

A Brave New World:
From Bio to Pharma in the New Millennium
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Philadelphia, PA

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Knowledge
Logic
Information
Opportunity
Strategy

Agenda

- Not your grandmother's industry!
- Review: Drug Development
- Drug Development Economics
- How will we get **there**?
- Bio/Pharma Developments
- The Shape of Things to Come
- Conclusions
- Q & A

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...not your grandmother's industry, anymore!!!

- Life Sciences =
 - ✓ Biotech
 - ✓ Pharma
 - ✓ Medical/Health Software
 - ✓ Medical Devices & Diagnostics
- Operating at the Frontiers of Science
- Operating with a *frontier mentality*
 - ✓ It's the Wild West, out there!

Drug Development

Pre-Clinical	IND	Phase I	Phase II Trials	Phase III Trials	NDA	Post NDA
<ul style="list-style-type: none"> • Synthesis & Development • \$205M avg. • 18mos–4yrs 	<ul style="list-style-type: none"> • IND Appl. filed 	<ul style="list-style-type: none"> • Safety Trials • 6-18mos 	<ul style="list-style-type: none"> • Safety & Efficacy • 24mos 	<ul style="list-style-type: none"> • Controlled Safety & Efficacy • 1 – 4yrs 	<ul style="list-style-type: none"> • NDA filed • 2yrs 	<ul style="list-style-type: none"> • Mktg Studies

Drug Development Economics

- Synthesis:Approval = 10,000:1
- Commercialization
 - ✓ Pre-clinical + Clinical Costs > \$300 million
 - ✓ = 5-12 years
 - ✓ Big Pharma = 0.5 drugs/co. annually
 - ✓ Shrinking pipeline

Drug Development Economics

- Big Pharma
 - ✓ Revenues/company (avg.): \$10 billion
 - ✓ Growth: 10%/year (> \$1B/year)
 - ✓ 0.5 drug/co. annually = internal production

Drug Development Economics

- To maintain revenue growth at 10%/year:
 - ✓ 3 to 4 new drugs/co. annually
 - ✓ Revenue = \$300-\$400 million/drug
- At present, half the new drugs introduced each year have market value < \$100M...

How will we get there???



