

### Identification

Please fill out this module once the questionnaire on Innovation in companies 2013 has been completed

## A. Current use of biotechnologies

Biotechnology comprises the application of science and technology to living organisms, as well as to their parts, products and models, in order to alter living or inert material, for the purpose of producing knowledge, goods and/or services

### A.1 Does your unit currently use any of the biotechnologies shown below?

|   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| 1. Genetic code. Technologies referring to DNA  | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Technologies referring to proteins, amino acids, enzymes and other molecules, as well as hormones and growth factors   | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Cultures and cell and tissue engineering, immune response stimulants or vaccines, handling of embryos  | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Bio-processes: use of micro organisms, bacteria, viruses, fungi, mould, yeast, microbial processes (bio-reactors, fermentation, bio-leaching, bio-pulping, bio-whitening, bio-desulphurisation, bio-remedying and bio-filtering) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Sub-cellular organisms (gene therapy and viral vectors)  | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Bio-computing (construction of genome databases, protein sequences; modelling complex biological processes, including systems biology)   | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Nano-biotechnology (application of instruments and processes of nano/micro-manufacturing for construction of apparatus for studying biosystems and applications in breaking drug-addiction, diagnoses etc.)                      | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Others (specify):  | <input type="checkbox"/> | <input type="checkbox"/> |

### A.2 The activity or activities related to biotechnology carried out in their unit are:

1. Main and/or exclusive ☐ 2. A secondary line of business ☐ 3. Tool necessary for the production process ☐

In the case of marking option 2, please indicate the percentage dedicated to biotechnology    %

A company that allocates at least 75% of its economic and human resources to Biotechnology shall mark option 1.

### A.3 Please indicate the area(s) of final application of products obtained from use of previous biotechnologies

|  | YES                      | NO                       |
|--|--------------------------|--------------------------|
| 1. <u>Human health</u> : diagnosis, molecular therapy, advanced therapies, biological technologies supporting discovery and development of pharmaceuticals | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. <u>Animal health and aquaculture</u> : diagnosis, molecular therapy, animal production  | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. <u>Food</u> : diagnosis, food bio-processes, additives/ingredients, others  | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. <u>Agriculture and forest production</u> : biological control, culture and propagation techniques, new varieties, diagnosis, others                     | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. <u>Environment</u> : diagnosis, environmental management  | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. <u>Industry</u> : biofuels, industrial bio-processes, others  | <input type="checkbox"/> | <input type="checkbox"/> |

## B. Internationalisation of activities relating to biotechnology

### B.1 In relation to activities based on biological sciences and technologies, did your unit have income of an international origin during 2013?

YES ☐ NO ☐ ⇒ Go to section C  
↓

### B.2 Of turnover for 2013, please indicate the amount represented by income of an international origin related to activities based on biological sciences and technologies

Value (€ without decimals)

Income of an international origin \_\_\_\_\_

Of the previous figure, indicate the percentage represented in 2013 by income from...

... EU \_\_\_\_\_ %  
... all other countries \_\_\_\_\_ %  
**TOTAL**

|   |   |   |
|---|---|---|
| 1 | 0 | 0 |
|---|---|---|

 %

### B.3 Distribution of turnover of an international origin related to activities based on biological sciences and technologies

Breakdown, as a percentage, of the figure listed in B.2 according to the following classification. (Do not write decimals, and check that the sum of the column is 100%).

