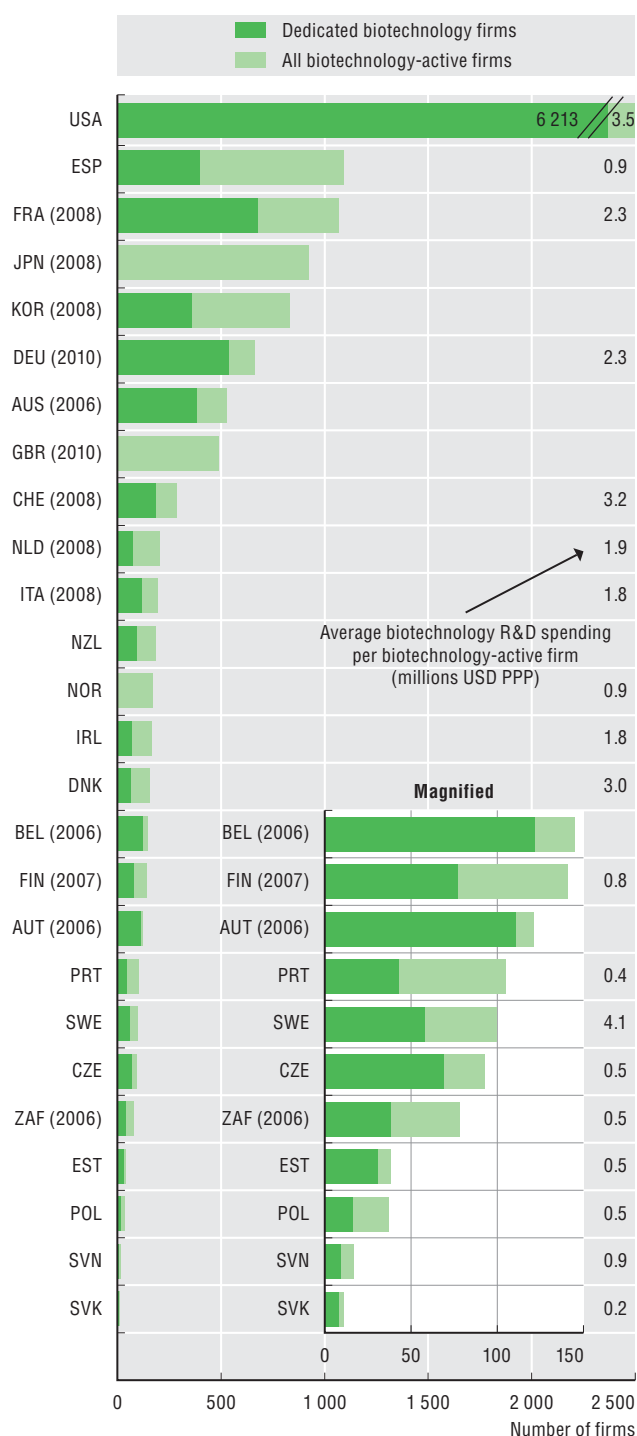


## 8. Biotechnology R&amp;D

Number of firms active in biotechnology, 2009



Source: OECD, Biotechnology Statistics Database, May 2011. See chapter notes.

StatLink <http://dx.doi.org/10.1787/888932487001>

The economic, environmental and social impacts of advances in the life sciences create policy interest in relevant economic and innovation indicators of biotechnology.

The number of biotechnology firms is the most widely available indicator but not the best measure of a country's effort, owing to large differences in firm sizes. The United States has the most biotechnology-active firms (6 213), followed by Spain (1 095) and France (1 067).

Business enterprise research and development (BERD) expenditures on biotechnology provide a better measure of the research effort. In Sweden, every biotechnology-active firm spent an average of USD 4.1 million PPP on biotechnology R&D, followed by the United States, Switzerland and Denmark (all between USD 3.5 million and USD 3.0 million PPP).

The United States spends the most on biotechnology BERD (USD 22 030 million PPP), approximately 7% of total US BERD. It accounts for almost 70% of total biotechnology BERD expenditures in the 23 countries for which data are available.

Business expenditure on biotechnology R&D as a share of total business sector R&D expenditure is an indicator of a country's research effort. On average, it accounted for 5.7% of BERD in 2009. Ireland spends the most as a percentage of BERD (15.1%). Belgium and Switzerland follow with 12.6%.

Although most biotechnology firms have fewer than 50 employees, most biotechnology R&D is performed by firms with over 50 employees. For the United States and France, which spend the most on biotechnology R&D, approximately 88% of all biotechnology R&D was performed by firms with over 50 employees.

