing devices, and other interpretation/analysis devices

6040 Plant and process design

System constructing and plant designing services using bioprocess technology and devices, equipments

6000 Other bioprocess and equipments

Bioprocess devices and experimental devices which are not classified above (including ingredients and components which are not classified above)

7. Bioenergy and bioresource industry

Industrial activities which develop energy by utilizing organisms or biotechnology in R&D or manufacturing process, and industrial activities which dig out and produce organisms which have novel functions and then cultivate or raise them

7010 Biofuel

Alternative fuel materials which are produced under conversion process from biomass

7020 Artificial seeds and seedlings

Seeds, improved seeds, mushroom strains and energy crops for forestry or agricultural use

7030 Experimental animals

Experimental animals including transgenic animals such as insects, mice and rats

7040 Transgenic animals and plants

Transgenic animals and plants

Exception

7020) Artificial seeds and seedlings
7030) Experimental animals

7000 Other bioenergy and bioresources

Other bioenergy (biogas) and organisms (including microbial strains and cell strains)

Exception

For developmental services, refer to subsections of "8. Bioassay, bioinformatics and R&D service industry"

8. Bioassay, bioinformatics and R&D service industry

Industrial activities of biotechnology which conduct R&D by proxy or provide analysis/assessment consulting services and associated bioinformatics, providing services described below [Activities manufacturing class 1~7 products on consignment of other companies are referred to as production activities of relevant products]

8010 Bioinformatics services

Services which provide customers with solutions based on bioinformatics and predictions

Example Bioinformatics database services, statistical analysis of bioexperimental data, oligomer designing, antibody designing and cell strain designing

8020 Gene analysis services

Services which utilize genetic analysis

Example Genetic sequence analysis, parentage test, GMO diagnosis, microorganism identification, DNA genotyping, SNP analysis

8030 Protein analysis services

Services which utilize protein analysis

Example Protein sequence/structure analysis, protein expression pattern analysis

8040 R&D services(ex. drug development services, etc.)

Activities which conduct R&D essential for product development by proxy using biotechnology. Services and technical consulting excluding providing bioinformations (In sales survey of a company, sales which come from technology transfer in biotechnological field correspond to this category)

Example New drug development

8050 Biosafety and efficacy evaluation services

Preclinical study or clinical study services

8060 Diagnosis and preservation services

Disease diagnosis services and cell line preservation services using biotechnology

Example Cord blood preservation service

Exception 8010) Bioinformatics services
8020) Gene analysis services
8030) Disease diagnosis services which utilize one of protein analysis services

8000 Other bioassays, bioinformatics services

Other bioassays, bioinformatics services which are not classified above

Example Services which provide information on standardization (GMP, FDA certification, IQ, OQ, PQ), technology and management consulting services

2. Biotechnology

A. Genetic engineering

Technology which changes the genetic characteristics of target organisms by gene manipulation or transplantation

A1. Gene manipulation

Technology which directly deal with genes such as gene identification, modification, separation, recombination, synthesis, amplification and transfer

- Corresponding List**
- A101. Genetic material development
 - A102. Gene separation
 - A103. Gene cloning
 - A104. Gene transformation
 - A105. Gene screening
 - A106. Genetic mutation
 - A107. Gene targeting
 - A108. DNA synthesis
 - A109. DNA amplification

A2. Gene expression and regulation

Technologies which modify the mode, degree or rate of expression of genetic information by intervening in replication, transcription and translation of genetic information

- Corresponding List**
- A201. Host cell development
 - A202. Gene overexpression
 - A203. Secretory expression
 - A204. Gene replication and transcriptional regulation
 - A205. Signal transduction analysis
 - A206. Oncogenesis
 - A207. Gene expression profile analysis
 - A208. High throughput gene expression
 - A209. RNA interference

A3. Gene application

Technologies which develop new molecules, nuclei or individuals

- Corresponding List**
- A301. Transgenic animals
 - A302. Transgenic plants
 - A303. Transgenic microorganisms
 - A304. Molecular evolution
 - A305. Genome shuffling

A4. Gene therapy

Technologies which are used in the whole therapeutic process from development of therapeutic genes to transferring them into human body and expression

- Corresponding List**
- A401. Ex vivo therapy
 - A402. Gene therapy vector development and production
 - A403. Evaluation of gene transfer and expression
 - A404. Therapeutic gene development
 - A405. Germline gene therapy
 - A406. In vivo model for gene therapy
 - A407. Oncolytic virus therapy
 - A408. RNA interference
 - A409. DNA vaccine

A0. Genetic engineering, n.e.s.

