

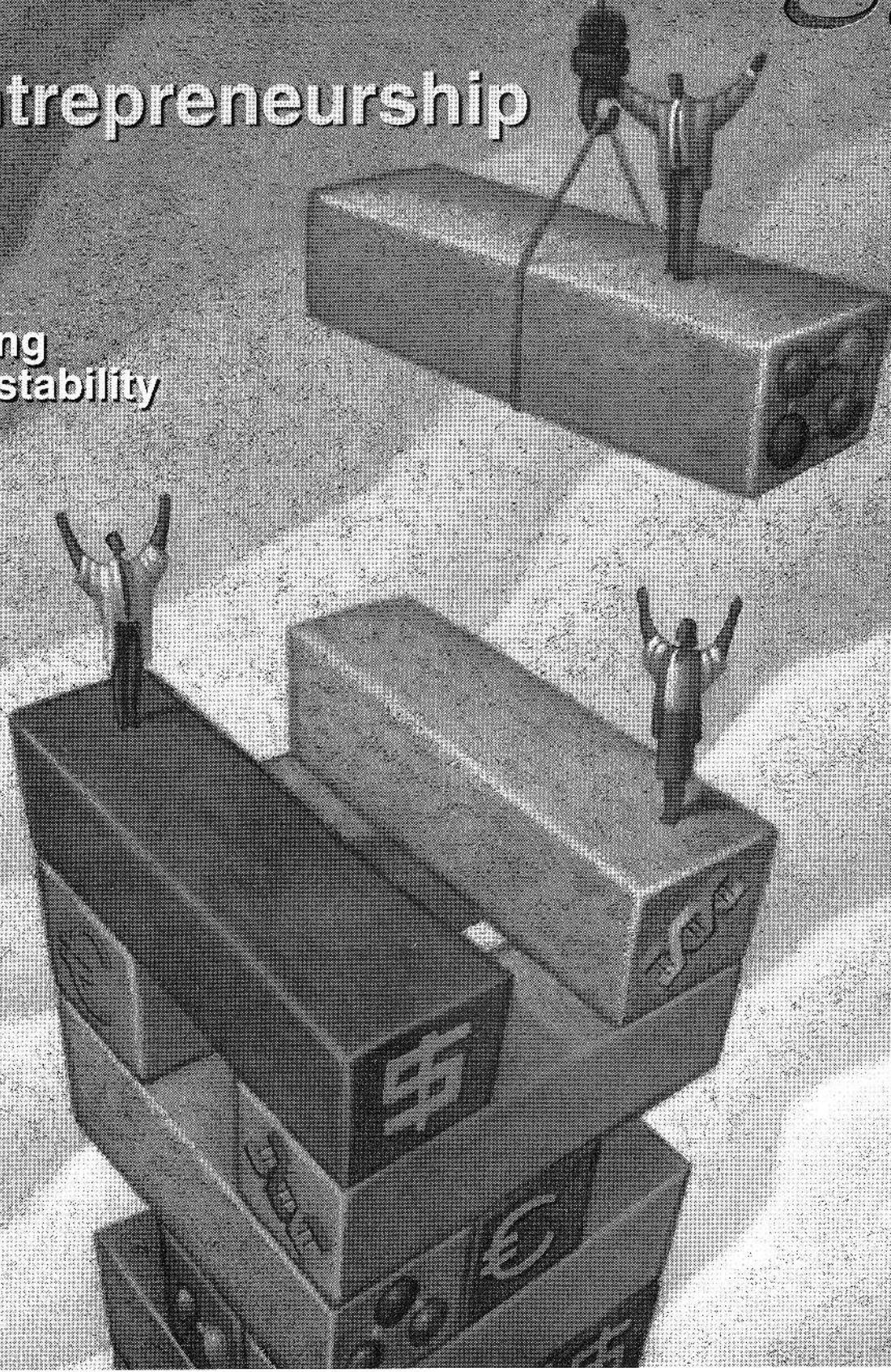
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A rationale for consolidation among biotechnology micro-caps

There are many reasons for consolidation of micro-cap companies, but the most important is the creation of mid-caps large enough to get stock prices moving again.

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Micro-cap biotechnology companies, those with market valuations less than \$200 million—are in a financial crunch of major proportions. Investor and analyst interest is low, and as a result, companies do not have the cash they need to survive, let alone thrive. Even though biotechnology stocks have had funding droughts before, what is different this time is that we do not believe the current lack of investments in micro-cap biotechnology stocks will change. To flourish in the next millennium, we feel that the companies themselves will need to change—both their mindsets and strategies.

Too many companies chasing too few investment dollars

As Figure 1 demonstrates, some 232 public companies—approximately 79% of the US biotechnology industry—are valued individually at less than \$200 million. However, with the dramatic consolidation in the banking and investment community creating megafunds and huge institutional portfolios, much of the market does not even want to look at companies with valuations under \$750 million. Using this yardstick, only 5% of the publicly traded biotechnology industry—a mere 16 companies—represent securities that most institutional investors and Wall Street analysts would find acceptable. The situation is getting worse, as the number of public biotechnology companies with less than \$200 million in market value has grown over the last year.

