



15TH ANNUAL REVIEW

 **ERNST & YOUNG**

*FROM THOUGHT TO FINISH.™*

# Focus on Fundamentals

## The Biotechnology Report

**To Our Clients and Other Friends:****October 2001**

Welcome to *Focus on Fundamentals: The Biotechnology Report, Ernst & Young's 15th Annual Review*. This edition analyzes the performance of biotechnology companies in the aftermath of a record year on Wall Street in 2000. It also looks at financing, technology, business, and public policy trends shaping biotech's future.

Despite a downturn in the capital markets in the first half of 2001, this year's Ernst & Young review shows biotech companies are poised to achieve long-term success. Companies are in the strongest financial shape ever. Their technology capabilities are progressing rapidly, pushing applications beyond health care into many other industry sectors, including agriculture, industrial manufacturing, environmental management, and energy and chemicals production. Biotech companies also are becoming more global, increasing their presence and relationships outside the U.S. This report shows biotechnology companies are a major driving force behind the new economy of the 21st century.

Findings in *Focus on Fundamentals* reveal the number of U.S. biotech companies has increased significantly from 1999 to 2000. Employment has grown. Revenues have surged. Drug approvals have increased.

Through its guest contributors and Ernst & Young analysis, however, *Focus on Fundamentals* also sounds cautionary notes. Revolutionary breakthroughs based on recent advances in genomics will take time and require improvements in technology.

Biotech companies' scientific and financing successes have thrust them into the limelight where mistakes will be scrutinized more and tolerated less on Wall Street, in Washington, D.C., and on Main Street.

Last year's biotechnology report, *Convergence*, described how biotechnology and information technology were converging to decipher the data in the human genome. This technology convergence is even more critical as biotech companies shift their focus from genomics to proteomics. Understanding the function of proteins and how they interact in biological pathways will require enormous computing power.

Proteins are the fundamental molecules that guide all biological functions. That's why we selected a photograph of a protein crystal to illustrate the cover of this year's book. The protein is trypanathione reductase and was developed by scientists working with the National Aeronautics and Space Administration.

Recent advances in genomics and proteomics are responsible for a major secondary theme of this year's book: the emergence of personalized medicine and its impact on the health care system.

In the pages of *Focus on Fundamentals* you will find:

- Guest articles from leaders in the biotechnology and pharmaceutical industries.
- Comprehensive financial data on biotechnology companies.
- Comparisons of biotech performance with other sectors.
- Reviews of stock market performance, equity financings, and product development.
- Discussions by experts on trends in the public and venture capital markets.
- Analysis of many business, public policy, and bioethical issues.
- Insight on the globalization of biotechnology companies.

This report will provide you with a guide for understanding the progress being made by biotechnology on many fronts and how that progress is reshaping our world. Join us also on our Web site at [www.ey.com/industry/health](http://www.ey.com/industry/health) and interact with our collection of health and life science knowledge.



Donn Szaro  
Ernst & Young Global and Americas  
Health Sciences Industry Director

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# Defining Events:

## July 2000 to June 2001

### Financing

#### Event

U.S. biotech companies raise \$33 billion on Wall Street in 2000, more than in the previous five years combined. More than 50% of publicly traded companies have at least three years' worth of cash on hand.

Financing window begins closing in late 2000; about \$2 billion raised on Wall Street during first quarter of 2001 compared with a quarterly average of \$8 billion in 2000. AMEX Biotech Index plummets 50% from October 2000 to April 2001, but sector rallies in late April and index jumps 75% by June 1.

Venture capital funding of biotech companies increases dramatically in 2000, but initial public offering (IPO) window shuts tightly in 2001 as only three companies go public in first quarter.

During a historic surge in stock prices in late 1999 and early 2000 followed by the current record slump, AMEX Biotech Index dramatically outperforms Nasdaq composite and Dow Jones Industrial Average indexes from July 1999 to June 1, 2001.

#### Implication

Biotech enters 2001 in strongest financial shape in its 25-year history. Companies face challenge of putting R&D funding to work efficiently while meeting product development expectations of investors.

Biotech in good position to bridge current down cycle. Companies focus on fundamentals of business to move products through development and maintain shareholder value.

Private companies and cash-poor publicly traded firms consider acquisition as an alternative exit strategy.

Biotech becomes key focus of the new economy and is recognized for a broad technology platform of innovation across many industry sectors, including health care, agriculture, manufacturing, energy, and environmental management.

### Product Development

#### Event

Human genome map is published on Internet, in February 2001, and scientists who performed mapping reveal genome contains about 40,000—not 100,000—genes.