B. Protein engineering

Technologies which analyze structure and function of proteins and design, create or apply specific proteins

B1. Protein structure analysis

Technologies which analyze sequence, mass, planar structure and conformation of proteins

Corresponding List

- B101. Protein mass spectrometry
- B102. Protein sequence analysis
- B103. Protein 3D structure analysis
- B104. High throughput structural determination
- B105. Protein linkage maps
- B106. Protein-protein interaction mapping

B2. Protein function analysis

Technologies which analyze functions of proteins such as their stability, recognition and response

Corresponding List

- B201. Protein stability analysis
- B202. Protein folding analysis
- B203. Protein recognition mechanism analysis
- B204. Protein reaction analysis
- B205. Inhibitor screening and development
- B206. Protein linkage map analysis
- B207. Protein-protein interaction mapping

B3. Complex protein engineering

Technologies which are utilized in protein modification, manipulation of antibodies and receptors, and protein designing

Corresponding List

- B301. Antibody engineering
- B302. Protein modification
- B303. Receptor engineering
- B304. Protein design
- B305. Complex protein formation

B4. Peptide engineering

Technologies which are utilized in synthesis, purification, designing, analysis of structure and function of peptides

Corresponding List

- B401. Peptide synthesis and purification

- B402. Peptide design
- B403. Peptide structure and function analysis
- B404. Activated peptide utilization
- B405. Multidimensional peptide separation

B5. Protein application

Technologies which develop or utilize enzymes or combinatorial biocatalysts using proteins

Corresponding List

- B501. Novel enzyme screening
- B502. Artificial enzyme production and utilization
- B503. Protein refolding
- B504. Combinatorial biocatalysis
- B505. Enzyme therapy

B0. Protein engineering, n.e.s.**C. Other macromolecule engineering**

Technologies which analyze structure and functions of biomacromolecules such as carbohydrate or lipid, and which develop valuable materials by modifying or utilizing these biomacromolecules

C1. Lipid engineering

Technologies which artificially synthesize lipids or separate them from its natural state, analyze their structure and functions, and develop valuable materials such as functional lipids by physically or biochemically modifying or processing them

Corresponding List

- C101. Functional lipid development

C2. Carbohydrate engineering

Technologies which artificially synthesize carbohydrates or separate them from

its natural state, analyze their structure and functions, and develop valuable materials such as functional carbohydrates by physically or biochemically modifying or processing them

Corresponding List C201. Polysaccharide chemistry
C202. Neoglycan technology
C203. Functional carbohydrate development

C0. Other macromolecule engineering, n.e.s.

D. Cell and tissue engineering

Technologies which are utilized to maintain, improve and recover organic functions by manufacturing and using new cells which can express valuable genetic characteristics or by producing artificial tissues or organs

D1. Stem cell therapy

Technologies which induce undifferentiated stem cells to differentiate into specific cells or tissues in appropriate *in vitro* condition and utilize them to treat injured tissues or organs

Corresponding List D101. Embryonic stem cell utilization
D102. Adult stem cell utilization
D103. Stem cell differentiation induction
D104. Regenerative medicine

D2. Bioenvironment regulation

Technologies which create *in vitro* conditions physically and chemically similar to conditions of living bodies to maximize specific functions of cells or organs

Corresponding List D201. Biological and chemical bioenvironment
D202. Physical, mechanical bioenvironment mimics
D203. Cell and biomaterials interface

D204. Hybrid tissue engineering

D3. Functional biomaterial development

Technologies which develop structurally and chemically modified functional biocompatible materials which can induce specific activities by interaction with cells and tissues in organisms

Corresponding List D301. New biomaterial development
D302. Biocompatibility enhancing technology
D303. Functional supporter development
D304. Biocompatibility material development

D4. Cell engineering

Comprehensive cellular technologies including technologies which create new cells such as hybrid cells or recombinant cells, and cell separating and culturing technologies

Corresponding List D401. Cell assays
D402. Cell microencapsulation
D403. Cell manipulation
D404. Nuclear transfer

D5. Tissue engineering

Technologies which are utilized in maintaining, developing and recovering biofunctions by manufacturing artificial tissues or organs using cells, organs and biocompatible materials

Corresponding List D501. Tissue assays
D502. Tissue microencapsulation
D503. Tissue manipulation
D504. Tissue culture

D0. Cell and tissue engineering, n.e.s.

