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# ORGANIZATIONAL INTEGRATION OF ACQUIRED BIOTECHNOLOGY COMPANIES INTO PHARMACEUTICAL COMPANIES: THE NEED FOR A HYBRID APPROACH

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**This analysis of the postacquisition integration of biotechnology companies by pharmaceutical companies addresses new issues in the pharmaceutical and biotechnology industries and includes five in-depth case studies. The guiding research question is how a biotech company is integrated into a pharmaceutical company seeking access to the biotech company's know-how, technologies, and innovative capabilities. I conclude that given the complexity and multifaceted nature of mergers and acquisitions, pharmaceutical companies need to apply a hybrid postacquisition integration approach with simultaneous short- and long-term motives/orientations and segmentation at a different pace across different value chain components.**

Mergers and acquisitions (M&As) are among the most dramatic and visible manifestations of strategy at the corporate level. Acquirers can gain immediate access to technologies, products, distribution channels, and desirable market positions. Acquisitions can bring into a company capabilities it finds hard to develop and can provide the opportunity to leverage existing capabilities. The 1980s and the 1990s were both characterized by waves of M&As that transformed industries and affected the careers of millions (Auster & Sirower, 2002; Golbe & White, 1993). However, many M&As have not been successful and have failed to achieve their objectives owing to questionable acquisition motives, problems regarding valuation and premiums paid, and difficulties in the postacquisition integration process (Agrawal & Jaffe, 2000; Datta, Pinches, & Narayanan, 1992; Sirower, 1997), suggesting that they are generally not well understood in practice (Jemison & Sitkin, 1986; Hitt, Hoskisson, Ireland, & Harrison, 1991).

Various motives have driven M&As (Bower, 2001; Ravenscraft & Scherer, 1987). Over time, managerial motivations for acquisitions have included horizontal and vertical integration, market power gains, geographic expansion, efficiency gains, empire building, resource sharing, and diversification (Steiner, 1975; Trautwein, 1990). Moreover, the desire to obtain valuable resources, including know-how, technologies, and capabilities possessed by target firms, has been a driver of M&A activities (Ahuja & Katila, 2001; Chaudhuri & Tabrizi, 1999). It seems that this last motive has increased in importance in the most recent wave of acquisition activity (Bower, 2001), especially as the number of acquisitions during the 1990s rose dramatically in high-technology sectors such as telecommunications and biotechnology (Goldman Sachs, 2001; Inkpen, Sundaram, & Rockwood, 2000).

M&A activities have been studied by academics from several disciplines and through various theoretical lenses. Despite this broad body of literature and the existence of some efforts to bridge the gap between existing research streams (Haspeslagh & Jemison, 1991; Larsson, 1990), there is still a lot of fragmentation in M&A research (Larsson & Finkelstein, 1999). First, authors in the field of strategic management have been primarily concerned with the performance effects of different types of M&As (Lubatkin, 1983; Seth, 1990). Second, research in economics has focused on M&A motives and performance (Goldberg, 1983; Steiner, 1975). Third, the field of finance has addressed the question of whether M&As do create value (Jensen & Ruback, 1983; Lubatkin, 1987). Fourth, the human resources management literature on M&A (Ivancevich, Schweiger, & Power, 1987) has stressed psychological issues (Marks & Mirvis, 1986), the importance of effective communication (Schweiger & DeNisi, 1991), and M&As' effects on careers and turnover (Hambrick & Canella, 1993). Fifth, organizational research has dealt with postcombination integration (Birkinshaw, Bresman, & Hakanson,

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2000; Haspeslagh & Jemison, 1991; Shrivastava, 1986), highlighting the problem of bringing together different organizational cultures (Cartwright & Cooper, 1992; Larsson & Lubatkin, 2001).

Research on the postacquisition integration process builds on the premises that value creation takes place after acquisitions (Haspeslagh & Jemison, 1991) and that integration design has an important influence on the ultimate success or failure of an acquisition (Pablo, 1994). Despite the growing number of studies analyzing the different challenges of postacquisition integration, such as speed (Kitching, 1967; Schweiger & Walsh, 1990), organizational fit (Chatterjee, Lubatkin, Schweiger, & Weber, 1992; Datta, 1991), and top employee turnover during the acquisition transition (Walsh, 1988, 1989), the issue of postacquisition integration is still viewed as lacking sufficient rigorous empirical research (Bower, 2001; Inkpen et al., 2000; Javidan, Pablo, Singh, Hitt, & Jemison, 2004; Larsson & Finkelstein, 1999). That many if not most M&As do not succeed (Sirower, 1997) can be seen as indicating the absence of adequate empirical research, which in turn may lead to the conclusion that existing integration approaches and typologies (Buono & Bowditch, 1989; Haspeslagh & Jemison, 1991; Marks & Mirvis, 1998; Nahavandi & Malekzadeh, 1988; Napier, 1989) fail to address the complexity of the postacquisition integration process. Even though the collective results of these studies provide critical insight into postacquisition success factors, they tend to offer a "one-size-fits-all" solution—whereby one given kind of combination has only one kind of integration approach. However, in view of the high failure rate of M&As, there seems to be a clear need to go beyond single integration approaches. It may be necessary to combine different approaches in one integration process, depending on the motives, the industry sector and company characteristics, and the functions/stages of the "value chain" (categories of value-adding activities of an organization) to be integrated. Much of the research on M&As has addressed a variety of problems and dilemmas; however, researchers have failed to link these integration problems to the motives for acquisitions or to the types of resources being acquired (Ranft & Lord, 2002). Instead, existing research tends to lump all types of acquisitions together (Bower, 2001) and, in so doing, it tends toward overgeneralization and oversimplification when dealing with M&As. Thus, existing research provides only a limited and insufficient understanding of this multidimensional phenomenon (Pablo & Javidan, 2004). The reality is that in any given merger or acquisition, the combined firm will choose multiple levels or types of integration. As long as scholars limit themselves to categorizing integration approaches with single types or variables, the complex postacquisition processes cannot be fully captured. Given that M&As have multiple motives (Bower, 2001) and that the M&A process is very complex (Larsson, 1990), applying just one single integration approach when integrating an acquired company severely limits the understanding of this complexity.

This article, which is based on five in-depth case studies, analyzes the postacquisition integration of pharmaceutical and biotech companies and develops a postacquisition integration framework, calling for a hybrid postacquisition integration approach combining simultaneous short- and long-term motives with segmentation across different functions and value chain components. This study was motivated by Bower's (2001) argument that all M&A strategies are not alike and that knowledge and understanding of the (strategic) motives underlying them is important to successfully implementing different types of acquisitions (Shrivastava, 1986). The research question for this study was how a biotech company is integrated into a pharmaceutical company seeking to gain access to know-how, technologies, and innovative capabilities incorporated in the biotech company.

The pharmaceutical and biotechnology industry is an important context for examining organizational integration activities. In industries characterized by rapid innovation, technological complexity, and highly specialized skills and know-how, the pace and magnitude of technological change may not allow firms to internally develop all the technologies and capabilities they need to remain competitive. The next section provides information on the relevant issues in the pharmaceutical and biotech industries and relates these issues to the M&A literature. This is followed by a description of the methodology used in the present study and a presentation of the cases and propositions. I then present the new framework and conclude by specifying limitations and presenting implications for future research.

## NEW ISSUES IN THE PHARMACEUTICAL AND BIOTECHNOLOGY INDUSTRIES

Three factors have historically characterized competition in the pharmaceutical industry: First, "blockbusters"—drugs that sell so well that they offset the cost of expensive hit-or-miss clinical trial programs—have driven competitive advantage. Second, most pharmaceutical companies have been vertically integrated from research through sales. Third, pharmaceutical companies have played a

peripheral role as "suppliers" in the health care system, providing marketing solutions to payers and providers. In this environment, success has been based on a combination of serendipity and operational capabilities (Burrill & Company, 1998).

The scientific breakthroughs of biotechnology constituted a radical change from previously dominant technologies in the pharmaceutical industry, thus reducing the value of existing competencies (Abernathy & Clark, 1985; Schumpeter, 1934; Tushman & Anderson, 1986). Therefore, "biotechnology is a dramatic case of a competence-destroying innovation" (Powell & Brantley, 1992: 368). Technological change here has built on a scientific basis (immunology and molecular biology) that differs significantly from the knowledge base (organic chemistry and its clinical application) of the established pharmaceutical industry (Powell, 1993).

First, an essential change is related to the discovery of new drugs. Because the causes of certain diseases were more or less unknown, the natural and chemically derived compounds were screened for potential therapeutic impact. Nowadays, technologies like genomics, high-throughput screening, combinatorial chemistry, and bioinformatics are supposed to make R&D more reliable and stable (Burrill & Company, 1998).

Second, as far as clinical development is concerned, drugs were usually developed over entire suffering patient populations. This process had some important drawbacks: (1) "Pipeline productivity" suffered because if a drug proved toxic or was effective 50 percent or less of the time during clinical trials, the project was terminated. (2) Mass-market development reduced potential efficacy rates. (3) Many drugs were approved with known side effects for small but undefined percentages of approved users. (4) Early termination of pipeline products meant groups of patients who might have responded well to the new medicines could not obtain them. Pharmaceutical firms seek to use new biotechnologies to lower development costs, reduce required clinical trial bases, and decrease time to market (BCG, 1999).

Third, in the area of sales and marketing, accelerating progress in genetic understanding makes it possible to segment patients on the basis of genomic descriptors and to tailor therapy according to their specific needs (BCG, 1999). Nevertheless, sales and marketing are still core competencies of pharmaceutical companies that operate worldwide and are important (complementary) assets needed to bring a drug to market (Arora & Gambardella, 1990).

Small biotech firms require much financial support and regulatory savvy, while larger pharmaceutical companies desire access to the research prowess of these companies (Powell, 1996). The research skills necessary to create new products are found in biotech firms, whereas the cash needed for clinical trials and worldwide marketing is located in pharmaceutical companies. For these latter companies, acquiring and understanding biotech know-how are crucial for their future survival (Powell & Brantley, 1992). Basically, there are three strategies (Hagedoorn & Duysters, 2002): first, organic growth, whereby pharmaceutical companies build this know-how on their own; second, strategic alliances with biotech firms; and, third, M&A to integrate companies with know-how and capabilities.

