

**Highlights from
*The Use of Biotechnology in U.S. Industries,***

Biotechnology businesses and business lines are resilient and robust, despite the fact that 56% of respondents reported either no or negative operating income in 2001. (p.69)

- Biotech-related R&D accounted for about 10% of U.S. industry R&D in 2001. R&D intensity (the ratio of R&D expenditures to net sales) for biotech business lines was 33%, almost 3 times as much as the next most-intensive sector. National R&D intensity averaged 4% in 2000. (pp.73, 77)
- Average annual growth in net sales for biotech operations exceeded growth of overall business operations (10.3% v. 5.9% for 2000-02). (p.67)
- Value added of biotech business lines was at least \$33.5 billion in 2001 or .33% of GDP; the value added for entire businesses was at least 2.7% of U.S. GDP. (p.67)

The value of biotechnology is likely to increase significantly in the future. Firms reported more than 33,000 pending biotech-related patent applications, compared to about 24,000 currently held. (p.9)

Most biotech firms are small and medium-size enterprises. The majority of respondents (90%) reported 500 or fewer employees. About one-quarter of firms reported 10 or fewer employees; about 59% of firms reported 50 or fewer employees. (p.17)

Small firms reported a pattern of R&D funding that more often included venture capital and angel investors. About 56% of respondents participated in some kind of government program and 34% participated in the Small Business Innovation Research (SBIR) program. (p.19)

Exports are an important business strategy for most firms and account for about half of all biotechnology-related sales for firms with fewer than 500 employees. (p.19)

Growth in firms' technical biotechnology workforce far exceeded growth in national employment in 2000-2002. The fastest growing biotech-related technical occupation was R&D-focused computer specialists, a category that grew at an annual rate of 21.8% during 2000-2002. Firms reported hiring these types of workers from abroad more often than any other category. However, foreign outsourcing of jobs is not common.(pp.82, 86)

Firms in many different industries are engaged in developing and applying biotechnologies, although 72% of respondents' primary biotechnology activities were concentrated in human health applications. Human health-focused companies reported therapeutics and diagnostics as leading areas of interest. (p.26)

Other primary and secondary application areas identified by respondents included: 12-14% of firms in each of three areas (animal health, agriculture or marine-related activities, or industrial and food processing) and 4-5% of firms in each of two areas (microbial and environmental-related activities). (p. 9) About 10% of firms reported that they have held defense-related contracts within the past 5 years. (p.61)

Barriers to growth (as identified by all respondents) – regulatory approval process and associated costs, access to start up capital, patent process and fees and the complexity and cost of dealing with third party IP rights. Other barriers include antiquated rules and regulations (identified by environmental firms) and public acceptance and ethical considerations (agricultural firms). Also mentioned by more than one-quarter of firms – lack of understanding/interest by USG policymakers and liability concerns. (p.89)

BACKGROUND

TA/OTP identified the importance of a biotech survey effort in 2001. At that time there were no comprehensive federal industry statistics about the use and development of this important technology and its contributions to the U.S. economy – unlike virtually every other industry and service in our economy. **The goals of this project were:**

- to better support industries' innovation and competitiveness by providing accurate information to policymakers. For example, to
 - understand more about the characteristics of biotechnology firms and the types of businesses engaged in biotechnology
 - measure the contribution of biotech activity to the US economy, productivity, national security
 - identify barriers to growth and innovation
- to assist U.S. statistical agencies in developing an approach for measuring biotechnology activity

This comprehensive survey was a collaborative effort across government and between government and industry. The survey was developed and field-tested in consultation with other federal and state policymakers, the Biotechnology Industry Organization (BIO), and U.S. firms. Four DOC bureaus (TA, BIS, ITA, and ESA) and the Department of Labor contributed to this report.

The survey was mailed to over 3,000 businesses operating in the U.S. More than 1,000 firms identified themselves as biotech firms and provided robust data. Data were not collected from government organizations, universities, or foreign businesses.

For a copy of *The Use of Biotechnology in U.S. Industries* call 202-482-3037 or visit www.technology.gov/reports.htm

November 13, 2003
