

## BIOTECHNOLOGY

Spending on biotechnology research and development (R&D) by the business enterprise sector within a country is a measure of this country's research focus on biotechnology.

### Definition

The OECD developed both a single definition and a list-based definition of biotechnology. The single definition is deliberately 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, not exhaustive) list-based definition, which serves as an interpretative guideline to the single definition includes seven categories, and respondents are usually given a write-in option for new biotechnologies that do not fit any of the categories. 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.

### Comparability

Data availability and comparability depends on how each country collects biotechnology statistics.

A biotechnology firm is a firm engaged in biotechnology using at least one biotechnology technique to produce

goods or services and/or to perform biotechnology R&D. Some firms may be large, with only a small share of total economic activity attributable to biotechnology.

Countries that collect biotechnology statistics through their R&D surveys may underestimate biotechnology activity by firms, as firms that use biotechnology but do not perform biotechnology R&D are excluded.

Although every effort has been made to maximise comparability across countries, caution must be used in comparing biotechnology activities among countries when the data are obtained from studies with very different methodologies.

### Sources

- Key Biotechnology Indicators, [www.oecd.org/sti/biotechnology/indicators](http://www.oecd.org/sti/biotechnology/indicators).

### Further information

#### Analytical publications

- OECD (2012), *Knowledge Networks and Markets in the Life Sciences*, OECD Publishing.
- OECD (2011), *Future Prospects for Industrial Biotechnology*, OECD Publishing.
- OECD (2011), *OECD Science, Technology and Industry Scoreboard*, OECD Publishing.
- OECD (2009), *OECD Biotechnology Statistics 2009*, OECD Publishing.

#### Methodological publications

- OECD (2009), "Guidelines for a Harmonised Statistical Approach to Biotechnology Research and Development in the Government and Higher Education Sectors", OECD Working Party of National Experts on Science and Technology Indicators, unclassified document DSTI/EAS/STP/NESTI(2009)1/FINAL.
- OECD (2005), "A Framework for Biotechnology Statistics", OECD Working Party of National Experts on Science and Technology Indicators.
- OECD (2002), *Frascati Manual 2002: Proposed Standard Practice for Surveys on Research and Experimental Development, The Measurement of Scientific and Technological Activities*, OECD Publishing.

### Websites

- OECD Key Biotechnology Indicators, [www.oecd.org/sti/biotechnology/indicators](http://www.oecd.org/sti/biotechnology/indicators).

### Overview

The United States spends the most on biotechnology Business Enterprise R&D (BERD), PPP USD 22 030 million or approximately 7.8% of total US BERD. This accounts for almost 64% of total biotechnology BERD expenditures in the 26 countries for which data are available.

Biotechnology BERD as a share of total BERD is an indicator of country's research focus on biotechnology. On average, biotechnology BERD accounted for 5.7% of total BERD. Ireland spends the most as a percentage of BERD (15.1%). Belgium and Switzerland follow, both recording BERD spending of 12.6%.

Biotechnology R&D intensity (biotechnology R&D as a percentage of industry value added) is highest in Denmark (0.388%), followed by Switzerland (0.369%) and Belgium (0.258%).

## Biotechnology R&amp;D expenditures in the business sector

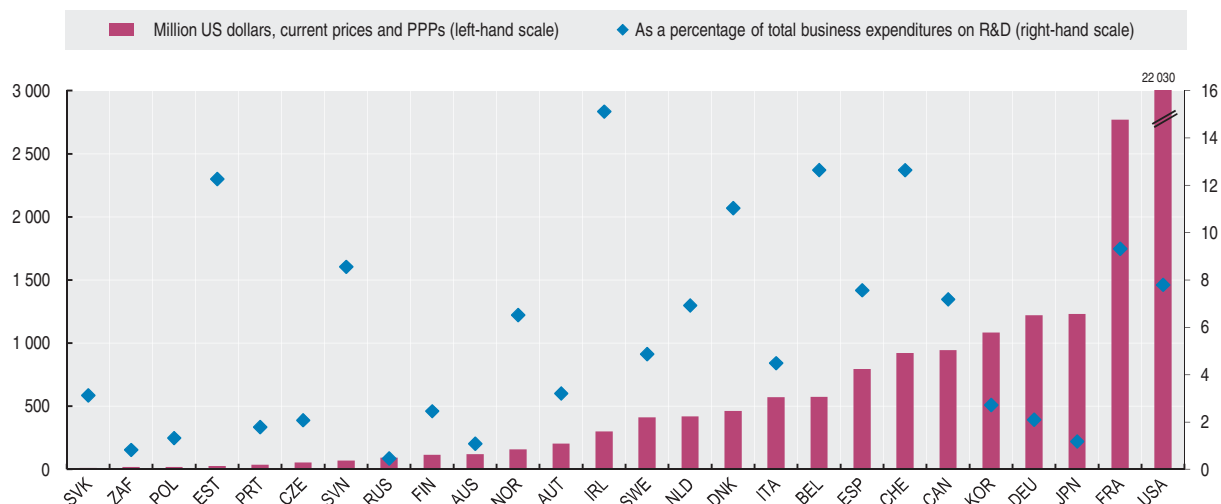
2010 or latest available year

	Million US dollars, current prices and PPPs	As a percentage of total business enterprise R&D	As a percentage of industry value added
Australia	119.3	1.1	0.020
Austria	203.4	3.2	0.093
Belgium	574.0	12.6	0.258
Canada	944.5	7.2	0.109
Chile	..	..	..
Czech Republic	53.6	2.1	0.029
Denmark	463.7	11.0	0.388
Estonia	27.3	12.3	0.145
Finland	115.6	2.5	0.097
France	2 769.3	9.3	0.220
Germany	1 221.5	2.1	0.062
Greece	..	..	..
Hungary	..	..	..
Iceland	..	..	..
Ireland	301.6	15.1	0.244
Israel	..	..	..
Italy	572.4	4.5	0.049
Japan	1 230.1	1.2	0.043
Korea	1 082.7	2.7	0.114
Luxembourg	..	..	..
Mexico	..	..	..
Netherlands	420.2	6.9	0.095
New Zealand	..	..	..
Norway	158.6	6.5	0.085
Poland	19.6	1.3	0.004
Portugal	36.9	1.8	0.024
Slovak Republic	10.9	3.1	0.011
Slovenia	69.2	8.6	0.185
Spain	794.1	7.6	0.079
Sweden	411.3	4.9	0.194
Switzerland	922.3	12.6	0.369
Turkey	..	..	..
United Kingdom	..	..	..
United States	22 030.0	7.8	0.256
EU 27	..	..	..
OECD	..	..	..
Brazil	..	..	..
China	..	..	..
India	..	..	..
Indonesia	..	..	..
Russian Federation	91.8	0.5	0.005
South Africa	19.0	0.8	0.006

StatLink <http://dx.doi.org/10.1787/888932708978>

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

2010 or latest available year

StatLink <http://dx.doi.org/10.1787/888932708997>



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