Zucker and Darby (1997) analyzed the transformation of the technological identity of a major U.S. pharmaceutical company in the area of drug discovery. Their study showed that this company recognized the need to transform its technological identity into a more biological design model in order to remain competitive in the face of the biotechnological revolution. However, this recognition was not enough to capture all relevant know-how, as biotechnology is a competence-destroying technology (Tushman & Anderson, 1986) requiring fundamentally new skills and technological competence (Powell & Brantley, 1992).

Strategic alliances are a widely used means of gaining access to biotech know-how (Greis, Dibner, & Bean, 1995; Powell, Koput, & Smith-Doerr, 1996; Shan, Walker, & Kogut, 1994). Deeds and Hill (1996) showed that at low levels, strategic alliances are positively related to new product development. However, as a firm's number of alliances increases, the benefits begin to decrease, and at high levels the costs of an additional alliance outweigh the benefits. Because of this inverted, U-shaped relationship, pharmaceutical companies need to complement strategic alliances with acquisitions (Hitt, Hoskisson, & Ireland, 1990). Thus, M&A is a possible strategy for overcoming lack of biotechnology knowledge, reducing R&D costs, increasing the number of potential products in a pipeline, and closing an earnings gap (Ahuja & Katila, 2001; Ranft & Lord, 2002). Several contributions (Arora & Gambardella, 1990; Haspeslagh & Jemison, 1991; Hitt, Hoskisson, Johnson, & Moesel, 1996; Pisano, 1991) have pointed at the important role that M&As can play as an external source of innovation. Moreover, Hagedoorn and Duysters (2002) showed that companies prefer M&As over strategic alliances as external sources of innovation for their core businesses.

Major pharmaceutical companies have always had a big interest in biotech companies. Since the mid 1990s, when valuations of biotech companies

were inflated, these valuations have been adjusted downwards and large biotech acquisitions have multiplied (Sikora, 2000). Pharmaceutical companies have become aware of the opportunity to acquire biotech know-how and technologies at lower cost than before and at lower cost than they would incur with internal development. The total valuation of M&As involving biotech companies increased from $3.3 billion in 1997, to $8.9 billion in 1998, to $13.7 billion in 1999, and to $19.0 billion in 2000 (Goldman Sachs, 2001).

With mergers and acquisitions of pharmaceutical and biotech companies a growing phenomenon, the question arises as to what else makes them so particular and interesting to study. Internally, biotech firms have created their own entrepreneurial, creative, and risk-taking culture and are organized flexibly in overlapping, interdisciplinary project teams with low levels of hierarchy, open communication, and informal organizational structures, thus creating dynamic, lean, and effective organizations fostering innovation (Powell, 1996). Furthermore, employees often have significant ownership stakes in the firms, so that they have very strong incentives to quickly develop new technologies at the lowest costs. These unique organizational characteristics are a source of key strategic and inventive capabilities (Barney, 1986, 1991) as they form the foundation for innovative research results. By contrast, pharmaceutical companies are characterized by formal structures, high levels of hierarchy, and long and slow decision-making processes. Overall, they do not have the same strong (ownership) incentives in place and are more risk-averse than biotech companies (Powell, 1996). With reference to Mintzberg (1979), biotech firms can be viewed as "adhocracies" and pharmaceutical companies as "bureaucracies."

Given these big differences in culture and organizational styles, merging such organizations is anything but easy (Buono & Bowditch, 1989; Cartwright & Cooper, 1993; Nahavandi & Malekzadeh, 1993; Weber, 1996). Interestingly, these studies have treated culture as a precondition to avoiding integration problems, whereas in this study I found it to also be part of organizational capabilities. Moreover, Bower pointed out that "many of the pharmaceuticals' R&D acquisitions have yet to pay off" (2001: 99–100). The reason for this is that biotech products and technologies are organic and far more difficult to integrate than computer or chip components, which benefit from the modularity of information technology (IT) design. The success of Cisco's acquisition of small high-tech firms (Goldblatt, 1999) and Microsoft's technology-driven acquisitions designed to keep up with the rise of the Internet (Rebello, 1997) are demonstrative.

Baldwin and Clark (2000), using the computer industry as an example, developed a theory of design and industrial evolution. This theory is based on the concept of modularity, whereby complex products are built from smaller subsystems that can be designed independently yet function as a whole. As most computers and chip designs are based on independent but compatible components (Langlois, 1992; Langlois & Robertson, 1992), it is relatively easy to buy technology or software that can be readily integrated because of existing interfaces that enable components to interact effectively without being made particular to a specific configuration (Schilling, 2000). Dell Computers, for example, outsources virtually all of its design and innovation for components, software, and nonassembly production and invests especially in component integration (Quinn, 2000). By contrast, biotech technologies and products are, as a result of their organic character, much more complex, as they cannot first be split up into different modules and then put together again.

In the field of biotechnology, the technological frontier is advanced with a knowledge, skill, and competence base fundamentally different from prior know-how (Powell, 1993). It is not enough for an acquirer to simply "buy" a technology, because, to create value, this technology must be nurtured and integrated throughout the postacquisition integration process (Larsson & Finkelstein, 1999). Thus, it is necessary to handle such a complex integration process carefully and to respect the local context of the acquired biotech company in order to make such an acquisition successful. Existing postacquisition integration approaches (Haspeslagh & Jemison, 1991; Nahavandi & Malezadeh, 1988; Napier, 1989) do not take into consideration that differences may exist in one integration process because of factors such as acquisition type, motive, or industry context.

Haspeslagh and Jemison (1991) distinguished three clear choices regarding postacquisition integration approaches. (1) *Preservation* reflects a need for low interdependence and high autonomy so that the acquired company is only integrated to a modest degree and preserves its way of doing business. (2) *Symbiotic acquisitions* reflect high interdependence and at the same time a high need for organizational autonomy. (3) In an *absorption acquisition,* the acquirer absorbs the acquired business directly and assimilates it into its culture. However, no clear choice is possible in many situations. Merger and acquisition is an inherently multilevel and multistage construct that cannot be

captured by single-level and single-stage approaches, which are too narrowly focused and will fail to capture the dynamism and complexity of the subject (Javidan et al., 2004), especially in the context of biotechnology (Bower, 2001).

The analytical focus of this article is on how acquiring pharmaceutical companies integrate acquired biotech companies to gain access to the know-how and technologies incorporated in the biotech company. However, pharmaceutical companies may have severe problems integrating acquired biotech companies. On the one hand, the pharmaceutical companies need to integrate the biotech companies to some extent to be able to profit from the capabilities of the acquired firms (Haspeslagh & Jemison, 1991). On the other hand, these capabilities are very context-specific (Barney, 1986; Teece, 2000) and cannot simply be integrated or transferred from the biotech to the pharmaceutical firms (Bower, 2001). Thus, pharmaceutical companies face the need to make hybrid organizational arrangements (Borys & Jemison, 1989) in order to integrate biotech companies in some way and, at the same time, to preserve the autonomy of the latter so as not to endanger the future existence of the desired capabilities.

## METHODS

Since the specific postacquisition activities involved in integration between biotech and pharmaceutical companies have not yet been analyzed (Bower, 2001), a considerably detailed approach is called for. Miles and Huberman (1994) suggested that researchers should use qualitative research designs when there is a clear need for deep understanding, local contextualization, causal inference, and exposing the points of view of the people under study. The arguments in the last section clearly demonstrate that these needs apply in the case of studying M&As between pharmaceutical and biotech companies whose competitive advantage and innovative capabilities are embedded in their specific cultural and local contexts. In earlier research, Larsson (1990) argued that case studies are particularly appropriate for the study of M&A integration, given the need for detailed, contextual descriptions of very sensitive data. The use of case studies in the context of M&As is also in line with the recommendations of Bower (2004), Hunt (1990), Javidan et al. (2004), and Napier (1989). Hence, the appropriate research methodology for a study that attempts to extend existing postacquisition integration literature is the comparative case study research methodology (Eisenhardt, 1989; Glaser & Strauss, 1967; Lee, 1999; Stake, 1995; Yin, 1984). As noted above, the central research question of this study is how to integrate an acquired biotech firm into a pharmaceutical company in a way that allows the latter to gain access to the know-how, technologies, and capabilities of the biotech firm.

The sampling of the case studies is crucial, as the choice of sample influences the results of a study (Miles & Huberman, 1994). To select cases, I identified all mergers and acquisitions between pharmaceutical and biotech companies during the 1990s. Following Powell, Koput, and Smith-Doerr (1996), I focused on firms engaged in human therapeutics and diagnostics. As European pharmaceutical companies have been especially active in acquiring biotech firms, and I had access to informants in European pharmaceutical companies, I chose mainly these companies as acquirers. U.S. biotech companies were my focal targets, given that the U.S. biotech industry is more advanced than the European biotech industry. Nonetheless, pharmaceuticals and biotechechnology are considered global industries (Van Brunt, 2000). Table 1 provides an overview of the major M&A deals analyzed in this study.