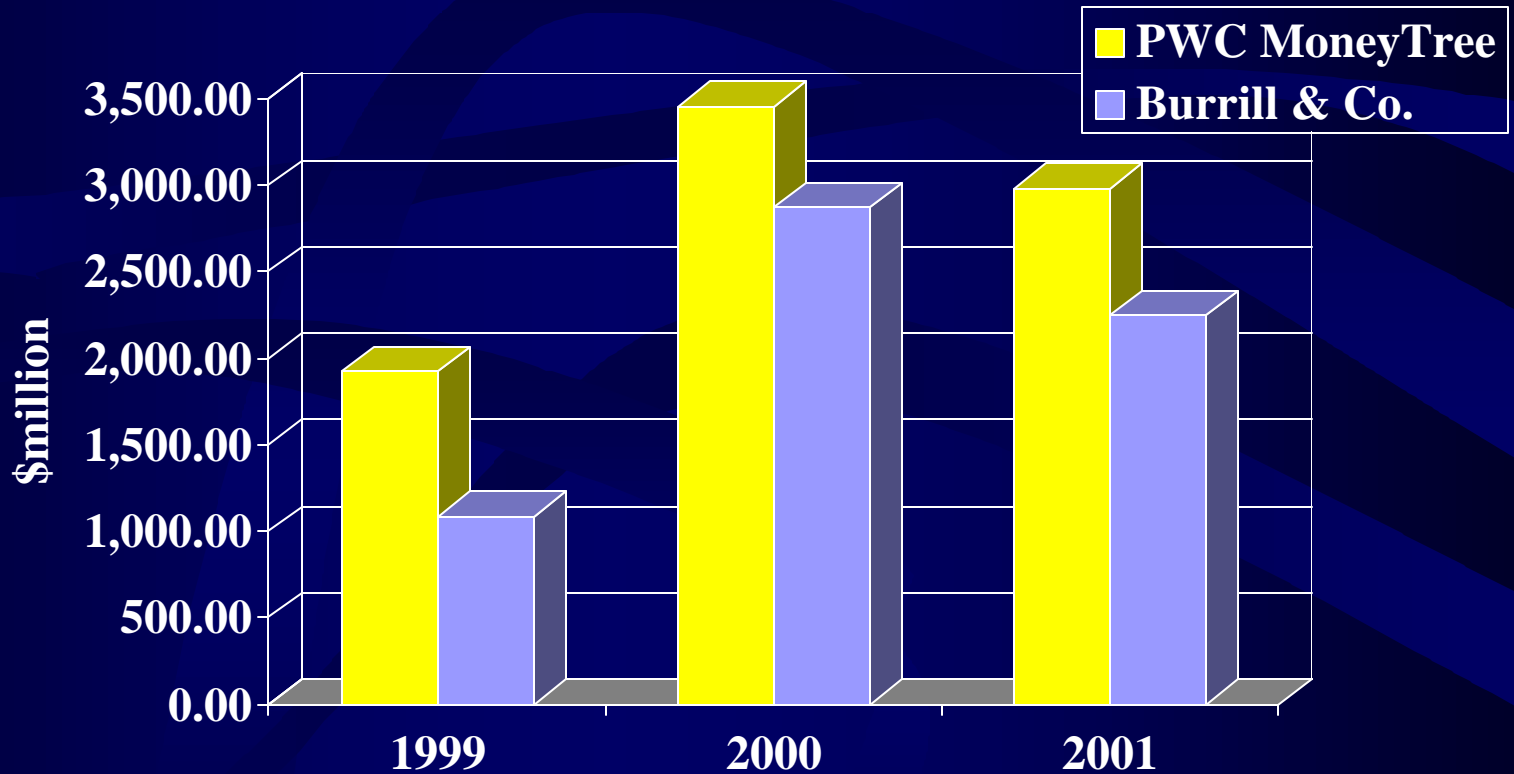
US Biotech Fundraising, '98-'01

(\$ million)

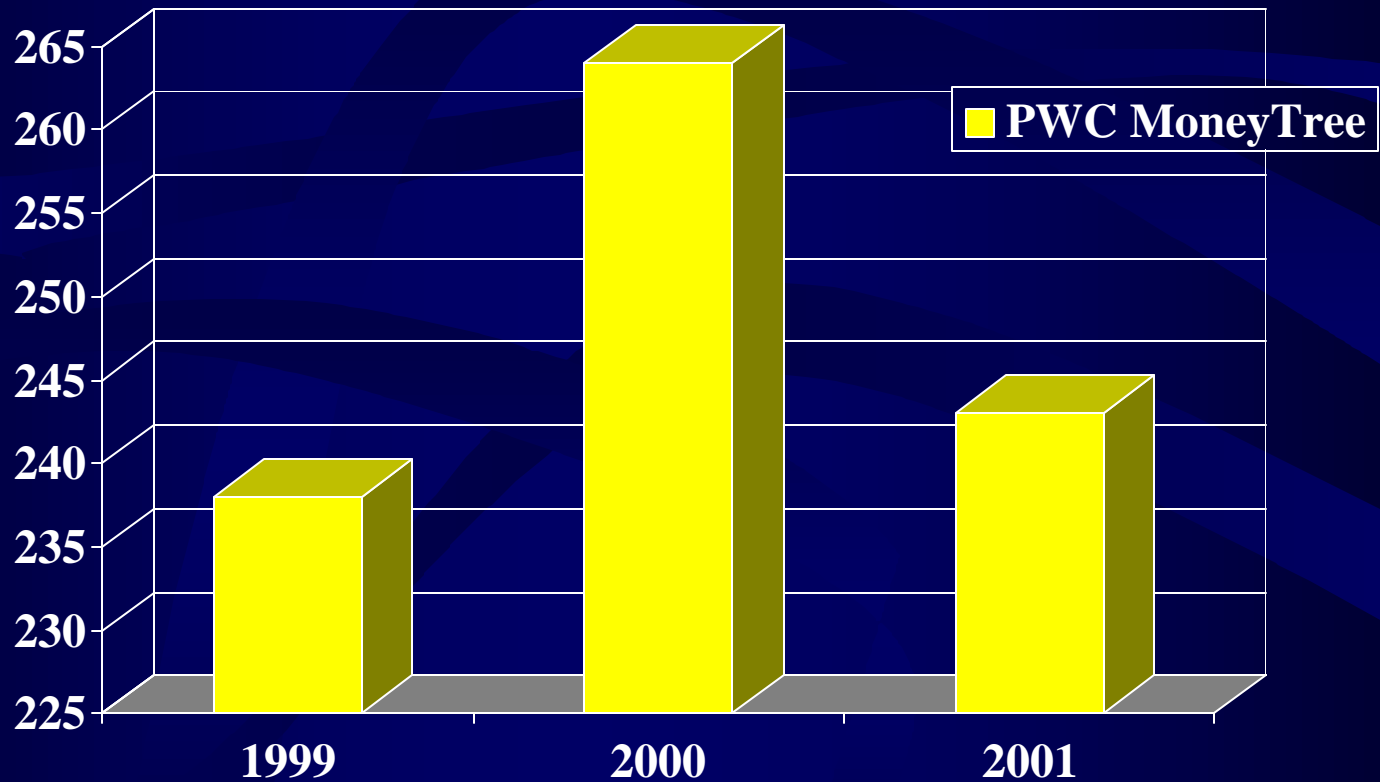
Source: Burrill & Company

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Public	3,129	9,428	28,930	8,646
IPO	369	670	6,490	440
Follow-on	521	5,805	12,651	2,240
Debt	1,262	1,520	5,728	4,091
Private	884	1,268	3,075	2,409
<u>VC</u>	<u>800</u>	<u>1,084</u>	<u>2,872</u>	<u>2,245</u>
Total	4,013	10,696	32,005	11,055

