

**STRATEGIC ALLIANCES IN PHARMACEUTICAL DRUG
DEVELOPMENT : A CASE STUDY OF THREE STRATEGIC
ALLIANCES AT ELI LILLY AND COMPANY //**

By: Catherine Wangui Wachira

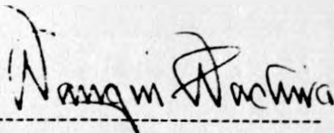
**A Management research project submitted in partial fulfillment of
the requirements for the degree of Masters of Business
Administration,
Faculty of Commerce,**

University of Nairobi.

August 2002

Declaration

This project is my own original work and has never been submitted or presented for a degree in any other University.

Signed: -----

Catherine Wangui Wachira

Date: OCTOBER 27th 2003

This project has been submitted for examination with my approval as a University supervisor.

Signed: -----

Professor Bing-Sheng Teng
Department of Strategic Management
and Public Policy.
School of Business and Public Management
The George Washington University
2115 G Street, N.W. Washington, DC 20052

Date: 10/29/03

Dedication

**To my mother, father, sister, brothers and Sylvain Ogier and to the wonderful memory of
Dr. Dan Yoga, Dr. Daniel Asiko, Ms. Florence Itubo and Dr. Edward Ayoo.**

Acknowledgements

This project has been accomplished with the encouragement, support and contribution from a number of people to whom I am deeply indebted.

First I would like to give my special thanks to my supervisor Professor Bing-Sheng Teng of The George Washington University, whose focused and insightful guidance enabled me to complete this project.

I would also like to thank all my lecturers at the University of Nairobi, it was a great privilege to be taught by you, your unceasing support and encouragement enabled me to overcome the challenge of completing my studies in the United States of America.

My sincere appreciation also goes to my family, my friend Nyakiringa Marcos and all my relatives and friends whose prayers and wishes of goodwill encouraged me to complete the programme.

I would also like to thank Mr. Anton Gueth, Ms. Carol Stephenson, Ms. Sally Marie Davis, Mr. Frank Pruce and all their colleagues at Eli Lilly and Company in Indianapolis, Indiana, USA who took time off their busy schedules to discuss with me intricate aspects of their firm's alliances.

Last but not least, I am thankful to the Almighty God.

TABLE OF CONTENTS

Chapter		Page
<i>Declaration</i>		<i>i</i>
<i>Dedication</i>		<i>ii</i>
<i>Acknowledgements</i>		<i>iii</i>
<i>Table of Contents</i>		<i>iv</i>
<i>List of Tables and Figures</i>		<i>vii</i>
<i>List of Acronyms and Abbreviations</i>		<i>viii</i>
<i>Abstract</i>		<i>x</i>
Chapter One		
1.0	Introduction	1
1.1	Background	1
1.2	About Eli Lilly and Company	3
1.3	The Research Problem	6
	1.3.1 Objectives of the Study	10
	1.3.2 Importance of the Study	11
1.4	Structure of the Research Paper	12
Chapter Two		14
2.0	Literature Review	14
2.1	Uncertainty and Alliances	14
2.2	Prevalence of Strategic Alliances in the Pharmaceutical and Biotechnology Industry	15
2.3	Importance of Having an Alliance Strategy	20

2.4	Relationship Risk in Alliances	23
Chapter Three		26
3.0	Research Methodology	26
3.1	Research Design	27
3.2	Unit of Analysis	27
3.3	Data Collection	27
3.4	Data Analysis	28
3.5	Validity of Research Methodology	29
Chapter Four		31
4.0	Results and Discussion	31
4.1	Overview	31
4.2	Alkermes Incorporated-Eli Lilly and Company Alliance	33
	4.2.1 Adding Value to Both Companies	39
4.3	Ranbaxy Laboratories Ltd-Eli Lilly and Company Alliance	41
4.4	Takeda Pharmaceuticals North America-Eli Lilly and Company Alliance	43
	4.4.1 Adding Value to Both Companies	46
Chapter Five		48
5.0	Further Discussion	48
5.1	Further Discussion and Cross Case Analysis	48