Five companies contacted about the study declined participation because of company policy and time pressures, leaving a sample of five acquisitions. When analyzing a rather small sample of cases such as this one, "extreme" research sites, also called "polar types," should be chosen (Pettigrew, 1990, 1992). Thus, this sample includes not only successful deals like Pharmacia-Sugen, but also failed deals such as the acquisitions of Genetic Therapy and SyStemix by Novartis. (This attribution of failure is based on the divestment of SyStemix [Porter, 1987], i.e., the subsequent consolidation of SyStemix with Genetic Therapy, and evaluations provided during my interviews with managers from both sides.) The comparability of the cases was enhanced by two further features of the sample: in each target and bidder pair, the two firms had similar origins, and the size difference between target and bidder was similar across all the cases. While I conducted six preliminary unstructured interviews with industry experts, I used semistructured interviews with company representatives to both obtain an appropriate degree of comparability and allow ample opportunity for unobstructed narration. The footnote to Table 1 briefly describes the company interviews and outlines the main questions asked in them. Data collection lasted from January 2000 to March 2001 and followed the principles of Yin (1984). Given the qualitative nature of most of the data sought, triangulation was one of the important means of increasing

**TABLE 1**
**Description of M&A Cases Comprising the Sample[a]**

| Bidder | Target | Year and Value of Acquisition | Characteristics of Target Company at Acquisition | Prior Relationships | Number of Interviews with Bidder/Target | Status of Acquired Biotech Firm |
|---|---|---|---|---|---|---|
| Pharmacia & Upjohn, Inc. (now Pharmacia Corp.), Peapack, NJ | SUGEN, Inc., San Francisco | 1999; $650 million | Founded 1991; 210 employees; clinical phase 2/3 | None | 1/2 | Founder left after the acquisition |
| Merck KGaA, Darmstadt, Germany | Lexigen Pharmaceuticals Corp., Lexington, MA | 1998; Undisclosed | Founded 1992; 27 employees; clinical phase 1/2 | Contact concerning patents | 2/2 | Founder still active in the company |
| Bayer Diagnostics Corp., Tarrytown, NY/Leverkusen, Germany | Chiron Diagnostics Corp., Walpole, MA | 1998; $1.1 billion | Founded 1995; 220 employees at research site; just basic research | None | 3/0 | Takeover of biotech research site part of the larger diagnostic's acquisition, head of research unit stayed |
| Sandoz AG (now: Novartis AG), Basel | SyStemix, Inc., Palo Alto, CA | 1997; $781 million | Founded 1988; 210 employees; clinical phase 1/2 | Equity stake of 60% since 1992 | 2/2 | First consolidation process intended with GTI in 1998; completely closed in 2000 |
| Sandoz AG (now: Novartis AG), Basel | Genetic Therapy, Inc. (GTI), Gaithersburg, MD | 1995; $293 million | Founded 1986; 240 employees; clinical phase 2/3 | Equity stake of 10% since 1991 | 2/2 | Second consolidation process with SyStemix realized in 2000; staff reduced by 50% |

[a] Interviews were conducted face-to-face (with one exception, which was conducted via telephone) in German or English. They usually lasted 1.5 to 2.5 hours: the longest exceeded 3 hours. The interviews were conducted in Europe (in Basel and Brussels; and in Darmstadt, Homburg, Leverkusen, and Nuremburg in Germany) and in the United States (in San Francisco, Boston, New York, and Tarrytown, NY). The positions of the people interviewed included senior scientists, integration managers, executive vice presidents, and CEOs. The semistructured interview design included the following major questions: (1) "Why did you acquire this company?" (2) "What postacquisition integration strategy has been chosen?" "Can you describe it?" (3) "What are the critical competencies of the acquired company compared to the core competencies of the acquiring company?" (4) "How did you transfer or preserve these competencies?" (5) "Can you describe the different cultures' between the companies?" (6) "How was the postacquisition integration organized?" and (7) "Would you judge the acquisition and the subsequent integration as having been successful?"

construct validity and substantiating findings and subsequent propositions (Denzin, 1978). Archival documents and detailed case write-ups, all included in the case-study database, were used. The most common documents used were SEC filings, annual reports, articles from the business and trade press, internal documents (presentation slides, executive speeches), press releases, and reports by investment banks. The issue of internal validity was handled by conducting multiple iterations and follow-ups during the analyses. I addressed the problem of reliability by drawing up detailed case study protocols and by following the required documentation and transcription standards. External validity was increased by studying multiple companies and analyzing comparative findings.

The first part of the data analysis was the transcribing of the fully taped interviews. To increase quality, I had interviewees review the transcripts and amend them if necessary. Apart from Peter Hirth, Sugen's president, the interviewees wanted to remain anonymous. Through cyclic reading and rereading, I structured each interview and coded it to facilitate within-case as well as subsequent cross-case analysis (Strauss & Corbin, 1990). In line with grounded theory research (Glaser & Strauss, 1967; Miles & Huberman, 1994), the analysis resulted in the identification of acquisition motives, organizational integration, biotech know-how and knowledge transfer, and cultural integration as main categories that formed the basis for the within- and cross-case analysis. The second step, the within case-analysis, utilized a matrix technique for comparative analysis across interviews within

one case (Miles & Huberman, 1994). The resulting matrices allowed visual identification of patterns in the integration process of each firm. The third analytic step was to develop a comprehensive case description of each case based on the identified patterns. Writing the case descriptions sometimes exposed unclear areas when pieces would not fit together. This lack of clarity resulted in additional data collection and a reanalysis of the matrices. In a fourth step, I analyzed the interviewees' feedback on the first draft of the case descriptions to check the validity of the descriptions. Apart from some minor aspects, the interviewees overwhelmingly acceped the transcripts. The fifth step was comparative analysis of the cases, utilizing the same technique, but now with an aggregated matrix. This cross-case analysis was based on the above-mentioned categories and reached closure when additional iterations did not result in a better accord between the propositions and the cases. As regards the different categories, Tables 2–5 include examples from the data; these tables provide information on each case beyond that outlined in Table 1 and serve as the basis for the case discussion in the next section. The sixth step was development of a conceptual framework for the postacquisition integra-

**TABLE 2**
**Examples from the Data for Acquisition Motives**

| Case | Short-Term Motives | Long-Term Motives |
|---|---|---|
| Pharmacia & Upjohn (Pharmacia)–Sugen | "Sugen's outstanding team of scientists has built a substantial technology including an impressive intellectual portfolio, state-of-the-art genomics . . . and a growing pipeline of candidates that will add immediate value to our research and development program."<br>"Sugen currently has four compounds in clinical trials." | "The Sugen acquisition is an important investment in sustaining P&U's long-term growth."<br>"The acquisition of Sugen is yet another example of the new strategy to supplement our internal R&D initiatives with external innovation."<br>"It [Sugen] is an absolutely unique combination of competence, knowledge, and intellectual protection." |
| Merck-Lexigen | "Lexigen . . . had a patent issued on . . . the technology of immunocytokines. This was a technology Merck wanted to get a license for, because Merck needed it for its own oncology research."<br>"Lexigen was very efficient in quickly bringing a promising project through clinical phase 1."<br>"Two oncological substances are currently undergoing clinical trials which are expected to enter the market in 2005." | "The 23% increase in our research expenditure . . . was used to boost the development of new drugs for treating cancer in particular. The same strategy was also behind the acquisition of the U.S. research company Lexigen. We aim to become one of the leading companies in the oncology sector—and we shall achieve this goal."<br>"Merck had only limited experience with biologics . . . and wanted to establish a pillar in the U.S. pharmaceutical market." |
| Bayer Diagnostics–Chiron Diagnostics | "It was the critical mass in the Central Lab, because Chiron had a very good position in the autoimmuno diagnostics area and we were there, but, of course, with the new systems that Chiron was developing that would have given us a much broader customer base. The others were the technologies, especially the DNA probes." | "Another reason was that Chiron was in one or two areas of the business we weren't in. Particularly in the nucleic acid diagnostic probes [DNA probes] which were growing at a fast rate and will become much bigger in the future." |
| Sandoz (Novartis)–SyStemix | "SyStemix had that patent issued that a lot of people thought would become really very valuable."<br>"After the first SyStemix deal, they did not get control. . . . Part of why they were making the acquisition decision was that, at least, they could control it and manage that situation."<br>"With SyStemix fully integrated into Novartis, I am confident that we will accelerate the pace of our cutting-edge work." | "We think that companies that do not have basic biotech know-how will not be able to play this game in the long term."<br>"Biotechnology is an area of particular importance for Novartis."<br>"The consolidated expertise of GTI and SyStemix is unparalleled . . . and will define Novartis' leadership for cutting-edge life sciences research." |
| Sandoz (Novartis)–Genetic Therapy | "We were in the middle of a phase 2/3 clinical study for brain tumors." | "GTI's committed involvement in the research and development of gene therapy provides a venue in which it can build ongoing relationships with internationally renowned scientists to combine their talents with GTI's expertise in technology development." |

tion of biotech companies into the structure of pharmaceutical companies. As described, these six steps are more orderly and rational than they actually were, as some overlap between steps occurred, as it does in almost all research processes.

Given the specific pharmaceutical and biotech context, a few remarks are necessary concerning data interpretation. The biotech interviewees used the term "spirit" when referring to the cultures of their firms, while the pharmaceutical interviewees always spoke of "culture." During the analysis, I considered these terms to be synonymous. Further, the individuals from both the pharmaceutical and biotech firms used "research" and "discovery" interchangeably to refer to research, the first step in the pharmaceutical value chain (the " 'R' in R&D").[1]

## CASE DISCUSSION AND FINDINGS

Given space limitations, this section primarily deals with conclusions from the cross-case analysis, but it also provides extensive information on each single case (Tables 2–5). I focus on how the pharmaceutical companies integrated the biotech firms by trying to detect commonalities and differences in acquisition motives and the realization of the organizational integration. The following sections present results from the qualitative data analysis to explain the integration topics that form the basis for the formulation of the propositions and the development of the postacquisition integration framework.

### Acquisition Motives

Javidan and coauthors (2004) pointed out that to understand the M&A process, one needs to start with the strategic thinking (motives) underlying it (Bower, 2001; Shrivastava, 1986). The motives behind each acquisition studied here were very similar; they were a desire to fill up the R&D pipeline, to gain access to potential blockbusters, and to acquire valuable biotech know-how and technologies that would enhance the acquirer's growth strategy. Interestingly, these motives turned out to be divided between short- and long-term motives. Nonetheless, although the long-term rationale behind the acquisitions was largely identical in each acquisition (support of the pharmaceutical firms' growth strategy by acquiring valuable biotech know-how and technologies), some of the short-term drivers for the acquisitions differed substantially (see Table 2). This diffferentiation supports my idea that multiple motives drive mergers (Bower, 2001; Steiner, 1975; Trautwein, 1990).

Pharmacia sought to acquire Sugen to contribute to a short-term improvement in Pharmacia's competitive position by filling the gap in the firm's first and second phases of clinical development and by gaining access to potential blockbusters. Furthermore, strengthening its oncology business in the United States and growing by gaining new biotech know-how and technologies were to support the overall long-term strategy and motives of Pharmacia.