More than half of biotech drugs approved in 2000 were codeveloped or are marketed by pharmaceutical companies.

U.S. Food and Drug Administration approves first cancer drug created by rational drug design and first monoclonal antibody—ferried chemotherapy.

Biotech revenues of publicly traded companies in 2000 increase 17% over 1999; 60 companies report profits for the year.

#### Implication

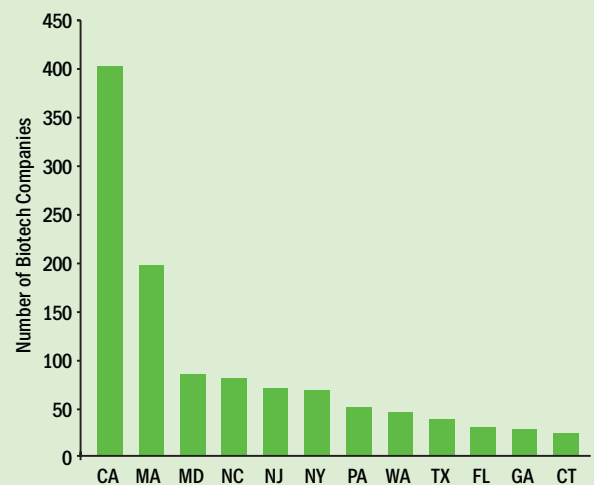
Research focus shifts to proteomics, and genetic variation emerges as key element of drug development. Anyone with access to the Internet can add value to understanding of human biology.

Pharmaceutical company alliances remain major driver in success of biotech health care sector.

Biotechnology sets the stage for major therapeutic breakthroughs from genomics advances.

Biotech matures. Product revenue performance, in addition to R&D success, becomes critical driver of sector's value for investors.

Exhibit 1: Top 12 Biotech States



Source: Ernst & Young

## Strategic Alliances/M&As

Event	Implication
Number of biotech alliances decreases, but value of deals soars.	New financial strength reduces need to partner drug candidates in early development and puts biotech companies in better bargaining position with pharmaceutical companies.
CuraGen's \$1.5 billion deal with Bayer could be the most valuable drug discovery and development alliance ever for a biotech company.	Biotech companies move closer to being an equal partner with pharmaceutical companies in drug discovery and development.
Fewer pharmaceutical company acquisitions of biotech companies, but biotech-biotech merger and acquisition (M&A) activity remains strong.	Financially strong biotech companies revive visions of being fully integrated drug companies. Merger strategy geared toward acquiring critical mass for achieving drug development independence.

## Public Policy

Event	Implication
Republican George W. Bush becomes President, ending eight years of Democratic control of White House. Republican Party also takes control of Senate and House of Representatives, then loses Senate as Republican Jim Jeffords of Vermont switches to independent status.	Medicare reform remains the main issue for biotechnology. Prospect for private sector solution moderately increases, and pressure for immediate drug price controls is temporarily lessened.
U.S. Patent and Trademark Office (PTO) issues new guidelines for gene-based patents. Amgen wins patent infringement court case against Transkaryotic Therapies.	PTO guidelines head off legislative action, but intellectual property landscape still unsettled. Courts have major role to play in establishing scope of gene-based patents.
National Institutes of Health moves to fund research on human embryonic stem cells despite opposition from religious groups. But President Bush limits funding to 60 cell lines and favors ban on cloning human embryos for stem cell research.	Stem cell research represents U.S. government's first major challenge of the 21st century in balancing strong bioethics concerns against the promise of dramatic therapeutic advances.
Private groups announce plans to clone humans despite opposition from industry, government, academia, and patient groups.	Move may cause backlash against other research efforts and could slow progress on therapeutic breakthroughs.

### Exhibit 2: Biotech at a Glance (\$ in Billions)

	Public Companies			Industry Total		
	2000	Percent Change	1999	2000	Percent Change	1999
<b>Financial</b>						
Product Sales	\$15.9	16.8%	\$13.6	\$18.1	12.6%	\$16.1
Revenues	22.0	16.8	18.8	25.0	12.2	22.3
R&D Expense	9.9	43.6	6.9	13.8	29.2	10.7
Net Loss	3.9	22.9	3.2	5.8	2.7	5.6
<b>Industry</b>						
Market Capitalization	\$330.8	-6.4%	\$353.5	NA	NA	NA
Total Financings*	\$29.9	308.4	\$7.3	\$32.7	272.2	\$8.8
Number of IPOs	56	409.1	11	56	409.1	11
Number of Companies**	339	12.6	301	1,379	8.2	1,274
Employees	128,000	12.3	114,000	174,000	7.4	162,000

Source: Ernst & Young analysis of company financial statement data  
Financial data based on December 31 financial statements.