E. System biology and bioinformatics

Technologies which study on comprehensive characteristics of living organisms by analyzing and integrating their constituents and interactions, and technologies which obtain and utilize valuable information by processing and handling living organism-originated information

E1. Gene sequence analysis

Technologies which analyze the whole genetic information of an individual by using DNA sequencer or other devices

- Corresponding List**
- E101. SNP(single nucleotide polymorphism) analysis
 - E102. cDNA library construction
 - E103. Gene-expression profile analysis
 - E104. DNA chip development and application
 - E105. High throughput screening
 - E106. Full-length cDNA cloning
 - E107. Whole genome sequence technology

E2. Functional genomics

Technologies which investigate genetic functions to obtain information required for diagnosis and prognosis prediction of diseases and for developing medicines

- Corresponding List**
- E201. Proteome related technology
 - E202. Genetic functional network analysis
 - E203. Comparative genomics
 - E204. Pharmacogenomics
 - E205. Toxicogenomics
 - E206. Gene targeting
 - E207. Transcriptomics
 - E208. Genotyping
 - E209. Haplotype profiling
 - E210. Genome-wide gene trapping
 - E211. Inverse genomics

E3. Proteomics

Technologies which investigate structure and function of specific proteins and interaction between proteins to understand cellular behavior and gene expression

- Corresponding List**
- E301. Protein display
 - E302. Protein informatics
 - E303. Cellular proteomics
 - E304. Disease-related expression profiling
 - E305. Pharmacoproteomics
 - E306. Protein chip development and application

E4. Bioinformatics

Technologies which obtain and utilize valuable information by analyzing and processing bioinformation of organisms using computer

- Corresponding List**
- E401. Biological database construction
 - E402. Data mining system development
 - E403. Biological system modeling and simulation
 - E404. Base sequence analysis and design
 - E405. Structure/function prediction
 - E406. Biological network analysis

E0. System biology and bioinformatics, n.e.s.

F. Metabolic engineering

Technologies which improve production of target metabolites or produce new metabolites by analyzing and modifying the metabolism pathway or its regulatory system

F1. Metabolite production

Technologies which industrially produce primary metabolites essential for cell growth (nucleic acids, aminoacids, vitamins, etc.) and secondary metabolites which are biosynthesized after cell growth (antibiotics, dyes, etc.)

- Corresponding List**
- F101. Primary metabolite production (amino acid, organic acid, alcohol, etc.)
 - F102. Secondary metabolite production(antibiotics, etc.)
 - F103. Production of other bioproducts (nucleic acid, lipid, protein, carbohydrate, etc.)

F2. Applications of metabolic engineering

Technologies which are utilized in improving production of target metabolites, producing new metabolites or biological degradation of non-organic materials by analyzing, modifying and redesigning the metabolic pathways and their regulatory systems

- Corresponding List**
- F201. Enhanced production of existing metabolites
 - F202. Production of novel metabolites
 - F203. Optimizing the substrate utilization
 - F204. Designing pathways for degradation of xenobiotics
 - F205. Engineering of metabolic pathways and cellular system for improving mid and downstream bioprocesses

F3. Understanding the metabolism and metabolic pathway

Technologies which analyze and informationize metabolic flux, metabolic regulatory system and metabolic networks

- Corresponding List**
- F301. Metabolic flux analysis
 - F302. Metabolic flux regulation analysis
 - F303. Metabolic network analysis
 - F304. Metabolic profiling
 - F305. Isotopomer analysis

F0. Metabolic engineering, n.e.s.

- Corresponding List**
- F001. Integration of genome, transcriptome, proteome, metabolome and fluxome
 - F002. In silico metabolic engineering

G. Bioprocess

Processing technologies such as culturing, biotransformation, recovery and purification which utilize organisms or bioderivatives for production of valuable materials or products

G1. Fermentation engineering

Microbial culturing technologies which are utilized to maximize the production of valuable materials

- Corresponding List**
- G101. Strain improvement
 - G102. High cell density culture
 - G103. Recombinant microorganism culture engineering
 - G104. Algae cell culture engineering
 - G105. Cell immobilization

G2. Cell culture engineering

Technologies utilized in optimal culturing of cell strains derived from animals, plants and insects

- Corresponding List**
- G201. Plant cell culture engineering
 - G202. Animal cell culture engineering
 - G203. Cell line development
 - G204. Plant tissue culture engineering
 - G205. Insect cell culture
 - G206. Media optimization

G3. Biotransformation

Technologies which convert precursor materials to other valuable materials by utilizing biocatalysts