At Merck, the short-term motives for the acquisition of Lexigen were gaining a new and promising technology platform, two interesting oncology products with a chance of becoming blockbusters, the patent of immunocytokines that Merck needed in order to continue with its own research. This latter point is also the special short-term driver for this acquisition. The long-term strategic objectives were fostering Merck's position in the oncology sector, strengthening its presence in the U.S. pharmaceutical market, and gaining access to the Boston research community and to valuable biotech know-how and technologies.

Bayer Diagnostics' acquisition of Chiron Diagnostics was different in that it also included the acquisition of the more traditional diagnostics business. Thus, through the acquisition Bayer improved its competitive position by responding to the consolidation process in the diagnostics industry, getting access to new customers, and increasing efficiency. Part of this transaction was the acquisition of the NAD (nucleic acid diagnostic) business, the biotech part of Chiron Diagnostics, located at a separate site in Emeryville, CA; acquiring the NAD business contributed to Bayer's long-term growth by providing it with access to valuable technologies. Bayer considered the NAD business a high-growth segment with potential future annual growth rates of up to 20 percent.

Novartis's short-term interest in acquiring SyStemix and Genetic Therapy was the hope of getting a blockbuster, as both companies had very promising patents and products in the pipeline. Moreover, the full acquisition of SyStemix in 1997, following acquisition of a 60 percent stake in 1992, was driven by the specific desire to get control over SyStemix, whose management had frequently stated that (1) they needed to act in the interest of all shareholders, not just in the interest of Novartis, and (2) it was difficult to do deals with other companies with

[1] The term "doing good science," also used by interviewees refers to the the biotech firms' research capabilities—that is, their ability to identify promising targets and compounds.

Novartis holding so much stock. The overall long-term rationale behind these two acquisitions was a perceived need to be active in the biotech sector in order to participate in the expected growth of this industry.

*Proposition 1a. When acquiring biotechnology firms, pharmaceutical companies tend to pursue the short-term motive of improving their market positions by filling their R&D pipelines and gaining potential blockbusters.*

*Proposition 1b. When acquiring biotechnology firms, pharmaceutical companies tend to pursue the long-term motive of supporting their overall growth strategies by accessing biotechnology know-how and technologies.*

### Organizational Integration

Integration serves to coordinate and control the activities of combining organizations, allowing realization of the potential interdependencies that motivated the acquisitions (Shrivastava, 1986). Given the big differences between pharmaceutical and biotech companies in terms of organizational structure and culture (also see Table 5) (Powell, 1996), existing postacquisition integration typologies (Haspeslagh & Jemison, 1991; Nahavandi & Malekzadeh, 1988) suggest granting acquired biotech companies a high degree of autonomy, or day-to-day freedom to manage their businesses (Datta & Grant, 1990). However, the case analysis revealed that different integration strategies with different degrees of autonomy had been used, suggesting a

**TABLE 3**
**Examples from the Data for Organizational Integration**

| Case | Realization of the Organizational Integration |
|---|---|
| Pharmacia & Upjohn (Pharmacia)–Sugen | "With Sugen, we also gained a number of very talented scientists—absolutely world-class. Putting that together is actually quite difficult. . . . We will keep Sugen as an entity and continue with its identity." |
| | "It was possible to make local decisions with respect to the overall strategy developed at Pharmacia. As far as the day-to-day management was concerned people at Sugen had a lot of freedom." |
| | "At the very beginning, Sugen was totally removed from the strategy process. But, the more interactions occurred and the more resources were transferred to Sugen, the more involvement was necessary." |
| | "Sugen is in charge of the projects in clinical phase 3 and receives support from Pharmacia, if necessary. After that, Pharmacia is responsible for worldwide sales and marketing." |
| Merck Lexigen | "At the beginning, everything was supposed to be in the hands of Lexigen including clinical development." |
| | "Stephen Gillies [founder of Lexigen] continued to be their boss. They [employees] did not care about the integration, because they were not affected. Only those involved in the development project, about four–five people, were affected." |
| | "They [Lexigen] have all freedom in doing research." |
| | "As far as reporting and controlling is concerned, everything is managed by EMD." |
| | "[. . .] the separation of research and development and, by this, to say, that Lexigen should do what it can best—research—was an appropriate decision. But it was not the original intention." |
| Bayer Diagnostics–Chiron Diagnostics | "These guys were pretty much independent in the San Francisco Bay Area: . . . So, there were some clear messages, quickly said, there are some things we are not going to change." |
| | "It is still operating with a high degree of autonomy and independence. They are not yet integrated. There is no question about that." |
| | "First, look at what you can modify more rapidly, which are the functions, the staff and the management. You have to leave R&D in the first step because that takes some time and you are really concerned about moving brain, skills, etc." |
| | "So, I would say on that side there has been integration with what we manufacture in NAD. That is more integrated, but not R&D" |
| Sandoz (Novartis)–SyStemix | "After the acquisition, SyStemix was completely integrated in the matrix organization of Novartis with all procedures, organization, etc." |
| | "After the acquisition, a few people were sent to Palo Alto in order to ensure a smooth transition." |
| | "I think a company like Novartis is still evaluating, 'Do we need to control the whole company to get the maximum benefit?' And the other question is, 'When do you need control?' But you can't make a straight statement about that. You need to look at each company case by case, what is the technology, what is the timing, etc." |
| Sandoz (Novartis)–Genetic Therapy | "The research unit should retain their autonomy . . . and will be maintained at full strength." |
| | "We floated around a little bit, and also at the beginning we resisted, because we thought at first it was gonna be more independent." |
| | "We were doing a pivotal study. . . . We did it in 12 countries with different and complicated regulatory issues. . . . Those are the things a company like Novartis can really help you. They really understand clinical trials at multiple sites in multiple countries." |

more complex process (see Table 3). Realization of some of the short-term motives called for an immediate absorption of an acquired biotech company, while the long-term motives could only be realized with a preservation approach. First of all, this shows that diverse motives require different extents of integration (Bower, 2001; Shrivastava, 1986). Moreover, it becomes obvious that the existing postacquisition integration typologies do not work in this context as they only propose single-stage approaches that do not explain and cover the complexity observed in the cases. Consequently, one needs to distinguish between two different kinds of integration approaches that require different paces of integration.

In the case of Pharmacia, the overall integration strategy was to grant Sugen as much autonomy and independence as possible. In the words of Peter Hirth, Sugen's president:

> There was a clear commitment by Pharmacia to keep Sugen independent—as far as possible. They tried to retain our identity, our name, and so on.

The strategic decision making for Sugen was in the hands of Pharmacia. Sugen had its freedom in the day-to-day management of its business, especially in research, in which Pharmacia did not interfere. This freedom was granted until the clinical trials were finished, as Sugen was already far advanced in clinical Phase III.[2] After that, Pharmacia would manage sales and marketing, which are considered as the core competencies of a pharmaceutical company.

Similarly, Merck's overall strategy was to grant Lexigen a very high degree of autonomy. In contrast to the other cases, however, a change occurred in the original integration plan after the acquisition became effective. At the beginning, Lexigen was to cover the complete pharmaceutical value chain. Although this intended strategy was never even realized, it had already led to some problems between Merck and Lexigen, as the following interview quotation from an executive of Lexigen reveals:

> When the small company was first acquired, there was a very clear statement by the CEO of Merck that the small company should retain some of the attributes that make it small, dynamic, and very fast. . . . The same day that this comment was made, we began to receive instructions from other divisions within Merck, how we should operate to be like Merck. . . . So, it continues to be expected within Merck that we will do things in conformity with the way things are done at Merck, but it is also expected that we operate with a high level of independence and some level of separateness.

Furthermore, the original integration plan for Lexigen was changed and its task was reduced to basic research. Interviewees portrayed Merck's intent as having Lexigen be a "center of excellence within Merck," which, as one interviewee pointed out, also "created quite a stir." Lexigen was granted total freedom to do basic research and generate promising drug candidates, which would then developed and commercialized by EMD Pharmaceuticals, Inc., Merck's U.S. pharmaceutical subsidiary. This decision was made because EMD was considered as having more experience and competence with clinical development and bringing a drug to market.

In the case of Bayer Diagnostics and Chiron Diagnostics, different integration strategies were deployed for specific segments. The biotech part of Chiron Diagnostics, the NAD segment, was granted a very high degree of autonomy and independence in the day-to-day management of its business: they kept the same boss, and Bayer decided to leave the NAD business alone as this part was very research-driven and dominated by a biotech culture. From a strategy-making point of view, the NAD segment was completely integrated into the overall strategy-making process of Bayer Diagnostics, which in turn was integrated into the long-term strategy of the Bayer Group. Obviously, responsibility was also clearly divided between the early stages in the value chain (i.e., basic research) and the final stages.

Despite the 60 percent stake Novartis had held in SyStemix since 1992, SyStemix acted on its own before the final full takeover in 1997. After that, to ease the integration process, to gain control over SyStemix, and to make people there familiar with the structure, processes, and procedures at Novartis, a number of senior managers from Basel were brought in to act as integration managers, and SyStemix was completely integrated into the matrix organization of Novartis. The reason behind this strategy was that Novartis was experiencing difficulties in its dealings with SyStemix. The interviewees stated that given this and the fact that Novartis had put almost a total of $800 million into this firm, Novartis wanted to gain some control.

In the case of Genetic Therapy, according to one interview, "There was a lot of talk about keeping it

[2] Clinical trials are research studies to answer specific questions about new therapies or new ways of using known treatments. They are used to make sure new medicines or treatments are both safe and effective. Drug clinical trials are commonly classified into three phases, and the drug development process will normally proceed through all three stages over many years.

relatively independent, but in fact very quickly it became 'rather' fully integrated." This statement reflects the major problem Novartis encountered with the acquisition of both biotech companies: the expectations on the part of the biotech companies had been that they would be granted complete autonomy in almost all stages of the pharmaceutical value chain, whereas Novartis first tried to get to know and control the acquired companies, especially SyStemix, and then decided to grant autonomy only for the research area. Thus, two different integration strategies can be identified. In the case of projects where clinical trials were at advanced stages, there was full integration—that is, Novartis tried to assume full responsibility—while in the case of research functions, the biotech firms were to retain complete autonomy. The degree of autonomy granted depended on an analysis of the core competencies of each biotech firm with respect to the pharmaceutical value chain and the competencies of the pharmaceutical company. However, it is important to note that the two integration approaches were not pursued simultaneously from the beginning; rather, the "control issue" was dealt with before the "autonomy issue" was given consideration. This is one of the main differences from the other cases that might be partly responsible for the failure of the Novartis's acquisitions, as Novartis did not respect the biotech firms' specific need for autonomy from the beginning. Instead, Novartis first tried to gain control before granting a high degree of autonomy to the R&D portions.