Another interesting feature of the current financial landscape is that 1998 was the first year in the history of the biotechnology industry (dating back to the initial public

offering of Genentech) when M & A transactions exceeded IPOs in the US. For the most part, these transactions focused on companies with less than \$200 million in market capitalization. We believe this activity is merely the beginning, and that as more companies recognize and accept the harsh realities of the current financial environment, strategic consolidations will be the method of choice for managements looking to create critical mass and added investor value.

Why investors have lost interest

Because institutional investors managing ever-larger funds must seek out larger investment opportunities, an atmosphere fostering consolidation has been created. The aversion to investing in smaller-cap companies is heightened by their lack of liquidity. In a classic "Catch 22" situation, the severe lack of trading liquidity among micro-cap biotechnology companies makes them particularly unattractive to institutional investors, who must be able to get in and out of companies at will. The lack of trading liquidity is then compounded by the lack of investment, creating a downward spiral.

The lack of trading liquidity also makes it difficult for small biotech companies to withstand the bad news that is often a part of the complex and risky process of drug development and approval. An obstacle at the US Food and Drug Administration, a phase III trial that does not go

as planned, or any unexpected delay in a drug's launch date, or a shortfall in expected product sales can have a major negative impact on the price of a company's stock. This effect is long lasting for micro-cap companies, especially those seen as single product enterprises. Table 1 shows that the penalty in valuation is severe when a product fails or when clinical data disappoints Wall Street. Indeed, many companies have lost up to 77% of their market value following product failures or clinical trial delays. Without adequate cash reserves to weather such storms, small companies are doomed to fail, and with the trading liquidity shortage, investors can often lose half of their money before an escape from investments in these companies is possible.

As a result, the risk/reward profile for investors in micro-cap biotech companies is very unfavorable. For every Amgen, there are hundreds of companies that will never make a profit. Even if they eventually do become

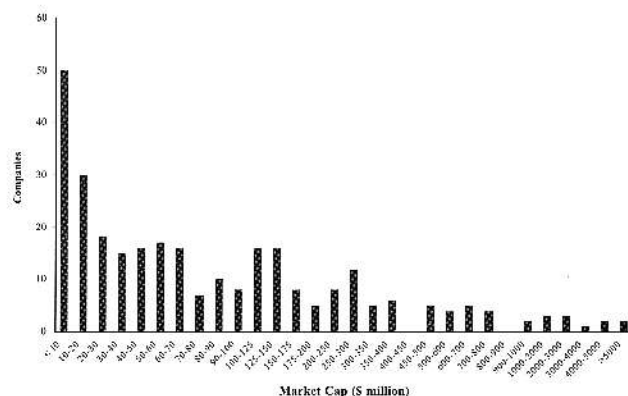


Figure 1. Market-cap analysis of the US biotech industry on December 11, 1998.

Table 1. Impact on stock price by product failures or clinical trial delays.

Category	1 day change	30 days out	6 months out	30-day low	6-month low
All companies	-45%	-45%	-47%	-55%	-66%
Events since Q1 '98	-48%	-49%	-60%	-58%	-74%
Events since Q2 '98	-49%	-52%	-57%	-60%	-72%
Events since Q3 '98	-65%	-64%	-66%	-76%	-77%
All one-product companies	-56%	-56%	-67%	-68%	-77%

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profitable, the investment return from a successful micro-cap company, even in the best of cases, may not be sufficient to make a significant difference in the investment returns of a portfolio manager presiding over the typical multi-billion dollar healthcare fund.

Consider this example: Manager A runs a \$2 billion healthcare fund and buys 10% of a micro-cap biotechnology company with a \$50 million market valuation. The stock turns out to be a real winner and increases in value tenfold to \$500 million over the next three to five years. But even this \$45 million pre-tax profit—admittedly unusual in a biotechnology investment—only represents 2.25% of the portfolio manager's entire healthcare fund. The odds, as well as the ultimate investment returns themselves, argue against the wisdom of an institutional investor spending the time required to pick out the tenfold winner from the ever-growing field of micro-cap companies.

Does this mean that healthcare funds and other mutual funds are against biotechnology investments? Not at all. These funds continue to invest significant dollars in the sector, but primarily in larger-cap companies. Approximately \$20 billion is currently invested in healthcare-specific funds, yet only \$700 million—some 3.5%—is invested in biotech companies with valuations below \$100 million.

On average, managers of healthcare funds have invested just \$1–3 million in biotechnology companies with valuations between \$50–100 million, but they have invested an average of between \$27–75 million in companies with market caps over \$1 billion. Viewed another way, micro-caps have approximately 15% institutional ownership, while those with valuations over \$1 billion have 45–60% of their equity held by institutions (see Figure 2).