- Corresponding List**
- G301. Enzyme reaction engineering
 - G302. Enzyme stabilization
 - G303. Enzyme immobilization
 - G304. Chirotechnology

G4. Bioseparation engineering

Technologies which are utilized to optimally recover and purify valuable materials produced by bioprocesses

- Corresponding List**
- G401. Filtration
 - G402. Centrifugation
 - G403. Extraction
 - G404. Adsorption
 - G405. Chromatography
 - G406. Membrane separation
 - G407. Precipitation / crystallization
 - G408. Freeze drying
 - G409. Electrophoresis
 - G410. Cell separation

G5. Industrialization

Technologies which design, analyze, optimize and manage manufacturing processes to produce living organisms or bioderivatives in industrial scale

- Corresponding List**
- G501. Scaleup technology
 - G502. Bioreactor design and fabrication
 - G503. Process design
 - G504. Process control and optimization
 - G505. Sterilization
 - G506. Cost analysis
 - G507. Process validation

- G508. Quality assurance / control
- G509. cGMP(current Good Manufacturing Practices)
- G510. GLP(Good Laboratory Practice)

G0. Bioprocess, n.e.s.

- Corresponding List**
- G001. Bioleaching
 - G002. Cryopreservation

H. Bioresource production and utilization

Technologies which produce and preserve bioresources such as animals, plants and microorganisms efficiently, and produce valuable products by separating and processing materials obtained from these bioresources

H1. Plant resource utilization technology

Technologies associated with genetic resource preserving, genetic modification, molecular breeding, cultivation, pest control, and processing and storage of agricultural products, for efficient production of plant resources

- Corresponding List**
- H101. Nuclear fusion
 - H102. Cultivation and breeding
 - H103. Transgenic plant development and molecular breeding
 - H104. Plant transformation analysis and detection
 - H105. Plant cell differentiation
 - H106. Plant gene resources analysis and preservation
 - H107. Disease and parasite protection
 - H108. Farm product quality control and storage

H2. Animal resource utilization technology

Technologies which produce products which assist preservation, breeding, growth and efficient production of animal resources, or technologies which produce valuable products by utilizing byproducts of animal resource production

Corresponding List

- H201. Nuclear fusion
- H202. Animal resource utilization
- H203. Animal breeding, development and proliferation
- H204. Transgenic animal development
- H205. Animal disease control
- H206. Experimental animal development and production
- H207. Experimental animal management and utilization
- H208. Animal feed production
- H209. Animal byproduct processing technology
- H210. Animal cell cloning technology

H3. Microbial resource utilization technology

Technologies which separate, identify and manage valuable microorganic resources or technologies which produce valuable materials by using these resources

Corresponding List

- H301. Nuclear fusion
- H302. Screening and Identification of microbial resource
- H303. isolation
- H304. Probiotic development and utilization

H4. Insect resource utilization technology

Technologies which produce valuable materials by preserving or utilizing insect resources such as insect bodies, insect cells or insect-associated microorganisms

Corresponding List

- H401. Functional insect and its material utilization
- H402. Utilization of insect organ and insect cell line
- H403. Preservation of insect resource and search for its application

H404. Utilization of insect based microorganism

H5. Marine/fresh water organism technology

Technologies which are utilized in producing valuable materials or environmental conservation by preserving, separating, breeding and utilizing bioresources associated with marine lives or limnobios

Corresponding List

- H501. Aquatic animal breeding and development
- H502. Aquatic farming
- H503. Excellent individual preservation
- H504. Aquatic microorganism utilization
- H505. Aquatic plant breeding and utilization
- H506. Aquatic organism resources screening
- H507. Aquatic environment preservation

H6. Food engineering

Technologies which produce and manage foods or food materials by discovering, assessing, processing and packaging bioresources which can be utilized as general foods or functional health foods.

Corresponding List

- H601. Food processing and packaging
- H602. Functional food material production
- H603. Food pollutant detection and management
- H604. Fermentation foods and enzyme utilization
- H605. Food quality and nutrition evaluation
- H606. Food additives development

H7. Biomaterializing technology

Technologies which produce valuable materials or assess their functions by discovering, assessing, separating, purifying, biocatalyzing and biomimicking biomaterials derived from bioresources

Corresponding List

- H701. Metabolism enhancing biomaterial screening
- H702. Biomaterial production and utilization
- H703. Biomaterial functionality evaluation

- H704. Biomaterial separation and purification
- H705. Biomimetry
- H706. Molecular high throughput screening

H8. Biodiversity conservation

Technologies which preserve and manage genetic, species and ecosystemic diversity

- Corresponding List**
- H801. Genetic diversity preservation and management
 - H802. Species diversity preservation and management
 - H803. Ecosystem diversity preservation and management
 - H804. Cryopreservation

H0. Bioresource production and utilization, n.e.s.