1. International trade in products and services (including research by contract) \_\_\_\_\_ %  
2. Milestones, royalties, sale or licensing of technologies outside Spain \_\_\_\_\_ %  
3. Subsidies of foreign origin (framework programme, multilateral funds, etc.) \_\_\_\_\_ %  
4. Other (specify) \_\_\_\_\_ %  
**TOTAL**

|   |   |   |
|---|---|---|
| 1 | 0 | 0 |
|---|---|---|

 %

## C. Resources intended for R&D in biotechnology in 2013

### C.1 Has your unit carried out internal R&D activities related to biotechnology?

YES ☐ NO ☐ ⇒ Please go to section C.5  
↓

### C.2 Staff at the unit working in R&D activities in biotechnology (annual average)

|   | Total | Women | Total (FTE)<br>(1 decimal) | Women (FTE)<br>(1 decimal) |
|---|-------|-------|----------------------------|----------------------------|
| 1. R&D researchers in biotechnology _____                   | _____ | _____ | _____                      | _____                      |
| 2. Technicians and assistants in R&D in biotechnology _____ | _____ | _____ | _____                      | _____                      |
| <b>TOTAL STAFF IN R&amp;D IN BIOTECHNOLOGY (1+2)</b>        | _____ | _____ | _____                      | _____                      |

#### C2.1. Hiring of external consultancy to carry out internal R&D activities in 2013

Out of the preceding TOTAL PERSONS, please indicate the number of external consultants working in situ, if any \_\_\_\_\_

Out of the preceding TOTAL FTE, please indicate the number of external consultants working in situ \_\_\_\_\_

### C.3 Expenditure in internal biotechnology R&D activities in 2013

Expenses on remunerations are those corresponding to the total paid to the researchers on FTE and to the total technicians and assistants on FTE specified in C.2. For the rest of the items in this section, expenditure will be calculated as a percentage of the part that corresponds to R&D.

|  | Value (€ without decimals) |
|--|----------------------------|
| 1. Remuneration of researchers on FTE (this includes the remuneration of the interns)  |                            |
| 2. Remuneration of technicians and assistants on FTE   |                            |
| 3. Other current expenses (without VAT or amortizations)   |                            |
| 3.1. Out of the previous figure, please indicate the total cost of the hiring of external consultants working "in situ" to carry out internal biotechnology R&D activities |                            |
| <b>A. Total current expenses on R&amp;D (1+2+3)</b>  |                            |
| 4. Equipment and instruments (without VAT)   |                            |
| 5. Land and buildings (without VAT)  |                            |
| 6. Acquisition of specific software for R&D (including licence instalments) (without VAT)  |                            |
| <b>B. Total capital expenses on R&amp;D (4+5+6)</b>  |                            |
| <b>C. TOTAL (A+B)</b>  |                            |

### C.4 Origin of funds for internal R&D activities in biotechnology in 2013

Breakdown of the total internal expenses on biotechnological R&D from question C.3.C, according to the original source of the funds received. In the case of public funds for carrying out biotechnological R&D, we must distinguish between subsidies (including non-refundable loans) and contracts (and purchases) with the Administration. Refundable loans for carrying out biotechnological R&D obtained from both the Administration and other sources, shall be included as their own funds.

| Origin of the funds  | Value (€ without decimals) |
|--|----------------------------|
| <b>A. Financing by the company itself</b>                                |                            |
| - Own funds  |                            |
| - Loans  |                            |
| <b>B. Financing from other Spanish companies</b>                         |                            |
| - From companies in the same group                                       |                            |
| - From other public companies  |                            |
| - From other private companies and research associations                 |                            |
| <b>C. Public financing</b>   |                            |
| - Subsidies from the Central State Administration and dependent entities |                            |
| - Contracts with the Central State Administration and dependent entities |                            |
| - Subsidies from the Autonomous Community and Local Administrations      |                            |
| - Contracts with the Autonomous Community and Local Administrations      |                            |
| <b>D. Other national sources</b>   |                            |
| - From universities  |                            |
| - From private non-profit institutions                                   |                            |
| <b>E. Funds from abroad</b>  |                            |
| - From foreign companies in the same group                               |                            |
| - From other foreign companies   |                            |
| - From European Union programmes   |                            |
| - From foreign Public Administrations                                    |                            |
| - From foreign universities  |                            |
| - From foreign private non-profit institutions                           |                            |
| - From other international organisations                                 |                            |
| <b>TOTAL (must coincide with C.3.C)</b>                                  |                            |