5.1.1	Alkermes Incorporated-Eli Lilly and Company Alliance	48
5.1.2	Takeda Pharmaceuticals North America-Eli Lilly and Company Alliance	51
5.1.3	Ranbaxy Laboratories Ltd.-Eli Lilly and Company Alliance	52
5.2	Limitations of the Study	53
5.3	Conclusions	54
5.4	Recommendations for Further Research	56
	References	57
	Appendices:	62
1.	Letter of Introduction	
2.	Structured Questionnaire	

List of Tables and Figures

Page

Table 1: Pharmaceutical and Biotech firms most active in Strategic Alliances 1973-2001 16

Figure 1: Strategic Alliances among the top 12 Pharmaceutical and top 12 Biotech firms 17

Figure 2: Networks in Recombinant capital database of Pharmaceutical-Biotech Alliances 18

List of Acronyms and Abbreviations

FDA	Food and Drug Administration
ADA	American Diabetes Association
NDA	New Drug Application
IND	Investigation New Drug
Lilly	Eli Lilly and Company
Takeda	Takeda Pharmaceuticals North America
Alkermes	Alkermes Incorporated
Ranbaxy	Ranbaxy Laboratories Ltd.
IMS	International Medical Services Health Data
ICH	International Center on Harmonization
GCP	Good Clinical Practice
GMP	Good Manufacturing Practice
CFR	Code of Federal Regulations
DNA	Deoxyribonucleic Acid
IGH	Inhaled Growth Hormone
Phase I	Pharmacodynamic/Pharmacokinetic studies done in healthy volunteers to determine drug dose.
Phase II	Studies done to determine safety of the drug
Phase III	Studies done to determine both efficacy and safety of the drug
R&D	Research and Development
WTO	World Trade Organization
OAM	Office of Alliance Management

- LAMP** **Lilly Alliance Management Process**
- NIH** **National Institutes of Health**
- TRIPS** **Agreement on Trade Related Aspects of Intellectual Property Rights.**

Abstract

This study sought to determine the critical factors that led to varying outcomes in three strategic alliances at Eli Lilly and Company. The primary objective of the study was to determine what influence if any, did each partner's strategic intent, key strengths and the financial contribution of each alliance partner have on the eventual outcome of the alliance. The study was based on primary data which was collected using a questionnaire.

Data was obtained on one research and development alliance and two commercialization alliance at Eli Lilly and Company. The findings of this study reveal a relationship between each partner's strategic intent, strengths and the eventual posture and hence the outcome of the given alliance.

Limitations of the study include the fact that only one research and development alliance was examined and no manufacturing alliance was examined.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

The pharmaceutical industry's present situation is characterized by ever increasing complexity of science and technology, as a result of which the industry is tackling significant rises in research and development costs (Drug Topics, 1991).

The estimated cost of getting a drug to the market has steadily risen from \$ 55 million in the late 1970's to over \$ 500 million in the late 1990's. This includes not only the compounds that are finally approved by the Food and Drug Administration (FDA) for market but also the ones that do not complete the drug development process successfully (IMS Data Pink Sheet 2002).

Only five in five thousand compounds that enter pre-clinical testing make it to human testing and just one of those five will be approved by the FDA according to the Pharmaceutical Manufacturers Association, on average this is a twelve year process.

The "One billion dollars in sales within the first year of launch" pharmaceutical concept has invariably evolved to cater for the combination of all the risk factors that are an intrinsic part of clinical drug development, pharmaceutical companies are under great pressure to recoup their investment of time and money in the R&D process as soon as a drug is launched.

2001, only 24 New Drug Applications (NDAs) were filed with the FDA, a greater number of which were not new entities but enhancements to already existing products. This first half of the 2002 saw only two NDAs filed with the FDA which is clearly not sufficient to keep the major drug companies in business if this trend continues.

Definition of Terms

The term alliance is defined by Spekman, Isabella and MacAvoy (2000) as a close, collaborative relationship between two or more firms with the intent of accomplishing mutually compatible goals that would be difficult for each to accomplish alone.

Collaborative implies that a set of operating norms exists among partners such that each partner will not act in self-interest to the detriment of the other. Implied here also are the notions of voluntary involvement rather than coercion, and the expectation of reciprocal behavior.