- Corresponding List**
- H001. Bioproduct engineering
 - H002. Life support system for closed environment

I. Environmental biotechnology and bioenergy technology

Biotechnologies which are applied to environmental area and bioenergy area such as measuring, processing and remedying pollution

I1. Clean technology

Technologies of production and management which utilize eco-friendly alternative materials and processes which can reduce energy or resource consumption or discharge of reduce environmental pollutants

- Corresponding List**
- I101. Process-related clean technology
 - I102. Biological agrochemicals development
 - I103. Biodegradable material production
 - I104. Bio-based solvent technology

I2. Environmental pollution control and management technology

Management and reducing technologies which can reduce discharge of environmental pollutants to natural environments such as water, air and earth, or can restore polluted natural environment

- Corresponding List**
- I201. Air pollution control and treatment
 - I202. Water pollution control and treatment
 - I203. Soil pollution control and remediation
 - I204. Waste treatment
 - I205. Environmental pollutants measurement and analysis
 - I206. Environmental assessment and control
 - I207. Ecosystem restoration

I3. Bioenergy technology

Technologies which produce and utilize energy-related products including electricity, fuel (liquid, solid and gaseous), heat, chemicals and other materials by using renewable resources such as biomass

- Corresponding List**
- I301. Bioethanol production using starch biomass
 - I302. Bioethanol production using lignocellulosic biomass
 - I303. Biodiesel production
 - I304. Biogas production
 - I305. Biogas utilization
 - I306. Biohydrogen production
 - I307. Biobutanol production

I0. Environmental biotechnology and bioenergy technology, n.e.s.

J. Nanobiotechnology

Technologies which control and apply biomolecules by fusing nanotechnology and biotechnology in nano scale

J1. Nano-biodevice fabrication

Technologies which compose and produce biodevices by controlling organisms or bioderivatives in nano scale

Corresponding List

- J101. Nano-DNA chip fabrication
- J102. Nano-protein chip fabrication
- J103. Nano chip production and application
- J104. Nano-bioelectronic device fabrication
- J105. Nano-biosensor system
- J106. Nano-bioactuator fabrication
- J107. Nano-biosignal analysis

J2. Nanobiomaterial technology

Technologies which produce medical and industrial materials by controlling, designing and processing organisms or bioderivatives in nano scale to utilize their biocontrol functions

Corresponding List

- J201. Biomaterial self-assembly
- J202. Biomaterial production for nanobiochip
- J203. Hybrid nanomaterial manufacturing
- J204. Bio-nanoparticle manufacturing
- J205. Bio-nanomaterial thin film fabrication

J3. Nano drug delivery system

Technologies and systems which regulate drug releasing rate by controlling particles in nano scale or improve drug delivery to target area

Corresponding List

- J301. Nanomaterial for drug delivery

- J302. Nanostructure manipulation and property analysis
- J303. Nano-carrier manufacturing
- J304. Molecular target discovery

J4. BioNEMS(Nanoelectromechanical systems), nano-LOC(lab-on-a-chip)

Technologies which produce biochips by utilizing microprocessing techniques in nano scale, and technologies which design, fabricate and produce biochips which materialize various kinds of laboratory procedures such as combination, reaction, separation and analysis

Corresponding List

- J401. Nano-fluidic
- J402. Nano-processing
- J403. Nano-lithography
- J404. Surface, interface control
- J405. Nanoscale particle manipulation
- J406. Nanoflow visualization & diagnosis

J0. Nanobiotechnology, n.e.s.