## C.5. Expenditure on external biotechnology R&D activities in 2013

This is expenditure motivated by the acquisition of R&D services in biotechnology outside the body or centre by means of purchase, contract, agreement, etc. This does not include institutional fees for financing other public or private, international organisations, ... not involving a direct purchase of R&D in Biotechnology

Value (€ without decimals)

### A. Purchase of R&D in biotechnology in Spain (without VAT)

1. To companies in the same group \_\_\_\_\_
2. To other companies \_\_\_\_\_
3. To research associations \_\_\_\_\_
4. To Public Administration organisations (including hospitals) \_\_\_\_\_
5. To universities \_\_\_\_\_
6. To private non-profit institutions \_\_\_\_\_

### B. Purchase of R&D in biotechnology abroad (without taxes)

1. To foreign companies in the same group \_\_\_\_\_
2. To other foreign companies \_\_\_\_\_
3. To institutions from foreign Public Administrations \_\_\_\_\_
4. To foreign universities \_\_\_\_\_
5. To foreign private non-profit institutions \_\_\_\_\_
6. To other international organisations \_\_\_\_\_

### C. Total purchase of R&D in biotechnology (A+B) \_\_\_\_\_

## D. Obstacles to the development of biotechnologies

(Please mark with a cross (x) the appropriate alternatives)

|  | High                     | Medium                   | Low                      | Does not know            |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Resources / Contributions for biotechnology         |                          |                          |                          |                          |
| 1.1. Access to capital _____                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.2. Access to technology / information _____          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.3. Access to human resources _____                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Biotechnology markets                               |                          |                          |                          |                          |
| 2.1. Disconnection from the value chain _____          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.2. Lack of access to international markets _____     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3. Lack of distribution and marketing channels _____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Limitations   |                          |                          |                          |                          |
| 3.1. Public acceptance / awareness _____               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.2. Legal and regulatory requirements _____           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.3. Time / cost _____                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.4. Difficulty accessing patenting _____              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## E. Intellectual property protection

### E.1 During the period 2011-2013, did the company apply for any patents to protect its inventions or innovations or innovations related to biotechnology?

NO ☐ YES ☐ ⇒

• Indicate the number of patents requested between 2011-2013 (the same patent presented in different offices shall only be counted once) \_\_\_\_\_

• Indicate the number of patents requested between 2011-2013, according to the type of patent

OEPM Patent \_\_\_\_\_

EPO Patent \_\_\_\_\_

USPTO Patent \_\_\_\_\_

PCT Patent \_\_\_\_\_

OEPM: Spanish Patent and Trademark Office. EPO: European Patent Office. USPTO: U.S. Patent and Trademark Office. PCT: Patent Cooperation Treaty

### E.2 Licences related to biotechnology in the year 2013

Please indicate the number of licences acquired and/or granted in 2013, according to type:

Licence IN \_\_\_\_\_ Licence OUT \_\_\_\_\_

Licence IN: Acquisition of a licence or right to use a biotechnology product or technology for R&D, industrial and commercial activities.

Licence OUT: Granting of a licence or right to use a biotechnology product or technology for R&D, industrial and commercial activities.

## Annex

### 1. Biotechnology applications

#### 1.1 Red or health biotechnology

Biotechnology applied to medical processes (human and animal health), in both the therapeutic field and in the diagnosis of illnesses. Biotechnology is customarily identified with genetics, but there are other useful and important applications of this scientific area, such as the development of medication.

##### EXAMPLES: BIOTECHNOLOGY USE IN MEDICINE

- a) Production of antibiotics, vaccinations and serums, through the use of micro organisms (moulds, bacteria, etc.).
- b) Production of other substances, such as hormones.
- c) Some blood coagulation factors or certain enzymes, used in pharmaceutical products, may be obtained from the culture of micro organisms in which the genes of interest have been inserted.
- d) In regenerative therapies: such as the use of biomaterials for bone regeneration. The term "biomaterial" refers to those pharmacologically inert materials used in the manufacture of devices that are to be implanted within a living being and that will interact with that living being.