Number of companies and employees calculated as of December 31 of each year. Market capitalization for 2000 and 1999 from June 29, 2001, and June 30, 2000, respectively.

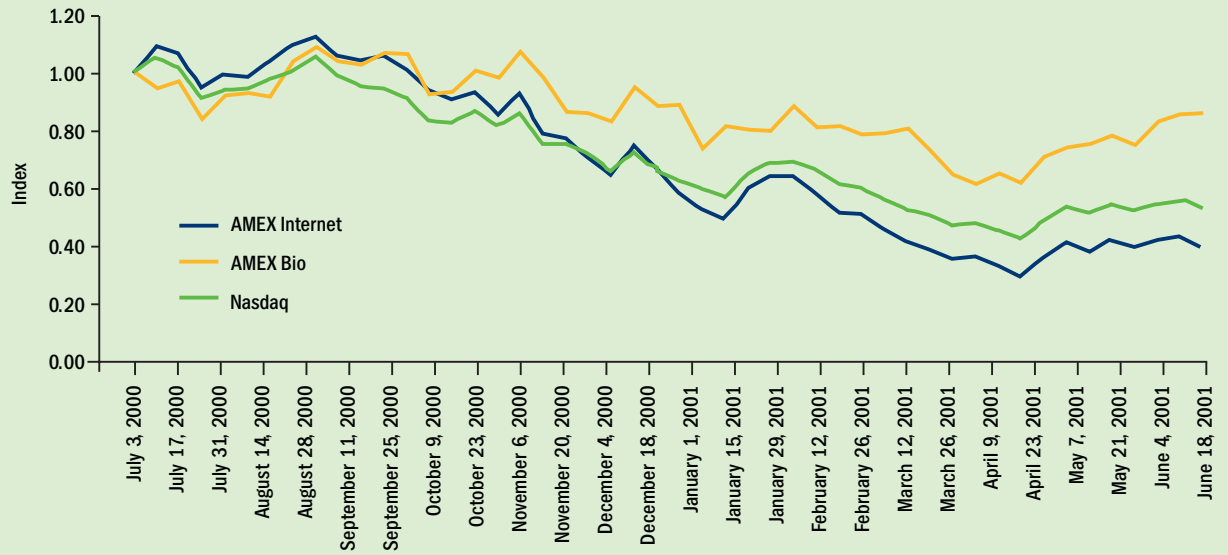
Some numbers may appear inconsistent because of rounding.

NA: Not Applicable

\*Total Financings: "Public Companies" includes capital raised by public companies through IPOs, follow-on offerings, convertible stock, debt offerings, etc. "Industry Total" adds venture financings to "Public Companies" financings.

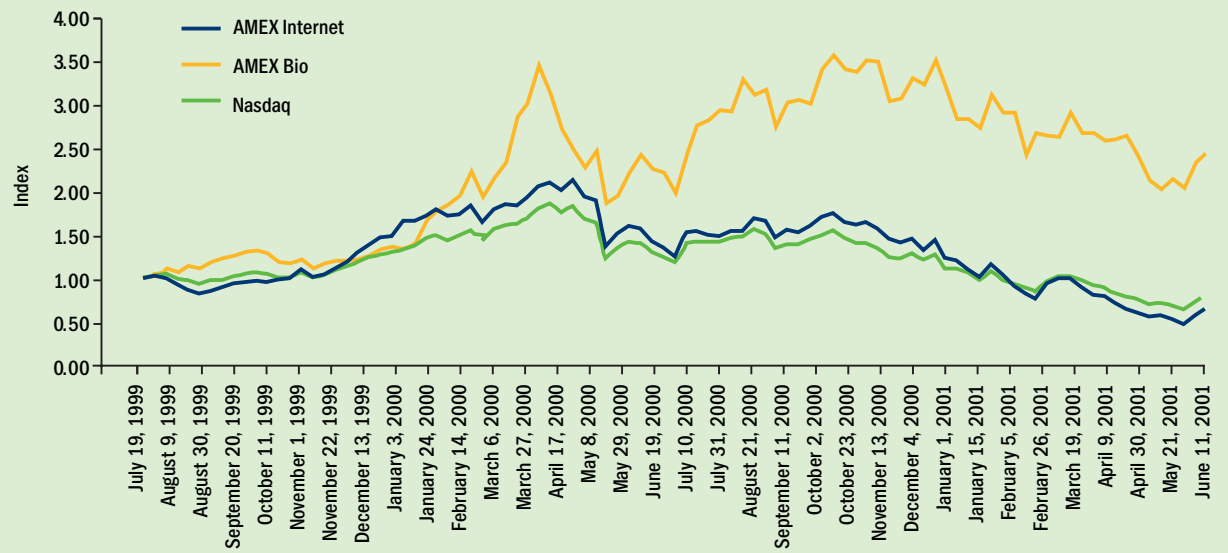
\*\*\*Number of Companies" includes adjustments for M&A activity and bankruptcies and thus may appear inconsistent with IPO activity.