Mutually compatible suggests that there is an alignment among partners, such that each can still accomplish its objectives within the framework of the alliance

Difficult to achieve alone without collaborative effort recognizes that each partner is not only dependent on the other but acknowledges that their individual fates are

linked. Each admits for example that costs are prohibitive, time too precious, expertise too limited or management of time and other resources too scarce to attempt to achieve the goals of the alliance without the partner.

Companies entering an alliance usually do not think about relationship issues first. They typically focus on their explicit goals for the alliance (Pharmaceutical Technology October 2001).

1.2 About Eli Lilly and Company

Eli Lilly and Company is a global research-based pharmaceutical corporation dedicated to developing and acquiring innovative pharmaceutical-based health care solutions that enable people to live longer, healthier and more active lives.

Lilly has three main types of alliances:

- Research and Development Alliances
- Commercial Alliances
- Manufacturing Alliances

Lilly is committed to establishing relationships with third parties that supplement and enhance its internal capabilities and create similar benefits for their partners.

The value Lilly brings to the R&D partnership is discovery research, process development and manufacturing, global clinical development and global regulatory expertise.

The R&D efforts are focused on five therapeutic areas:

- Cancer
- Cardiovascular Diseases
- Endocrinology
- Infectious Diseases
- Neuroscience

Lilly brings distinct value in late stage development or commercialization partnerships they form: process development and manufacturing, large scale global clinical trial management, global regulatory expertise, seasoned submission by a coordination team with a track record of success, established relationships with makers of alternative delivery systems, large well trained sales forces, presence in all major markets around the world and strong managed care relationships in North America.

Over one hundred manufacturing alliances in more than 40 countries worldwide play a significant role in Lilly's global supply chain. With a strategy of "manufacturing without walls" Lilly seeks to generate opportunities for large numbers of partners through its global market reach, quality control and quality assurance expertise, technical service and development support on site and global regulatory expertise.

Lilly and Company decided to expand its drug development by entering into strategic alliances with other, usually smaller, biotechnology firms, the company committed to becoming the "premier partner" in the pharmaceutical industry (Journal of Commercial Biotechnology, Vol. 8, 2001)

An FDA inspection of four Lilly manufacturing facilities in Indianapolis during November 2001 resulted in fifty new GMP violations in addition to those detected at a previous inspection. On the earlier occasion, the FDA issued a Warning Letter and ordered a temporary shut down while corrections were being made, the reinspection, jeopardized the firm's ability to maintain adequate supplies of its products in the global market (Medical Marketing and Media, February 2002). Bearing in mind the above and the fact that Lilly had just lost the company's secondary patent for its blockbuster antidepressant Prozac™, which accounted for global sales of \$ 2.6 billion, twenty-six of Lilly's revenue, clearly put even more pressure on the firm to succeed in its collaborative drug development partnerships (Pharmaceutical Executive ; September 2000; Davis Smith; Kevin Gopal).

In 1998 Lilly increased the R&D budget about thirty percent to more than \$ 2.2 billion, hired seven hundred scientists and in search for the next blockbuster, ordered Lilly's now six thousand nine hundred researchers not to bother with any drug unlikely to top \$ 500 million in annual sales. The payoff is that now Lilly has a medicine cabinet stocked full of promising new drugs, including treatments for schizophrenia and for sepsis, a potentially fatal of bacterial infection.

1.3 The Research Problem

According to Benjamin Gomes-Casseres (1998) alliances formed at high levels and often blessed with the designation "strategic" or "corporate" often fail to deliver real benefits to the partners. Analysts and managers will argue eternally

An FDA inspection of four Lilly manufacturing facilities in Indianapolis during November 2001 resulted in fifty new GMP violations in addition to those detected at a previous inspection. On the earlier occasion, the FDA issued a Warning Letter and ordered a temporary shut down while corrections were being made, the reinspection, jeopardized the firm's ability to maintain adequate supplies of its products in the global market (Medical Marketing and Media, February 2002). Bearing in mind the above and the fact that Lilly had just lost the company's secondary patent for its blockbuster antidepressant Prozac™, which accounted for global sales of \$ 2.6 billion, twenty-six of Lilly's revenue, clearly put even more pressure on the firm to succeed in its collaborative drug development partnerships (Pharmaceutical Executive ; September 2000: Davis Smith; Kevin Gopal).