#### 1.2 Green or food and agriculture biotechnology

##### Agricultural biotechnology

Biotechnology applied to agricultural processes.

##### Food biotechnology

The set of techniques or processes that use living organisms or substances that come from them, in order to produce or modify a food, improve the plants or animals from which the food comes, or develop micro organisms that intervene in the preparation thereof.

Through biotechnological processes, it is possible to improve the physical and chemical characteristics of plants and animals, as well as the sensory and nutritional properties of foods.

Micro organisms such as bacteria, fungi or yeast are the active agents in the transformation of foods. Likewise, these micro organisms are selected and improved, seeking adequate characteristics.

Foods may also be subjected to non-denaturalising biotechnological processes that preserve the original biological properties of the species or bioprocesses that improve their preservation.

##### EXAMPLES: BIOTECHNOLOGY USE IN AGRICULTURE AND FOOD

- a) New or improved seed varieties; fruit and horticultural varieties that require less use of agrochemicals and are more resistant to pathogens; more flavourful fruit, vegetables and pulses.
- b) In the horticultural field: coloured varieties that are impossible to obtain through crossing or hybridisation.
- c) Nutraceuticals: foods with more vitamins and minerals; probiotic foods: with significant physiological effects.
- d) Processes such as the production of beer, bread, wine, cheese or yoghurt imply the use of bacteria or yeast. The use of enzymes in the manufacture of juice.
- e) In bread baking: the use of enzymes to whiten flour, to improve its behaviour in kneading or the plasticity of the dough.
- f) Production of glucose- or fructose-rich syrups, used as sweeteners in foods and beverages.
- g) Use of biosensors (devices built with at least one component of a biological nature) in any state of food production, as in the control of raw materials. Diagnosis kits for the detection of pathogens in foods.

#### 1.3 White or industrial technology

Combination of biotechnology and biochemical processes. The main objective is to create easily degradable products that consume less energy and generate less waste during production.

##### EXAMPLES: BIOTECHNOLOGY USE IN INDUSTRY

- a) Chemical compounds and enzymes, synthesised by micro organisms, for producing valuable chemical products or destroying hazardous chemical pollutants. Some basic chemical products may be obtained by fermentation.
- b) The soap and detergent industry uses enzymes and products derived from biomass. Many oils and fats used in soaps are from a vegetable or animal origin, and many detergents contain enzymes that are produced by natural micro organisms or by organisms that are genetically modified.
- c) Biotechnology processes, employing bacteria, enzymes and other micro organisms, used in cosmetics and dermatopharmaceuticals.
- d) In paper manufacturing, cellulose may also be obtained by bacterial synthesis. Through biotechnological procedures, it is possible to increase the cellulose production in trees, and the quality of the fibres, as well as decrease the energetic and chemical costs in paper production. For recycling paper, enzymes can also be used, which are used in bio-whitening as well.
- e) Textile industry. Improvement in natural fibres; obtaining new natural-origin fibres through proteins, or synthetic-origin fibres.
- f) Production of biodegradable compounds, such as bioplastics, using bacteria.

- g) Production of bioenergy: biofuels, such as biomass, biodiesel, using vegetable oils; bioalcohol using cane sugar; conversion of sugars into ethanol; biogases; biobatteries.

- h) Wastewater filtering; use of micro organisms for the decomposition of petroleum.

#### 1.4 Blue or sea biotechnology

Biotechnology developed in marine and aquatic environments. Identification and study of natural marine substances as the basis for new products that are useful in sectors such as the pharmaceutical, food, cosmetic sectors, etc.

##### EXAMPLES: BLUE BIOTECHNOLOGY USE

- a) Fertilisation of ponds to increase the availability of the fodder. Micro seaweed constitutes a source of new and diverse products, such as biopolymers, colourings, and different therapeutic substances.