In sum, the above findings provide some insights into my research question, which asks how the integration of biotech firms is carried out. The similarity across all cases examined here is that the acquiring pharmaceutical companies grant a high degree of autonomy as far as R&D is concerned and apply a slow preservation approach in this context. However, the management of each specific integration process differed: Novartis and Bayer engaged integration managers to realize the integration, whereas Merck introduced an interface manager, a German scientist newly employed by Lexigen who was to manage the relationships among Merck, EMD, and Lexigen. In the case of Pharmacia and Sugen, it was Peter Hirth, Sugen's President, who acted as the linchpin between the two companies.

Furthermore, it becomes clear that the degree of autonomy (Datta & Grant, 1990) granted differs in each acquisition according to the identified competencies of the biotech company involved. Sugen covered the pharmaceutical value chain up to the clinical phases. SyStemix was fully integrated into the structure of Novartis but was finally consolidated with GTI, which was granted a degree of autonomy for its current clinical Phase II/III tumor project. After this project and the consolidation with SyStemix, the autonomy of GTI was to be limited to the field of research, which was also the degree of autonomy granted to Lexigen and Chiron from the beginning. By contrast, in all cases, regulatory approval and worldwide sales and marketing were to be carried out by the pharmaceutical companies.

Moreover, the different within-case analyses revealed that financing, budgeting, and reporting were completely integrated and done according to the requirements of the pharmaceutical firms. Sugen reported directly to a board member at Pharmacia. The financing and controlling mechanisms were adjusted according to the requirements of Pharmacia. The same took place in the relationship between Genetic Therapy/SyStemix and Novartis. In the relationship between Bayer Diagnostics and Chiron Diagnostics, the responsibility for finance and IT was in the hands of Bayer Diagnostics, and the respective systems and processes were also transferred to Chiron Diagnostics. All in all, and similarly across all cases, the supporting functions were not regarded as that critical to integrate because they were not the primary value drivers in these acquisitions—in contrast to the R&D functions.

*Proposition 2. When acquiring biotechnology firms, pharmaceutical companies mainly focus on the rapid integration of all non-R&D-related portions of the acquired businesses, while the R&D-related portions retain a high degree of autonomy.*

### Biotech Know-how and Knowledge Transfer

The aim of gaining access to biotech know-how and knowledge through acquisition (see Table 4) is not a clear case of either external (Lane & Lubatkin, 1998) or internal (Zander & Kogut, 1995) know-how and knowledge transfer, because even after the closing of a deal, the two companies are still far from being a united entity. At the same time, such an acquisition is not a clear case of external know-how and knowledge transfer either, because after the closing of the deal the two companies are part of the same legal entity.

Schoenberg (2001) found that an organization's ability to successfully transfer knowledge after an acquisition consistently fell short of expectations. Given this problem, along with the importance of the biotech know-how of the acquired firms as a long-term motive for all these acquisitions, some further remarks are necessary to define that vari-

**TABLE 4**
**Examples from the Data for Biotech Know-how and Knowledge Transfer**

| Case | Biotech Know-How and Knowledge Transfer |
|---|---|
| Pharmacia & Upjohn (Pharmacia)–Sugen | "Indeed, there have been activities carried out that enabled our colleagues at Pharmacia to use our technology, especially everything that concerned the genes and the targets. All of this was catalyzed by certain project meetings, presentations, and discussions." |
| | "With such a deal, know-how can only be acquired." |
| | "There have also been a few projects in which we had to realize that it did not make any sense to work on targets at two different sites. Hence, some of the targets were moved to Italy and these activities had then been stopped at Sugen. Instead, other activities from Pharmacia came to us." |
| Merck-Lexigen | "Those researchers at Lexigen had much more experience and know-how with proteins than the people at Merck." |
| | "The biotech-expertise is at Lexigen. Part of it has also been transferred, i.e., the things that have been done at Merck were reduced and transferred to Lexigen. Merck decided to focus on small-molecules, whereas Lexigen is supposed to be responsible for biologics." |
| | "Lexigen is one of Merck's key research facilities. . . . Lexigen has a specific research focus on protein pharmaceuticals that complements Merck's focus on chemical drugs. Merck has designated Lexigen its worldwide center of excellence for biological entities." |
| | "Lexigen is an important research center for Merck, one of the most important suppliers for the biotech activities of Merck." |
| Bayer Diagnostics–Chiron Diagnostics | "No, that knowledge has not been transferred, because it is indeed very special. And, I don't think it will be transferred unless there is really a major change in the organizational structure." |
| | "I think that it was all natural that people did not move on the R&D side. Some people left anyway, because they were offered good jobs." |
| Sandoz (Novartis)–SyStemix | "But the transfer of knowledge was not promoted; it was only in the interest of the scientists." |
| | "You can acquire people with their knowledge and technology, but both are very closely related to a specific site. You can't transfer neither people nor technology. . . . As long as you keep up the site knowledge remains more or less within the site." |
| Sandoz (Novartis)–Genetic Therapy | "We didn't transfer know-how or technology from GTI to Novartis. It was not necessary." |
| | "We did perhaps a little bit of that [knowledge transfer], but more in support of other people's program. We were rather acting as a center of excellence." |
| | "GTI is now established as the Novartis center of excellence for gene therapy. I give you an example: Novartis had transplantation activities from animal into human organs, in which we had the technology to study that question for that specific transplantation problem, even though we were not active in this area. And so, we developed techniques to support their transplantation." |

able more precisely. Knowledge is an elusive concept that has been classified and defined in a variety of ways. For the purpose of this study, I distinguish between "biotech know-how" and "biotech knowledge." *Biotech know-how* refers to relatively tacit know-how, which Kogut and Zander (1992) characterized as the accumulated practical skill or expertise that "allows somebody to do something." Know-how refers to the research capabilities of the biotech firms that form the basis for their innovative research results, capabilities, and technologies. In contrast, "biotech knowledge" is the final, explicit findings—the information or the "know-what"—that accommodate more articulate dimensions resulting from the biotech research. This latter knowledge is transferred to pharmaceutical companies to enable them to continue with their work.

In respect of the transfer of knowledge and know-how, the data analysis indicated that there was no explicit biotech know-how transfer, but only a biotech knowledge transfer from the acquired biotech companies to the acquiring pharmaceutical companies. Thus, the know-how/knowledge transfer in M&A deals between pharmaceutical and biotech companies needs to be analyzed and realized very carefully, because it is especially complex and difficult under the transitional organizational conditions created by acquisitions (Ranft & Lord, 2002). The biotech knowledge transfer took place to enable the pharmaceutical companies to continue their work on the basis of information provided by the biotech firms in order to realize their short-term motives linked with the acquisition. The reason there was no biotech know-how transfer was that only the biotech parts had the specific know-how (Cohen & Levinthal, 1990) to carry out the specific research activities contributing to the realization of the long-term motives linked with the acquisitions. This observation, which emerged in all the cases, is consistent with the need for different integration approaches concerning R&D and non-R&D related portions (see also Table 3). In the deal between Pharmacia and Sugen, some biotech know-how transfer took place. After the acquisition, there had been a common review process of all research

projects at Sugen. It was decided to stop some of the projects at Sugen, and two of Sugen's research targets were transferred to Pharmacia's site in Italy, which had also been working independently on them. Nothing similar happened in the other cases, in which the transfer of projects was only from the pharmaceutical to the biotech companies. In connection with this transfer, people at Pharmacia received information about the transferred genes and targets necessary for the continuation of their work. Besides, a basic exchange of biotech know-how took place during collaboration in different project teams. Some projects at Pharmacia were stopped and transferred to Sugen, which was considered a center of excellence within Pharmacia.

Quite a similar picture emerged from the collaboration between Merck and Lexigen. There was no transfer of biotech know-how from Lexigen to Merck; instead, two projects at Merck were stopped and transferred to Lexigen, which was henceforth considered a center of excellence within Merck. The following quotation from an integration manager supports this view:

> It was decided that most of the biologic research is to be with Lexigen. Their main responsibility lies in the biologic research. It can be seen as a center of excellence. . . . Most of the biotech-expertise is at Lexigen. The immunocytokines are a pilot project, they have been developed here and the know-how is also here.

The necessary biotech knowledge concerning the proteins for further development at EMD Pharmaceuticals was to be provided by an interface manager. Further, Lexigen was not to be involved in the further development activities at EMD Pharmaceuticals/Merck.

Nor did Bayer Diagnostics ever have the intention of transferring the biotech know-how from the NAD segment to any other site at Bayer. This segment was dominated by research activities built on special know-how created by a group of people who were very different from the rest of the company. Thus, Bayer decided to transfer neither the biotech know-how nor the people because Bayer's management knew that this know-how was very specific. They only transferred some manufacturing from Emeryville, California, to Walpole, Massachusetts; this implied the transfer of some biotech knowledge, but no R&D know-how.

During the integration of Genetic Therapy and SyStemix, no systematic transfer of biotech know-how was carried out because Novartis considered that know-how part of the group, and one project was transferred from Novartis to SyStemix. Stressing the importance of local and regional networks, the interviewees pointed out that an important reason why no explicit transfer of biotech know-how occurred was the awareness that the value of this know-how was closely related to the specific site of the company. There was only some basic exchange during presentations, project collaboration in projects, and job rotation of scientists from Novartis into SyStemix or Genetic Therapy. A Novartis scientist commented:

> It has never been the goal to transfer know-how or technologies. If it [gene therapy] is interesting, you are going to do it there [SyStemix]. . . . As a global company, we can keep the know-how where it is.