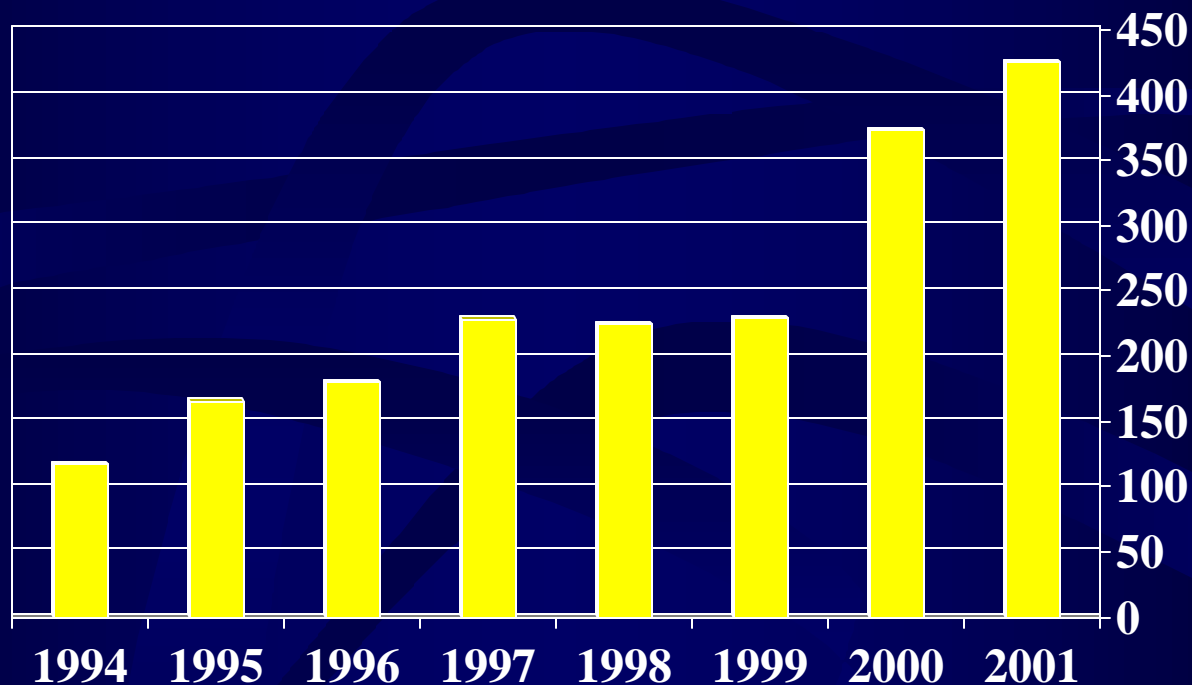
Biotech Venture Deals, '99-'01



Biotech Venture Deals, '99-'01 (#deals)



Bio-Pharma Collaborations, '94-'01



Source: Burrill & Co., BioWorld Financial Watch, American Health Consultants, Bio Century

The Shape of Things to Come

- Human genome sequence is complete
- Integration of “wet” & “digital” biology
- Life science restructuring continues
 - ✓ Remember “platform” technology?
 - ✓ Partnering, mergers, spin-outs,...
 - ✓ Whither agribiotech?
- Government influence
 - ✓ Terrorism
 - ✓ Regulation
 - ✓ Economics, Globalization

The Shape of Things to Come

- Operating at the Frontiers
 - ✓ Science
 - ✓ “Wild West”
- Observation: Opportunities arise along the development continuum
 - ✓ Process-orientation
 - Genomics
 - Functional Genomics
 - Proteomics
 - High Throughput Screening
 - Drug Development
 - Big Pharma
 - Big Bio
 - Bioinformatics, Instrumentation, Diagnostics, etc.

The Shape of Things to Come

- 26 years since Genentech
- 2001—The year of *Big Biotech*:
 - ✓ Select Biotech M&A Activity, 2001
 - Amgen acquires Immunex / Price: \$16 billion
 - Millennium Pharma buys COR Therapeutics / Price: \$2.4 billion
 - MedImmune buys Aviron / Price: \$1.5 billion

The Shape of Things to Come

- Why pharmaceutical companies look toward biotech companies:
 - ✓ Slow pipeline volume
 - ✓ R&D pace/cost
 - ✓ Length of regulatory approval process

The Shape of Things to Come

- Why biotech companies look toward other biotech companies:
 - ✓ New products
 - Revenue!
 - ✓ Complementary technologies
 - ✓ Distribution mechanism
 - Sales & marketing capabilities

Conclusions

- “The drug is still the prize.”

-G. Steven Burrill
CEO, Burrill & Company

- “...if you have one product, that’s not going to be enough and you have to find more. You need to either be the finder or the found.”

-Karen Bernstein
Editor-in-chief, BioCentury

Q & A

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