In 1998 Lilly increased the R&D budget about thirty percent to more than \$ 2.2 billion, hired seven hundred scientists and in search for the next blockbuster, ordered Lilly's now six thousand nine hundred researchers not to bother with any drug unlikely to top \$ 500 million in annual sales. The payoff is that now Lilly has a medicine cabinet stocked full of promising new drugs, including treatments for schizophrenia and for sepsis, a potentially fatal of bacterial infection.

1.3 The Research Problem

According to Benjamin Gomes-Casseres (1998) alliances formed at high levels and often blessed with the designation "strategic" or "corporate" often fail to deliver real benefits to the partners. Analysts and managers will argue eternally

Spekman, Isabella and MacAvoy(2000) state that licensing which is one of the levels of an alliance, is used to provide pipeline protection for the companies by relying on others to provide key innovations. The knowledge transfer is explicit and can easily be circumscribed to a defined set of compounds, drugs or process. For the smaller firm, the license provides much needed cash and most importantly, protects their intellectual core from expropriation of tacit knowledge and proprietary technology.

Lynch Robert(1993) identified a number of conditions that trigger the formation of an alliances between firms which include:

- When a company is ready to penetrate a foreign market more fully but lacks the management resources, capital or product-line to start an overseas company.
- When overseas competitors are positioning themselves to capture a greater market share
- As a preemptive move to keep a foreign competitor tied up in its home turf, so that it cannot move into the domestic market.
- To create a permanent distribution channel without expending exorbitant amounts of cash.
- When a foreign government's policies prohibit control of their domestic corporations and a local content is required to hold market share.

- To establish an offshore production site to offset cost of shipping, currency fluctuations or to become closer to the sources of material supply.

The pharmaceutical industry is clearly a research and development driven industry. Survival is based on a firm's ability to successfully bring to market new, safer and more effective drug compounds. When pharmaceutical companies form alliances with other pharmaceutical or technology firms, they are able to access technology or drug molecules that they do not have in their pipeline, faster and more cost efficiently.

No study to my knowledge has been done which specifically examines three alliances within a large pharmaceutical company with the distinct objective of determining why these alliances may have had varying outcomes.

It is against this background that I chose to closely examine three alliances that a large global pharmaceutical company in North America had formed with other pharmaceutical and biotechnology firms. Several questions arose and by examining these alliances closely, I sought to determine:

Why had these alliances varying outcomes?

What influence if any did each partner's strategic intents, strengths and leadership have on the eventual outcome of the alliance?

How did changing partner needs and possible conflicts of interest if any, influence the eventual outcome of the alliance?

1.3.1 Objectives of the Study

This study seeks to:

- a) Determine what influence if any, did each partner's strategic intent, key strengths and the financial contribution of the alliance to each partner, have on the eventual outcome of the alliance.
- b) Determine if these three factors complemented each other at the alliance contact point, during the alliance process and how they may have contributed to the eventual outcome of the alliance.
- c) Determine if the changing needs or interests of the partners could have contributed to the eventual outcome of the alliance.
- d) Determine if the external conditions could have contributed to the eventual outcome of the alliance.

1.3.2 Importance of the Study

- a) The study seeks to determine whether complementary strategic intent, complementary partner strengths and the possibility of a financial contribution to the alliance partners may have influenced the alliance outcome.
- b) This may enhance a better understanding of both the internal and external operating environments that may have contributed to these differing results.
- c) The study is also expected to assist learning institutions in drawing attention to vital lessons learned on examining alliances that have varying outcomes, yet whose critical success factors may have been similar.
- d) This study is also expected to stimulate interest among academicians and encourage further research in strategic alliances within the pharmaceutical industry and hence provide a link between theory and practice.
- e) This study is also aimed at sensitizing Alliance Managers on the need to be actively involved in the evolution of their alliances.

1.4 Structure of the Research Paper

The paper will have five chapters whose contents are outlined below:

Chapter One Introduction

This chapter will contain the introduction, statement of the research problem, the objectives of the study and the importance of the study

Chapter Two Literature Review

This chapter will cover the literature review examining several studies that have been carried out with alliances in the pharmaceutical and biotechnology industries.

Chapter Three Research Methodology

This chapter will cover all aspects of the research design, the unit of analysis, data collection methods, data analysis and the validity of the research methodology.