The transfer of biotech knowledge only took place to support the worldwide clinical trials. Finally, both companies were considered centers of excellence for gene therapy and vector technology within Novartis and supported the other units of Novartis with their projects. Additionally, the project pipeline of SyStemix was reviewed and reduced significantly by concentrating and focusing efforts on the most promising projects. This was carried out in a common review which involved people from both sides, SyStemix and Novartis—the same process was carried out after the acquisition of Genetic Therapy.

*Proposition 3. When pharmaceutical companies acquire biotechnology companies, there is mostly a transfer of general biotech knowledge from the biotechnology to the pharmaceutical company, while the specific biotech know-how remains within the biotechnology company.*

*Proposition 4. The more specific the biotech know-how within an aquired biotechnology company, the more autonomy it is granted by an acquiring pharmaceutical company, and the sooner it becomes an independent center of excellence within the pharmaceutical company.*

### Cultural Integration

First of all, the industry description as well as the case findings revealed the big cultural gap between pharmaceutical and biotech companies. Second, the difference in culture had an importance that went beyond its being problematic for postacquisition integration (Nahavandi & Malekzadeh, 1988): the biotech culture, with its strong entrepreneurial element, was also an inherent part of the organizational capabilities (Barney, 1986) of the biotechnology companies. Third, the obvious national cultural differences between the European acquirers and U.S. target biotech firms was of no major relevance to the integration process, according to all

**TABLE 5**
**Examples from the Data for Cultural Integration**

| Case | Cultural Differences between Pharmaceutical and Biotech Firms | Consequences That Arise out of the Different Cultures |
|---|---|---|
| Pharmacia & Upjohn (Pharmacia)–Sugen | "They know that there is no job security and that there are high risks involved in terms of running out of money or failures. People at Sugen must accept this high-risk proposition. They have a different relationship to authority because they are more 'rebellious,' are questioning authority, and are always saying what they are thinking."<br>"One should keep biotech as it is, biotech. Innovations emerge there and not within big pharma. All of this has also an entrepreneurial element, which fosters innovation." | "Such deals do not produce innovation; they only serve as growth drivers. The intellectual capital in terms of people emigrates, because it needs its own freedom and wants to earn money."<br>"There is of course the danger that Sugen will lose the people with this specific risk profile. It is possible to accept it for a while, especially as long as you are granted certain autonomy, but then one has to realize that it is no longer the same as it is used to be."<br>"After the acquisition, Sugen is part of a 'bigger picture,' in which it does not longer control itself." |
| Merck-Lexigen | "Because of the corporate structure and culture within Merck there is an inability to make decisions."<br>"Biotech is not operating by being conservative. Biotech operates by taking risks, by being dynamic, by moving very quickly, by trying different ideas on a trial base. If it works, you continue. If it doesn't work, you try something else. In the movement it is very, very quick." | "Well, for a small biotech company to fail to achieve a goal for two years means the death of the company. In the structure of a big company that is not true, it is acceptable to continue to fail this goal, because it is just not a small biotech company anymore. . . . So, the effect having the structure behind it allows the failure to take place that could not take place when we are on our own." |
| Bayer Diagnostics–Chiron Diagnostics | "There was a much bigger gap of culture etc. between Bayer Diagnostics and the NAD-Group, nucleic acid group, in Emeryville, who were much more the Chiron people and the biotech-research-orientated people." | "I think a major issue is that Bayer does not have stock options, Chiron does. Fortunately our packages in terms of salary and bonuses are very good. . . . But it does not make up the difference especially in a booming economy like through the 90s." |
| Sandoz (Novartis)–SyStemix | "It is complicated, because decisions were not straightforward due to the fact that you were always making decisions under uncertainty." "I think that integrating the company was decay to the culture, but also brought in a lot of resources." | "I think one view of these kinds of relationships is the failure that they kill the entrepreneurial spirit of these companies. . . . but I recognize toward the ultimate objective of developing a therapy for a disease it is probably better." |
| Sandoz (Novartis)–Genetic Therapy | "Nearly everybody [of the senior management at GTI] left, because they [Novartis] no longer looked for a local management team. We were used to make common decisions, taking much more risk and common responsibility. And they no longer looked at the local management to really do that so much." | "You won't get entrepreneurial behavior out of a company like GTI. It does still not longer expect to act that way."<br>"Stock options are part of the culture. It was something that changed the culture, because before everybody at GTI had options." |

the interviewees. In keeping with findings from Inkpen and his colleagues (2000), the only point of difference was that the European companies did not grant any or as many stock options. Fourth, instead, the cultural differences between a big pharmaceutical and a small biotech firm, depicted in more detail in the following analysis (see Table 5), played a much crucial role in all cases, which is consistent with the findings of Very, Lubatkin, Calori, and Veiga (1997), who noted that organizational culture differences may be as disruptive to successful postacquisition integration as national cultural differences. The main cultural shift resulted from the biotech firms' passage from being entrepreneurially driven companies covering the complete pharmaceutical value chain by striving to bring their own drugs to market to being more research-oriented companies with the objective of discovering promising research targets and compounds.

In the acquisition of Sugen by Pharmacia, the management at the latter was aware of the negative impact cultural differences might have, because Pharmacia had just undergone the merger between Pharmacia AB and the Upjohn Company to form Pharmacia & Upjohn. Subsequently, the acquisition of Monsanto took place, resulting in the formation of Pharmacia. Thus, Pharmacia granted Sugen the

maximal possible autonomy. In the words of Peter Hirth:

> People coming to Sugen have a completely different mentality. . . . They are more focused on innovation. You cannot really compare those cultures. Either you keep the culture as it is or it disappears automatically.

Despite the chosen integration strategy, the acquisition and subsequent integration of Sugen into Pharmacia resulted in a fundamental cultural shift from being a highly risk taking, innovation-driven, and entrepreneurially driven small biotech company to being a more research driven organization with a clear focus on doing good research, identifying promising compounds, and acting as an important center of excellence within Pharmacia.

In the collaboration between Lexigen and Merck, the cultural differences between big pharma and small biotech caused some trouble because Lexigen was no longer expected to be a fast-acting, highly dynamic, highly risk taking, and entrepreneurially driven company. It was expected to do basic research and generate promising drug candidates. Consequently, Lexigen needed a culture focused on discovery rather than on entrepreneurship. After the acquisition, it became, according to an interviewee, "part of a bigger picture" and needed to "follow different rules." Thus, it lost some of its former identity and attributes. Another important problem in this case, as in the other cases, was the pace of decision making, since the biotech companies were now part of the rather slow decision-making processes of pharmaceutical companies while used to "being dynamic, moving very quickly" (from an interview).

In the case of Bayer Diagnostics and Chiron Diagnostics, Bayer was also aware of the big cultural gap between itself and the biotech-driven NAD business segment. This can be observed in the following quotation from an integration manager at Bayer:

> We knew that the NAD [nucleic acid diagnostics] people were different, but we didn't really expect them to be so different.

As a result, Bayer decided to apply the organizational integration strategy described above and tried to preserve the independence and autonomy of this segment. Bayer, like the acquirers in the other cases, found that employees in U.S. biotech companies expected to receive stock options, as these were part of their entrepreneurial culture, stressing the ownership aspect of their connection with their employers.

After being acquired by Novartis, the management at Genetic Therapy was no longer expected to take huge risks and to act in an entrepreneurial way because the company had been turned into a research facility of Novartis. As a former top executive at Genetic Therapy commented:

> Now, it is more like a Novartis research facility. I must say that whatever entrepreneurial spirit that exists at the research facilities of Novartis all around the world, the same spirit exists at GTI. But, that's different from being an independent company.

Novartis was to a certain extent aware that such a cultural change would take place. Hence, its goal was never to keep up the specific spirit of the biotech firms as it had existed before the acquisitions; instead, it tried to get some control over the biotech firms and focused efforts on the ultimate objective of bringing drugs to market. This focus was in clear contrast to the steps taken by the acquiring pharmaceutical companies in the other cases.

The above case findings suggest that the culture of an acquired biotech firm changes after an acquisition as it is no longer an independent and entrepreneurially driven firm with a lean and dynamic organization making it possible to make quick decisions and to create innovations. Although there was a cultural awareness in all cases concerning these fundamental differences, the derived consequences differed significantly. While Novartis did not try to maintain the "spirit" of its two acquired biotech companies—rather, it tried to deal with the "control issue" before the "autonomy issue"—the other pharmaceutical companies tried to protect the specific cultures of the acquired biotechs by granting a high degree of autonomy to the R&D parts from the beginning. Thus, in the case of Novartis, there was only little chance of protecting the biotech culture as the acquirer did not respect the need for autonomy from the beginning. In view of the importance of the biotech culture as part of and precondition for the biotechs' organizational capabilities, this might be one reason for the failure of these acquisitions.

Of course, being part of the structure of a large pharmaceutical company also changed firm culture in the other cases and led to perceived destruction of the entrepreneurial spirit. This experience made most of the top managers at Sugen, SyStemix, and GTI leave the companies. However, most of the R&D people stayed. In the case of Chiron, the head of the research unit stayed, whereas some of the R&D people left. At Lexigen nobody left because the top people were bound by contract. Nonetheless, respecting the biotech companies' need for autonomy may help to preserve desired R&D capa-

bilities. The reason for this is that the importance of the R&D people increases owing to their specific biotech know-how. After acquisition, the focus is on doing biotech research, so their role becomes even more important than the role of an acquired firm's top managers, making the researchers' particular biotech (working) culture worthy of protection.

*Proposition 5. The higher the degree of integration of an acquired biotechnology company into a pharmaceutical company, the more the biotech's culture changes from entrepreneurially driven to research-driven.*

### Acquisition Performance

Over the years, the performance of mergers and acquisitions has been measured in a variety of ways, but so far there is no consensus on a common way of measuring M&A success (Javidan et al., 2004; Larsson & Finkelstein, 1999). In this study, I used a two-step approach to consider the success or failure of acquisitions. First, I analyzed whether acquired businesseses had been divested in order to assess M&A success (Montgomery & Wilson, 1986; Porter, 1987). Second, I asked interviewed managers whether they considered the acquisition in which they were involved to have been a success (Hunt, 1990; Kitching, 1967).