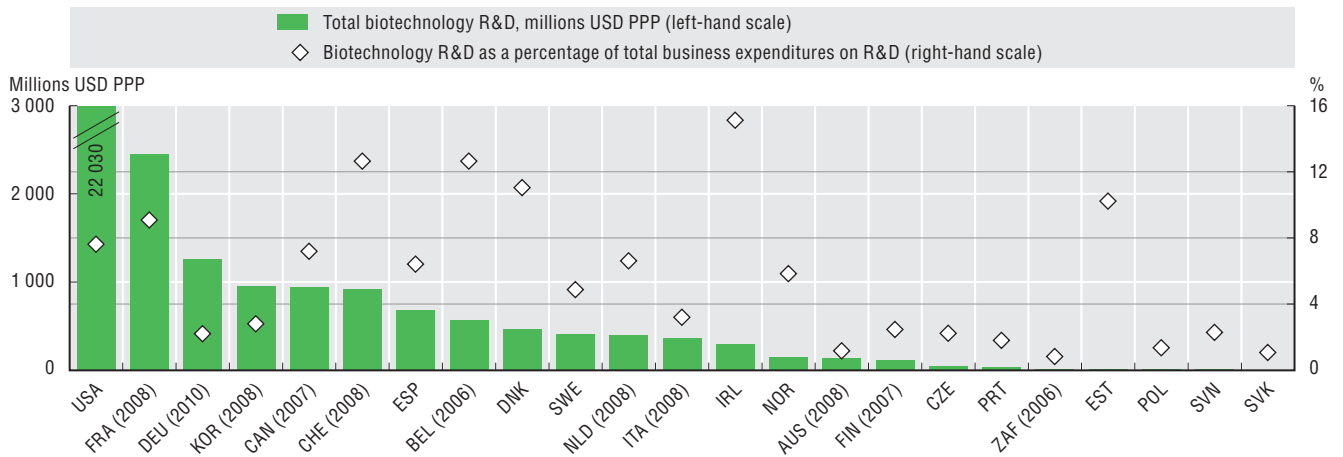
### Definitions

The OECD has both a single definition and a list-based definition of biotechnology. The single definition is broad. It covers all modern biotechnology but also many traditional or borderline activities. For this reason, the single definition should always be accompanied by the list-based definition. The single definition is:

“The application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.”

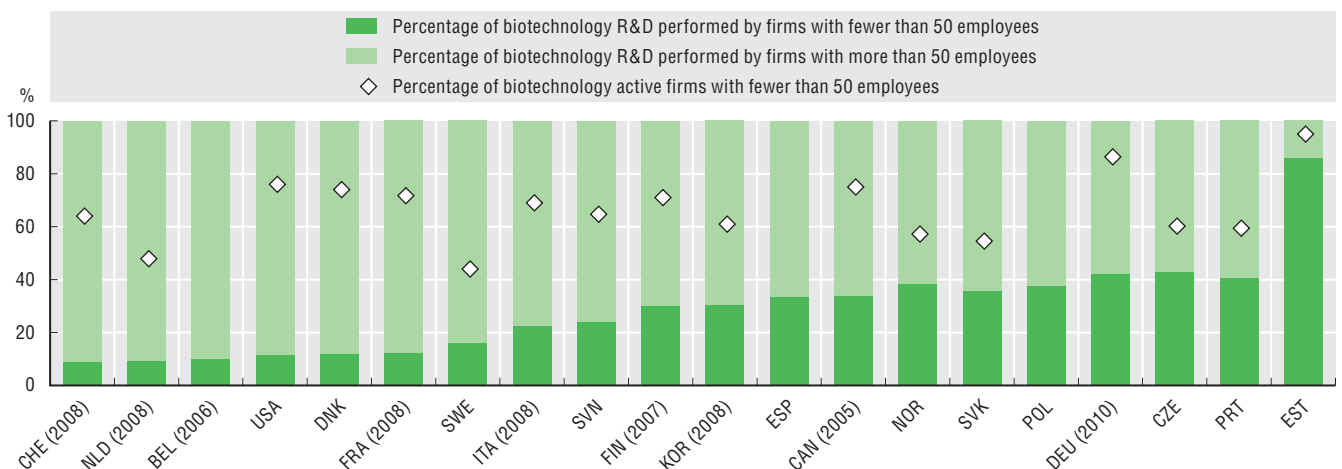
The (indicative) list-based definition has seven categories and serves as an interpretative guideline to the single definition. Respondents are usually given a write-in option for new biotechnologies that do not fit in any category. A firm that reports activity in one or more categories is defined as a biotechnology firm. The categories are: DNA/RNA, proteins and other molecules, cell and tissue culture and engineering, process biotechnology techniques, gene and RNA vectors, bioinformatics, and nanobiotechnology.

## Total biotechnology R&amp;D expenditures in the business sector, 2009



Source: OECD, Biotechnology Statistics Database, May 2011; and OECD, Main Science and Technology Indicators Database, May 2011. See chapter notes.  
 StatLink <http://dx.doi.org/10.1787/888932487020>

## Biotechnology R&amp;D expenditures by size class, 2009



Source: OECD, Biotechnology Statistics Database, May 2011. See chapter notes.

StatLink <http://dx.doi.org/10.1787/888932487039>

## Measurability

Data comparability depends on how biotechnology statistics are collected. Biotechnology activities can be measured in three ways:

- Dedicated surveys of firms active in biotechnology.
- Adding questions on biotechnology to national R&D firm surveys.
- Constructing databases with information on biotechnology firms from secondary sources and/or data-linking exercises.

Biotechnology firms can be broken down into three types:

1. Biotechnology firm: A firm engaged in biotechnology using at least one biotechnology technique (as defined in the OECD list-based definition) to produce goods or services and/or to perform biotechnology R&D. These firms are captured by biotechnology firm surveys.

Two subgroups are largely defined by the data collection method.

2. Dedicated biotechnology firm: Firms whose main activity involves the application of biotechnology techniques to produce goods or services and/or to perform biotechnology R&D. These firms are captured by biotechnology firm surveys.
3. Biotechnology R&D firm: Firms that perform biotechnology R&D. Dedicated biotechnology R&D firms, a subset of this group, are firms that devote 75% or more of their total R&D to biotechnology R&D. These firms are captured by R&D surveys.



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