Chapter Four Results of the Study

This chapter will contain the study results and research findings.

Chapter Five Discussions, Summary and Conclusions

This chapter will cover the synthesis of research findings, discussion of these

results, a further a discussion, which includes a cross case analysis, limitations of the study, conclusions and recommendations for further research.

4.2.1.1. Introduction

The first part of the chapter introduces the research objectives and the research questions. It also provides a brief overview of the research methodology and the data collection process.

The second part of the chapter discusses the results of the research. It starts with a description of the data and then moves on to a detailed analysis of the findings. The analysis is organized into several sections, each focusing on a different aspect of the research. The first section discusses the overall trends in the data, while the subsequent sections focus on specific variables and their relationships. The final section of the analysis discusses the implications of the findings for practice and policy.

The third part of the chapter discusses the conclusions and recommendations for further research. It starts with a summary of the main findings and then discusses the implications of these findings for practice and policy. The final section of the chapter discusses the limitations of the study and provides recommendations for future research.

CHAPTER TWO

2.0 LITERATURE REVIEW

Previous studies of alliances within the biotechnology and pharmaceutical industries have been surveys, seeking to reach a consensus on various contemporary issues that are unique to pharmaceutical drug development and marketing.

2.1 Uncertainty and Alliances

When a drug delivery company and a major pharmaceutical company begin thinking about entering into an alliance, their major concern is usually whether such an arrangement makes good technical and business sense. For instance, is there a good technical match between what the technical delivery company has and the molecule that the pharmaceutical company owns? Is the alliance the best way for both companies to create shareholder value and recoup the investment each has made in their technologies? (Pharmaceutical Technology October 2001).

Rumelt, Schendel and Teece (1994) suggested that an alternative to vertical or lateral integration that is sometimes favoured is the "strategic alliance" possibly in the form of a joint venture. Viewed in transaction cost economics terms, the joint venture should be regarded as an effective alternative to integration. Instead what mainly recommends the joint venture is that it supports quick responsiveness. So regarded, it should be considered as a temporary form of organization.

2.2 Prevalence of Strategic Alliances in the Pharmaceutical and Biotechnology Industry

Recombinant Capital's database of strategic alliances among pharmaceutical and biotechnology firms clearly established evidence of not only the wide occurrence of these relationships and networks in pharma-biotech alliances but also the rich variety of governance structures and organizational objectives within these alliances.

Table 1

Pharmaceutical and Biotech Firms Most Active in Strategic Alliances, 1973-2001

<i>Panel A</i> <i>Top 12 Pharmaceutical Firms</i>		Number of Alliances	Number of Partners	Pharma Partners	Biotech Partners	Partners in Top 24
1	GlaxoSmithKline (GSK)	373	248	11.7%	58.5%	20
2	Pharmacia (PHA)	370	271	12.2%	44.1%	21
3	Pfizer (PFE)	287	194	14.4%	57.7%	19
4	Novartis (NVS)	230	167	16.2%	54.5%	18
5	Elan (ELN)	228	153	22.2%	38.6%	14
6	Hoffmann-La Roche (HLR) ^a	224	164	11.7%	62.0%	17
7	Johnson & Johnson (JNJ)	212	170	16.5%	37.6%	16
8	Abbott (ABT)	201	174	13.3%	49.7%	14
9	American Home Products (AHP)	175	124	21.0%	56.5%	19
10	Lilly (LLY)	164	132	13.6%	62.9%	16
11	Merck (MRK)	164	118	16.1%	58.5%	16
12	Bristol-Myers Squibb (BMY)	150	128	10.9%	57.8%	15