No matter how the percentages are viewed, the wisdom of investing in large-cap biotechnology companies is clear, as shown in Figure 3. Large-cap companies have performed better than the NASDAQ Composite Index over the past year, while the smaller-cap companies have been significant underperformers.

Part of the problem

While liquidity, product failures, and a high risk/reward ratio are all major contributors to the current lack of interest in micro-cap biotechnology companies, no single issue seems as critical to us as the ongoing consolidation of investment houses that has decimated the ranks of sell-side analysts. Because of the complexity of the underlying technology and inherent risk in the drug development and approval process, few portfolio managers will invest in a biotechnology company without some outside confirmation that the products being developed are technically, med-

ically, and financially sound. They need to hear about sustainable product sales, growing gross margins, and incremental pre-tax income in a framework with which they are familiar. Historically, this information has come from two sources: the sell-side analyst, and the buy-side analyst or portfolio manager trained in the complexities of drug development, approval, and commercialization. These investment professionals have become true rarities, and are a continually shrinking resource.

To best understand the complex story behind most biotechnology companies, there should be analyst coverage. Analysts also serve the function of news amplifier, expanding a single message from a company to about 30 institutional salespeople, who then contact perhaps 20 portfolio managers, bringing up to 600 "hits" per news-bite.

Unfortunately, the number of analysts covering the biotech industry has fallen dramatically over the last several years. During that time, 27 major banks have become ten much larger institutions, resulting in the halving of the number of analysts devoted to the US biotech industry. As economic sense would dictate, most of the remaining analysts cover the larger, more liquid biotechnology companies in which trading by their firm makes the most financial sense. Further, banks are not inclined to hire new analysts because of low trading volumes in biotechnology, and many of the analysts who remain have been burned in the past by stock crashes, making them more risk-averse than ever before.

Another way to measure the impact of the change in analyst coverage is as follows: The average sell-side analyst covers 18 companies. The top 25 market-cap companies in biotechnology fill approximately 60% of the 470 coverage slots, with another 25% being filled by companies between \$200 and \$450 million in valuation. The result is that there are approximately 241 publicly traded biotech companies vying for the remaining 75 total coverage slots. The unfortunate out-

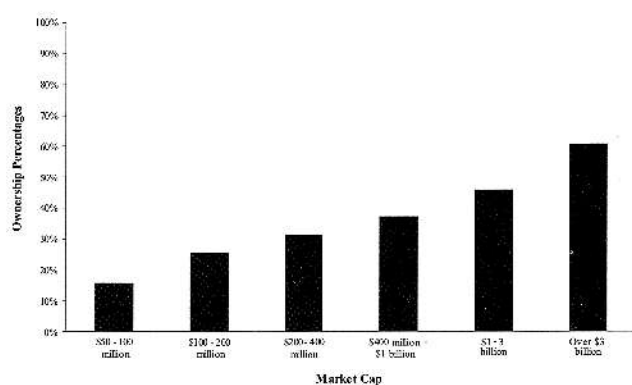


Figure 2. Institutional ownership of biotechnology stocks.

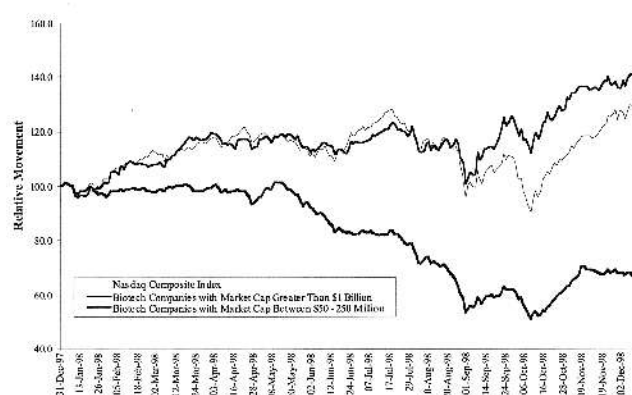


Figure 3. The performance split between large-cap and small-cap biotechnology companies over the past year.

come? The micro-cap biotechnology companies that form 83% of the industry are without significant analyst coverage. And without coverage, it is difficult, if not impossible, to attract institutional investment.

The only solution

All of the indications tell us that micro-cap biotechnology companies cannot continue to survive on their own in this kind of investment environment. No matter how exciting the science or how promising the market, we do not believe that they will be able to attract the necessary investment to be successful.

By strategically combining several well-matched micro-cap companies, or having these companies acquired by larger, more successful biotechnology firms, stronger, more vital companies can be created, with larger market caps to satisfy the larger investment appetites of institutional investors. These new companies will also have the ability to more efficiently allocate often scarce financial resources. If done correctly, biotechnology consolidations should create enough visibility for the new company to attract greater analyst coverage, diversify risks, and realize the operational and financial efficiencies needed to achieve success. ///