K. Bioelectronics engineering

Technologies which construct, produce and utilize biodevices on the basis of detecting functions of organisms or bioderivatives

K1. Biosensor fabrication

Technologies which design, construct and produce devices which detect and quantify specific materials by artificially materializing detecting functions of organisms or bioderivatives

Corresponding List

- K101. Biomaterial immobilization
- K102. Sensor array fabrication
- K103. Biomolecule recognition analysis
- K104. Sensor system design
- K105. Signal detection and transducing
- K106. Remote transmission

K2. Bioelectronic device fabrication

Technologies which design, construct and produce devices which detect specific materials and have data processing and storing functions by artificially materializing electron delivery and storage functions of organisms or bioderivatives

- Corresponding List**
- K201. Biofilm fabrication
 - K202. Device fabrication
 - K203. Biomemory fabrication
 - K204. Biocomputing

K3. Biochip fabrication

Technologies which fabricate chips which analyze functions of genes, proteins and cells by immobilization of organisms or bioderivatives on solid board with high density

- Corresponding List**
- K301. DNA chip fabrication and application
 - K302. Protein chip fabrication and application
 - K303. Cell chip fabrication and application
 - K304. High throughput screening
 - K305. Array fabrication
 - K306. Biodata mining
 - K307. Instrument manufacturing for biochip

K4. Microfluidics

Technologies which investigate the fluidic phenomenon in microstructures related to collecting, treating, separating and transferring materials in biochips and lab-on-a-chip

- Corresponding List**
- K401. Plastic microfabrication
 - K402. Microfluidic transport
 - K403. Low Reynolds number flow
 - K404. Multiscale flow simulation
 - K405. Microflow driving & manipulation
 - K406. Micro/nanoscale particle manipulation
 - K407. Microflow visualization & diagnosis

K0. Bioelectronics, n.e.s.

L. Biosafety and efficacy evaluation

Technologies which evaluate potential risks or biologic efficacy of biotechnologies and biotechnological products

L1. Safety evaluation

Technologies related to evaluation methods and tools of risks of biotechnologies and biotechnological products

- Corresponding List**
- L101. Medicine, cosmetics safety evaluation
 - L102. Food and food additives safety evaluation
 - L103. Chemical material safety evaluation
 - L104. Biological agrochemicals safety evaluation
 - L105. Microbiological safety evaluation
 - L106. GMO safety evaluation
 - L107. Clinical trial
 - L108. Toxicity evaluation

L2. Safety management

Management technologies which reduce or block potential risks of

biotechnologies and biotechnological products

Corresponding List

- L201. Safety management
- L202. HACCP(hazard analysis critical control points)
- L203. Safety management of GMO

L3. Environmental assessment

Technologies related to establishment and evaluation of methods for minimizing or avoiding influence on environment and technologies related to evaluation of influence on natural/life environment, social/economic environment and culture before initiating works which have potential influence on environment

Corresponding List

- L301. Environmental assessment of natural disaster
- L302. Environmental assessment of chemicals
- L303. Environmental assessment of radioactive materials
- L304. Environmental assessment of synthetic resins and petroleum products
- L305. Environmental assessment of magnetism
- L306. Evaluation and management of GMO
- L307. Biodegradability evaluation

L4. Biohazard management

Technologies which prevent, manage and restore disasters which are caused by leakage of toxic materials, pathogens and biotechnological organisms or man-made changes on ecosystem to cause serious influence on mankind and ecosystem

Corresponding List

- L401. Safety management of chemicals
- L402. Safety management of radioactive materials
- L403. Biohazard management caused by natural disaster
- L404. Biological remediation restoration using microorganisms
- L405. Biohazard management caused by bio-weapons

L5. Efficacy evaluation

Technologies which evaluate efficacy of materials which enhance or inhibit activities of human body, organisms or bioderivatives

Corresponding List

- L501. *In vitro* assay
- L502. *In vivo* assay
- L503. Pharmacokinetic evaluation
- L504. Preclinical trial
- L505. Clinical trial I
- L506. Clinical trial II
- L507. Clinical trial III
- L508. Clinical trial IV

L0. Biosafety and efficacy evaluation, n.e.s.

M. Other biotechnology

M1. Combinational biology

Technologies which secure molecular diversity from genetic information on the basis of genetic recombination and select potential candidate materials of specific activities, and secure their genetic information

Corresponding List

- M101. Shape library construction
- M102. Hybrid polyketide antibiotics development

M2. Drug delivery

Technologies which minimize adverse reactions of drugs and maximize effects and efficacy of drugs by regulating drug release rate or facilitating drug delivery to target area

Corresponding List

- M201. Controlled release formulation
- M202. Biomaterials for drug delivery
- M203. Structure manipulation and property analysis
- M204. Carrier development
- M205. Molecular target discovery

M3. Immunotherapy

Technologies which treat diseases using in vivo immune system by producing, modifying and activating materials and cells related to in vivo immunity

Corresponding List

- M301. Immunomodulator
- M302. Immunotherapeutics
- M303. Targeted immunotherapy

M0. Biotechnology, n.e.s.

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