



The Global Biomedical Industry: Preserving U.S. Leadership

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Biomedical innovation is an intricate process that begins in the lab and spans years of effort to transform scientific discoveries into vaccines, diagnostics, devices, and therapies that improve patients' lives. Over the past few decades, the United States has created and refined a remarkably productive framework for developing new biomedical innovations and bringing them to the marketplace—in fact, it's one of the most dramatic success stories written by any American industry in the past century. Whether measured by international or domestic market share, revenue, jobs, number of regulatory approvals, patents, R&D expenditures, or publications in the biomedical field, the U.S. holds a commanding position.

Prior to 1980, European firms defined the industry, both in terms of market presence and in their ability to create and produce innovative new products. Historical advantages and an enviable concentration of resources fueled the success of firms in Germany, France, the U.K., and Switzerland. Japan had a presence in the industry as well.

But beginning in the 1980s, the United States surged to the forefront of biomedical innovation. This sudden and remarkable shift was no accident: It was the result of strong policy positions taken by the federal government. The absence of price controls, the clarity of regulatory approvals, a thoughtful intellectual property system, and the ability to attract foreign scientific talent to outstanding research universities put the U.S. on top.

The resulting ecosystem—defined by university-business collaborations, industry clusters, private equity finance, and entrepreneurship—far surpassed the prevailing model

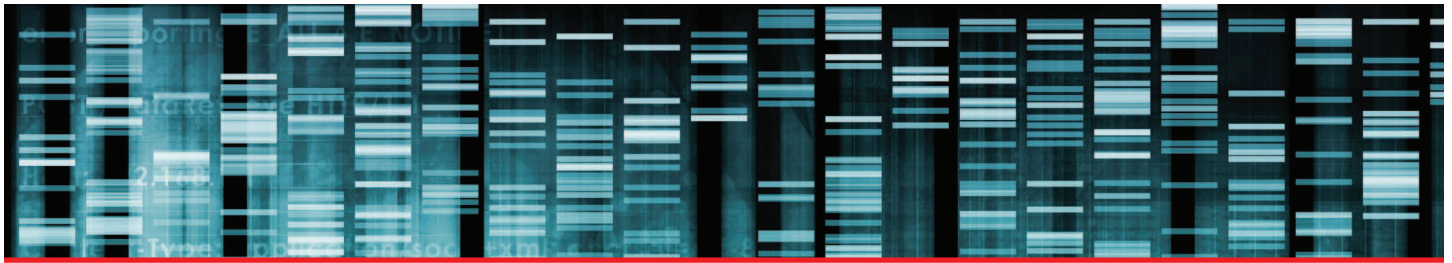
in Europe. The innovative leaps made in biopharmaceutical research, medical devices, and diagnostics gave the U.S. a major advantage that it continues to hold today.

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Based on the most recent data from the Bureau of Labor Statistics, private-sector employment in the U.S. biomedical industry in 2009 was 1,219,200. Breaking this total down into its three major components, there were 283,700 jobs in the biopharmaceutical industry; 409,200 in medical devices (including diagnostics); and 526,300 in related R&D, testing, and labs. Wages and output stemming directly from the industry comprised \$96 billion and \$213.2 billion, respectively. The average job in the U.S. biomedical industry paid \$78,600, more than 70 percent higher than the nation's average job. Once all the ripple effects of the biomedical supply chain are taken into consideration, the industry accounts for 5.3 million jobs, or 4 percent of non-farm jobs in the United States. Every job in the biomedical sector supports another 3.3 jobs elsewhere.

Size of biomedical industry: 2009			
Industry	Employment	Wages, US\$B	Output, US\$B
Biopharmaceuticals	283,700	\$29.0	\$82.4
Medical devices and equipment	409,200	\$26.5	\$59.4
Research, testing and medical labs	526,300	\$40.3	\$64.5
Total Biomedical	1,219,200	\$95.9	\$213.2

Sources: Bureau of Labor Statistics, Moody's Analytics, Milken Institute.



But U.S. industry leadership, so carefully cultivated over the past 30 years, is eroding. Europe and Japan are working to close the gap, while China, India, and Singapore have made impressive strides. In addition to improving the quantity and quality of their scientific research, competing nations are developing mechanisms to support entrepreneurs and strengthen commercialization. They are also instituting regulatory reforms and a range of public policies to improve incentives for innovation. These efforts are part of larger economic development plans that increasingly focus on cultivating biomedical innovation for its economic contributions and high-wage jobs.

Multiple factors leave the U.S. vulnerable to falling behind: increasing complexity, rigidity, and uncertainties in the Food and Drug Administration's regulatory approval process; funding cuts at the National Institutes of Health and at the state level; a corporate tax rate and R&D tax credit that are not globally competitive; unfavorable coverage and payment policies that limit access to new medical advances; and public policies that hamper the nation's ability to develop and retain human capital.

The dominance enjoyed by the U.S. biomedical industry does not come with a long-term guarantee. The U.S. assumed the mantle of leadership by being the first to commercialize recombinant DNA research—and that achievement was made possible only because it had built an environment and infrastructure that allowed innovation to flourish. But if another nation duplicates or improves upon this formula by building a similar ecosystem and subsequently makes a pivotal scientific breakthrough in nanotechnology, personalized medicine, embryonic stem cell research, or some other cutting-edge field, it could tip the scales in the other direction. That scenario is a real possibility: While the U.S. led with 29.7 percent of

nanotech-related patents granted between 1996 and 2008 (as measured by resident country of first-name inventor), China was a close second, with 24.3 percent of these patents.

Many countries are actively building the infrastructure for biomedical research and courting the private-sector operations associated with it in an effort to create high-wage, high-value-added jobs. They also realize that biomedical advances enable their citizens to live longer and more productive lives.

The U.S. could retain and bolster its leadership in biomedical innovation by taking the following actions to respond to a new era of heightened global competition:

- Increase R&D tax incentives and make them permanent
- Cut corporate tax rates to match the OECD average
- Extend support for emerging biomedical research fields
- Provide adequate resources for the FDA and the NIH to expedite regulatory reviews and clinical trials
- Leverage existing strengths in medical devices
- Build human capital for biomedical innovation
- Promote and expand the role of universities by adopting best practices in technology transfer and commercialization