On the basis of the first criterion, the acquisitions of Sugen, Lexigen, and Chiron Diagnostics have been successes because these businesses have not yet been divested. In contrast, the acquisitions of SyStemix and Genetic Therapy by Novartis can be considered failures because SyStemix has been completely closed down and consolidated with Genetic Therapy, and staff at Genetic Therapy has been cut by more than half.

A comparison of the results as based on the divestment criterion with the evaluations provided by the interviewees leads for the most part to the same conclusions. In the deal between Pharmacia and Sugen, the overall evaluation is reflected in the following quotation taken from an interview:

> The integration was surely a success. . . . In the end, I think that it was a good deal for everybody.

The postacquisition integration process of Pharmacia, when viewed in the light of my five propositions, reveals that Pharmacia largely followed the suggested new postacquisition integration framework, which is presented in Figure 1 below, with one exception: the transfer of some biotech know-how from Sugen to Pharmacia.

As regards the evaluation of the postacquisition integration of Lexigen by Merck, the reactions of the interviewees were mixed because the original plan (already described above) of granting Lexigen a very high degree of autonomy (by covering the complete pharmaceutical value chain, i.e., applying a preservation approach) was changed a few weeks after the acquisition. The original plan had made Lexigen's employees expect a very high degree of autonomy, and when the integration plan was changed, some problems cropped up. The second integration plan, which followed the propositions of the postacquisition integration framework, led to some of the interviewees considering the two companies to be on the right track towards making the acquisition a success. Nonetheless, some employees at Lexigen remained not completely satisfied, because the expectations raised by the original integration plan were not met and, thus, they did not consider the acquisition a success.

The acquisition and integration of Chiron Diagnostics by Bayer Diagnostics was considered to have been a success, as the following quotation taken from an interview with an integration manager at Bayer reveals:

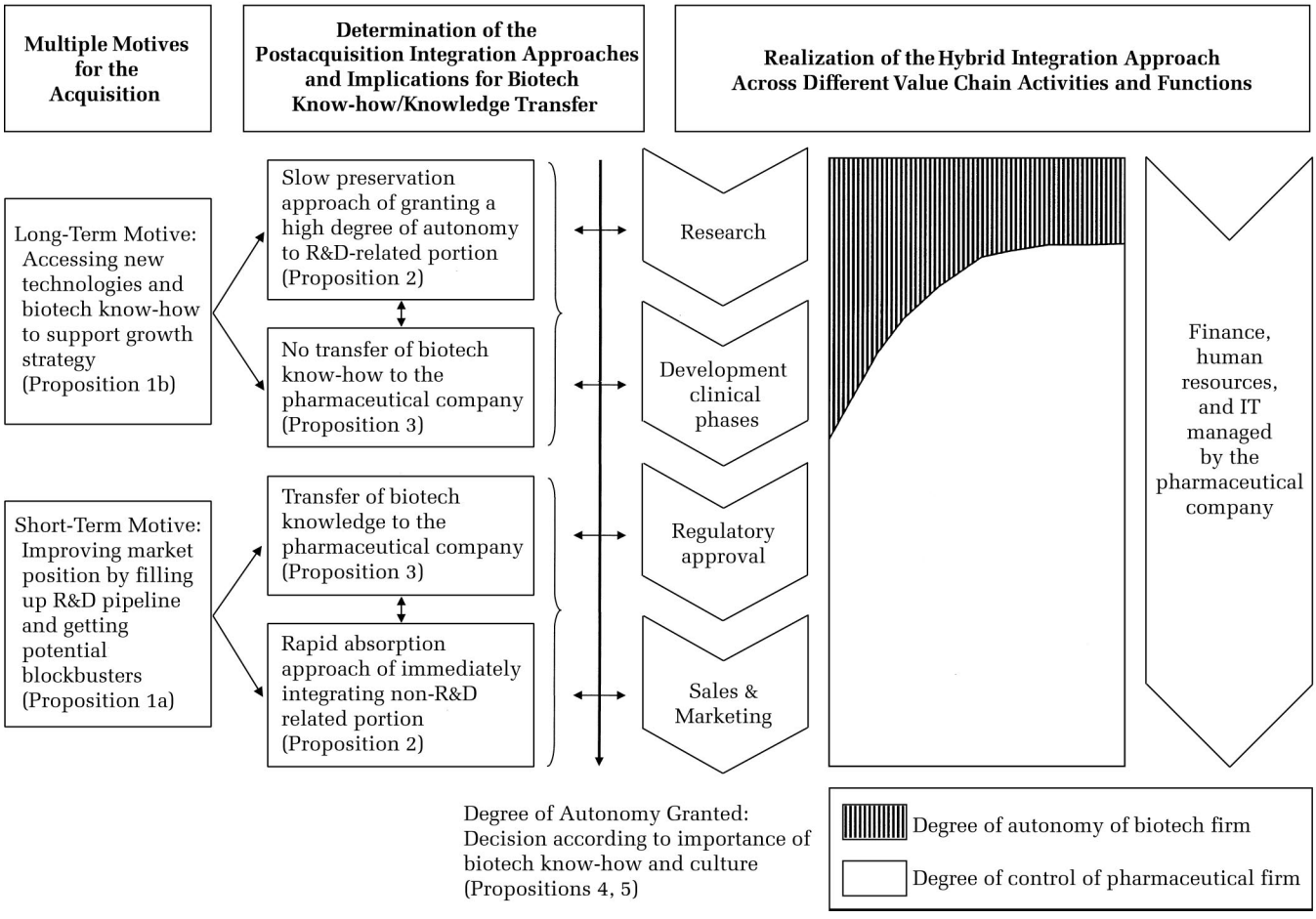
> So, I think for us it went as smoothly as it could have, even though we obviously lost some people.

Moreover, the president of Bayer Diagnostics was invited to report to senior managers at Bayer's headquarters on experiences during the acquisition and to draw on these experiences to show how to effectively carry out an integration. With respect to the different steps of the postacquisition integration process, Bayer followed in their entirety the sequences proposed in my hybrid postacquisition integration framework.

According to the divestment criterion, the acquisitions of SyStemix and Genetic Therapy were considered failures. Interviewees' evaluations supported this conclusion. The interviewees stated that both acquisitions had failed, especially the acquisition of SyStemix, which had completely closed down. In terms of my proposed postacquisition integration framework, Novartis basicially pursued two different integration strategies. However, it is important to note that the two integration approaches were not pursued simultaneously from the beginning; rather, Novartis sought to deal with the "control issue" (the integration of the acquired businesses) before addressing the "autonomy issue." Consequently, Novartis did not respect the biotech firms' specific need for autonomy from the beginning and was not able to retain their spirits, though "spirit" is a significant aspect of the organizational capabilities of a biotech firm (Barney, 1986).

In sum, the above discussion reveals clear per-

**FIGURE 1**
**Postacquisition Integration Framework: Toward a Hybrid Approach**




formance differences among the acquisitions in this research sample. When considering the relationship between the performance of an individual acquisition and the degree to which integration followed the propositions of the postacquisition integration framework developed here, one may conclude that the more acquiring pharmaceutical firms follow these propositions, the better the performance is. Pharmacia and Bayer almost completely followed the developed framework and achieved the best performance. Since the original integration plan of Merck was not realized, but the second integration plan followed the steps suggested in the framework, the evaluations of the acquisition are mixed. The integration of SyStemix and Genetic Therapy by Novartis did not follow the suggested hybrid structure: Novartis focused first on control and only then on autonomy, a sequencing that probably partly explains the failure of the Novartis acquisitions.

*Proposition 6. The more pharmaceutical companies follow a hybrid postacquisition integration approach when integrating acquired biotech companies, the more successful the acquisitions will be.*

## TOWARD A NEW POSTACQUISITION INTEGRATION FRAMEWORK

This study investigated how pharmaceutical companies integrated biotech firms and resulted in the development of a postacquisition integration framework, which is presented in Figure 1. With this, this study answers the call by Bower (2001) for empirical research on pharmaceutical companies' R&D acquisitions. The next contribution of this paper is that the research results provide considerable support for the need to treat M&As as multidimensional and multifaceted phenomena (Javidan et al., 2004) driven by different motives (Bower, 2001; Steiner, 1975) as pharmaceutical companies pursue different motives (Propositions 1a and 1b), especially the desire to acquire specific technological know-how and technologies (Ahuja & Katila, 2001).

The next contribution of this study is the development of a postacquisition integration framework that calls for a hybrid integration approach with simultaneous short- and long-term orientations and segmentation across different functions and value chain components. I argue that it is necessary to systematically go beyond an overall, single integration approach in order to appreciate the complexity and many facets of M&As. Applying only one integration approach is not enough, because different motives may call for completely different integration approaches. The integration of acquired biotech firms requires the simultaneous application of two distinct integration approaches concerning R&D and non-R&D-related portions (Proposition 2). Choosing the right integration approach is important (Chakrabarti, 1990; Larsson & Finkelstein, 1999; Pablo, 1994) and depends on granting the necessary degree of autonomy (Datta & Grant, 1990) to an acquired biotech.

Why is such a hybrid integration approach necessary? Hybrid organizational arrangements are those in which two or more sovereign organizations combine to pursue common interests (Borys & Jemison, 1989; Powell, 1987). There is a clear need for biotech and pharmaceutical companies to cooperate after acquisitions to create value (Haspeslagh & Jemison, 1991). This imperative raises the problem of how to coordinate and combine the organizations (Birkinshaw et al., 2000) as well as the problem of how to allocate control between them (Borys & Jemison, 1989). Hybrid organizational arrangements are necessary because pharmaceutical companies pursue different motives (Propositions 1a and 1b) that in turn require different integration approaches (Proposition 2) depending on the know-how and competencies of the biotech firms (Proposition 3).

To correctly decide what kind of integration approach to apply, an acquirer needs to compare the core competencies (Barney, 1991; Leonard-Barton, 1992; Prahalad & Hamel, 1990) of its target biotech company with its own core competencies along the pharmaceutical value chain (Porter, 1985). Supporting Powell (1996), the cases (see Table 5) show that biotech companies are characterized by an entrepreneurial spirit, a risk-taking attitude, a flat organizational hierarchy, and innovative capabilities that make them stars in the field of research. Pharmaceutical companies acquire biotech know-how and technologies to support their own growth strategies (Proposition 1b). The acquirers thus need to protect the acquired firms' competencies by applying a slow preservation approach (Proposition 2), and granting the acquired biotech companies a high degree of autonomy (Datta & Grant, 1990), because core competencies are superior in use, hard to imitate, difficult to substitute for, and more valuable within their original firms than outside them (Barney, 1991). Therefore, there were no transfers of biotech know-how from the biotech to the pharmaceutical firms (Proposition 3), but only transfers of biotech knowledge.