**Exhibit 3: Biotech v. Internet Stocks (July 2000–June 2001)**



Sources: www.yahoo.com, Ernst & Young

**Exhibit 4: Biotech v. Internet Stocks (July 1999–June 2001)**



Source: www.yahoo.com

**Between July 1, 1999, and June 29, 2001, the AMEX Biotech Index was up 177%, while the AMEX Internet Index was down 39%.**

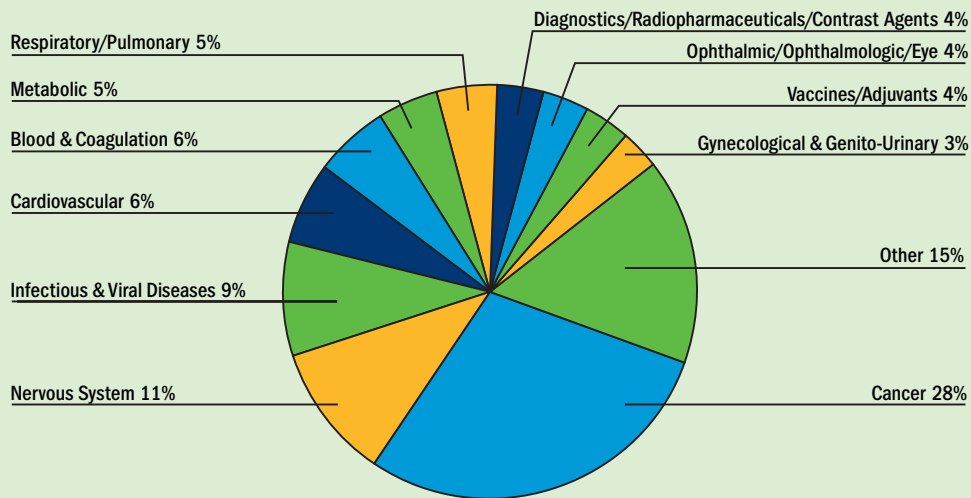
**Exhibit 10: Ernst & Young Survival Index**

	2000		1999		1998		1997	
	Number of Companies	Percent of Total	Number of Companies	Percent of Total	Number of Companies	Percent of Total	Number of Companies	Percent of Total
More than 5 year's cash	143	42.2%	76	25.2%	75	23.7%	101	30.9%
3-5 year's cash	40	11.8	29	9.6	23	7.3	30	9.2
2-3 year's cash	27	8.0	30	10.0	38	12.0	46	14.1
1-2 year's cash	57	16.8	59	19.6	76	24.0	68	20.8
Less than 1 year cash	72	21.2	107	35.5	105	33.1	82	25.1
<b>Total Public Companies</b>	<b>339</b>		<b>301</b>		<b>317</b>		<b>327</b>	

Sources: Company financial statements, Ernst & Young

Survival Index indicates the number of years of cash that companies have on hand based on current spending levels. Estimates are based on fiscal year-end numbers. Some numbers appear inconsistent because of rounding.

**Exhibit 11: The Biotech Pipeline: Phase III Trials**



Sources: NDA Pipeline, Ernst & Young

**Exhibit 12: The Merck/Biotech Index—A Comparison (\$ in Billions)**

	2000	Merck		2000	Biotech Industry	
		1999	Percent Change		1999	Percent Change
Total Revenue	\$40.4	\$32.8	23.1%	\$25.0	\$22.3	12.2%
R&D Expense	2.3	2.1	11.6	13.8	10.7	29.2
Net Income (Loss)	6.8	5.9	15.6	(5.8)	(5.6)	(2.7)
Market Capitalization	146.5	176.3	-16.9	330.8	353.5	-6.4
Employees	69,300	62,300	11.2	174,000	162,000	7.4

Sources: Company financial statements, Ernst & Young

Some numbers may appear inconsistent because of rounding. Market capitalization as of June 29, 2001, and June 30, 2000.

Biotech market capitalization is for publicly traded companies.

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