By contrast, clinical trials, regulatory affairs, and sales and marketing are the core competencies of pharmaceutical companies. They acquired the biotech companies with the short-term motives of filling up their R&D pipelines and gaining access to potential blockbuster drugs (Proposition 1a). Thus, the right organizational integration approach for these areas is rapid absorption, whereby the pharmaceutical company takes over control. In order to realize this, the pharmaceutical companies need to receive the necessary biotech knowledge (Proposition 3) to bring the biotechs' drugs to market. Furthermore, the supporting functions (finance, human resources, IT) were carried out by the pharmaceutical companies because they usually had more elaborate systems (Proposition 2). As a result, on the upper side of the "integration box" (Figure 1), there is the degree of autonomy granted to the biotech firm, whereas on the lower side the degree of control of the pharmaceutical company is determined. The determination of the border between these two areas depends on the perceived core competencies the acquired biotech company has with regard to the competencies of the pharmaceutical company.

In respect of the existing postacquisition integration literature, the work of Haspeslagh and Jemison (1991) is the most prominent. They developed a capabilities-based framework that identifies three primary integration approaches: preservation, absorption, and symbiosis. In this context, the symbiotic strategy might be of interest as symbiotic acquisitions reflect high interdependence and at the same time a high need for organizational autonomy. However, to accomplish symbiosis, Haspeslagh and Jemison (1991) suggest, there needs to be a period of initial preservation where members of both firms first coexist and learn from each other before making the strategic changes necessary to slowly and gradually amalgamate the two firms. Comparing this strategy with my case findings, it becomes obvious that it would not explain pharmaceutical-biotech acquisitions, because pharmaceutical companies need to apply two different kinds of integration strategies (preservation *and* absorption) at different paces (slow *and* fast) at the same time (Proposition 2) to integrate acquired biotech companies and to realize the short-term and long-term motives connected with acquisitions (Propositions

1a and 1b). Moreover, such integration is characterized by a hybrid knowledge transfer perspective (Ranft & Lord, 2002) requiring differentiation between biotech knowledge and biotech know-how (Proposition 3), part of which needs to be kept and protected within the biotech companies (preservation), and part of which needs to be transferred to the pharmaceutical company (absorption). Hence, this study extends the existing postacquisition integration literature by adding a temporal perspective, whereby slow and fast integration steps[3] are simultaneously combined in the hybrid model, given a hybrid knowledge and know-how transfer perspective.

Moreover, this paper addresses the issue of the speed at which M&A integrations ought to take place, a matter to which researchers have so far paid little attention (Schweiger & Walsh, 1990). The existing debate (Ashkenas, DeMonaco, & Francis, 1998; Buono & Bowditch, 1989; Haspeslagh & Jemison, 1991; Kitching, 1967) is only as to whether integration ought to be quick or slow; researchers have not previously considered a potential combination of different paces of integration. This provides another interesting field for further research.

The concept of "complementary assets" (Arora & Gambardella, 1990; Teece, 1986; Tripsas, 1997) supports the need for a hybrid postacquisition integration approach. The aim of bringing a drug to market not only requires know-how in biotech research, but also requires the complementary assets of knowledge acquired in clinical trials, regulatory approval, and a worldwide sales and marketing organization. This view is also in line with Williamson's (1975) suggestion that smaller, entrepreneurial firms are more efficient at developing innovation, but less efficient in the production and distribution of new products. Moreover, Rothaermel (2001) found that incumbents that focus on exploiting complementary assets—that is, on using the technological expertise of new entrants—outperform incumbents that focus on exploring new technology: that is, trying to gain new know-how (Cohen & Levinthal, 1990). Highly specific know-how like that in the biotech context (Powell, 1993) is harder to transmit because fewer parties other than the innovator can benefit from its application (Henderson & Cockburn, 1994; McEvily & Chakravarthy, 2002). This explains why there is no transfer of biotech know-how, but only a transfer of biotech knowledge from the biotech to the pharmaceutical companies (Proposition 3). Thus, pharmaceutical companies use the technological expertise and know-how of acquired biotech companies to generate promising drug candidates instead of trying to learn, understand, and apply the biotechs' know-how by aiming at leveraging their own research capabilities. This is also the major reason why some projects at the pharmaceutical companies studied here were stopped and transferred to the biotech firms. Moreover, the biotechs' retention of specific know-how explains why they become centers of excellence (Proposition 4).

The hybrid postacquisition integration approach is also chosen because of cultural differences. After acquisition, a biotech company is no longer a small, dynamic, "high-flex" Silicon Valley–type company (Teece, 2000) because it has become part of the structure of a large, multiproduct, integrated, hierarchical pharmaceutical company. Acquisition initiates a change in culture as well as in the determinants of the rate and direction of firm-level innovation (Proposition 5). Therefore, pharmaceutical companies try to grant acquired biotech firms a high degree of autonomy in order to preserve their specific organizational characteristics, as these are part of and preconditions for the capabilities of the biotech firms (Barney, 1986, 1991). Hence, the acquirers try to set structures in place that grant the biotech companies a high degree of autonomy, so that they become independent centers of excellence (Bartlett & Ghoshal, 1990; Gerybadze & Reger, 1999; Kuemmerle, 1997) within the structures of the pharmaceutical companies (Propositions 4, 5) while at the same time integrating those value chain activities that do not depend on the biotech culture and know-how (Proposition 2). This view is in line with Shrallow (1985) and Yunker (1983), who argued for as much autonomy for acquired organizations as possible because they may otherwise lose the qualities that made them interesting to the acquirers in the first place. As a result, the autonomy and the relative standing of an acquired biotech company and its employees increase, and the tendency of valuable R&D employees to leave is minimized (Ranft & Lord, 2000). Given the specific complementary resource perspective, the biotech know-how of R&D people may be more critical for the success of an acquisition than the retention of the top managers that is primarily analyzed by existing research (Hambrick & Canella, 1993; Very et al., 1997; Walsh, 1989). After an acquisition, the ultimate focus is no longer on bringing a drug to market, but on producing innovative research results that are useful for further development at the pharmaceutical company, thus making valuable R&D employees indispensable. An interesting field

[3] The author would like to thank an anonymous reviewer for this suggestion.

for future research might therefore be the question of how the standing of R&D employees in a biotech firm changes after its acquisition by a pharmaceutical company.

Furthermore, this study extends the perception of culture, because I consider culture not only as a precondition to avoiding integration problems (Buono & Bowditch, 1989; Cartwright & Cooper, 1992; Weber, 1996), but also as actually an inherent part of the capabilities of biotech companies (Barney, 1986). In order to preserve the biotech culture with its specific attributes (Powell, 1996), the acquired biotech companies become independent centers of excellence (Propositions 4, 5). Additionally, this study shows that organizational culture differences may be even more important than national culture differences (Larsson & Lubatkin, 2001; Very et al., 1997). Being part of a pharmaceutical company alters the culture of a biotech company; thus, another interesting future research area might be to analyze how long and by what means the biotech culture can best be preserved within centers of excellence.

The developed framework suggests that the more a postacquisition integration follows the steps of the framework depicted in Figure 1, the more successful an acquisition will be (Proposition 6). This conclusion is to a considerable extent in line with the observations made in each particular case. However, further research needs to be done to analyze the generalizability of these propositions beyond the context of this study. Future research on the measurement of performance is not without challenges, especially since the issue of defining and measuring acquisition success has not yet been addressed in a fully satisfactory manner (Javidan et al., 2004). Moreover, much of this data needs to be obtained via primary data sources, and scales as well as survey items must be developed and validated. The cases also indicate that postacquisition integration can be a very long process and can be affected by key managerial decisions on the speed and extent of the integration of an acquired company. Thus, future research should explore how these decisions are made and how they influence acquisition performance.

## CONCLUSION

This study addresses the fundamental problem of acquiring companies' finding optimal integration strategies at the same time that they gain access to specific know-how via acquisitions. Findings show a clear need to go beyond single-stage integration approaches if the complex variety found in M&As is to be captured. Like Greenwood, Hinings, and Brown's (1994) work, the current study makes a unique contribution to the literature, as it addresses the call for a more detailed and differentiated analysis of the complex variability found in M&As (Bower, 2001; Pablo & Javidan, 2004). This article links the different motives (Propositions 1a, 1b) for acquisition with different postacquisition integration approaches (Proposition 2) to the specific relationships between pharmaceutical and biotech companies. It describes a hybrid postacquisition integration approach (Figure 1) that simultaneously combines rapid and slow integration with different degrees of integration to successfully integrate an acquired biotech company (Proposition 6). In order to realize the short-term and long-term motives linked with acquisition (Propositions 1a, 1b), it is necessary to focus on the rapid integration of all non-R&D-related portions of an acquired business, while the R&D-related portion retains a high degree of autonomy (Proposition 2) that protects specific biotech know-how (Propositions 3, 4) and designates the specific biotech culture as a capability worth preserving (Propositions 4, 5).

The generalizability of the propositions is limited by the relatively small size and scope of the sample. Larger-scale empirical efforts are necessary to statistically assess the relationships presented here and to help define the contexts in which these relationships vary. Moreover, given the complexity of M&As, the results of this study may clearly vary across different industries with different attributes and characteristics and across different types of M&As. Future research should focus on how hybrid organizational integration approaches are put in place in different industries and different types of acquisition pursuing different motives. Recent studies (e.g., Kale, Dyer, & Singh, 2002; Larsson & Finkelstein, 1999) have combined qualitative and quantitative methods drawing on qualitative field work, survey data, and secondary data in order to gain a richer understanding of complex phenomena. In addition, the process of due diligence may be one issue worth further investigation as it is difficult for an acquiring company to evaluate a patent or technology when it lacks in-depth understanding.

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