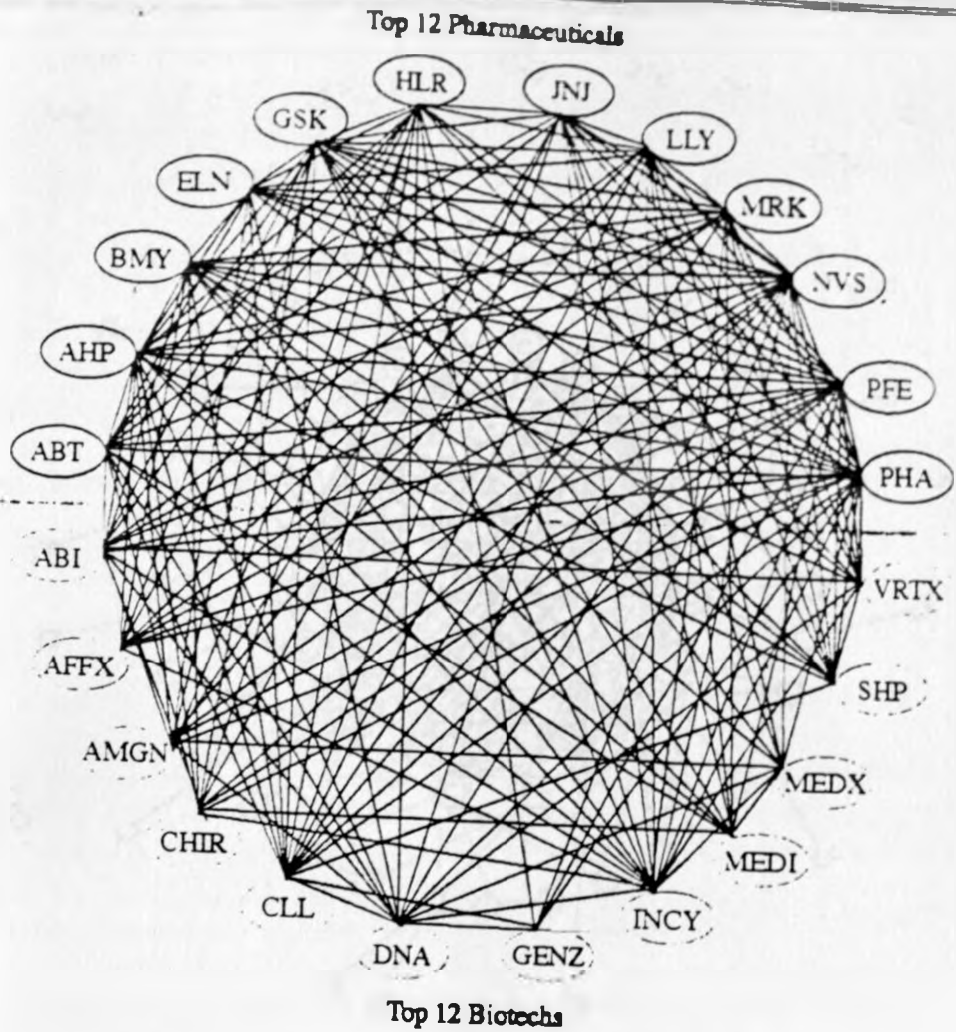
<i>Panel B</i> <i>Top 12 Biotech Firms</i>		Number of Alliances	Number of Partners	Pharma Partners	Biotech Partners	Partners in Top 24
1.	Applera (ABI)	214	183	13.7%	38.3%	15
2.	Chiron (CHIR)	172	136	20.0%	31.1%	12
3.	Genentech (DNA)	124	92	14.1%	54.3%	14
4.	Genzyme (GENZ)	122	102	14.7%	32.4%	6
5.	Shire Pharmaceuticals (SHP)	119	85	24.7%	36.5%	12
6.	Incyte Genomics (INCY)	107	90	25.8%	42.7%	17
7.	Celltech (CLL)	106	89	25.8%	37.1%	15
8.	Affymetrix (AFFX)	91	69	26.1%	30.4%	10
9.	Medarex (MEDX)	88	73	16.4%	41.1%	10
10.	Medimmune (MEDI)	86	67	22.4%	25.4%	10
11.	Vertex (VRTX)	79	63	25.8%	32.3%	12
12.	Amgen (AMGN)	78	66	21.2%	42.4%	12

Note: Data extracted from Recombinant Capital database of alliances in the pharma-biotech industry, based on approximately 12,500 publicly disclosed contracts and arrangements. Companies ranked (and "top companies" defined) by number of alliances. The number of alliances reported excludes alliances with entities that ultimately became wholly owned subsidiaries of the companies in the table. Contracts are assigned to the surviving parent, regardless of whether the parent was involved in the original arrangement.

^aHoffmann-La Roche is a wholly owned subsidiary of privately held Roche Holdings.

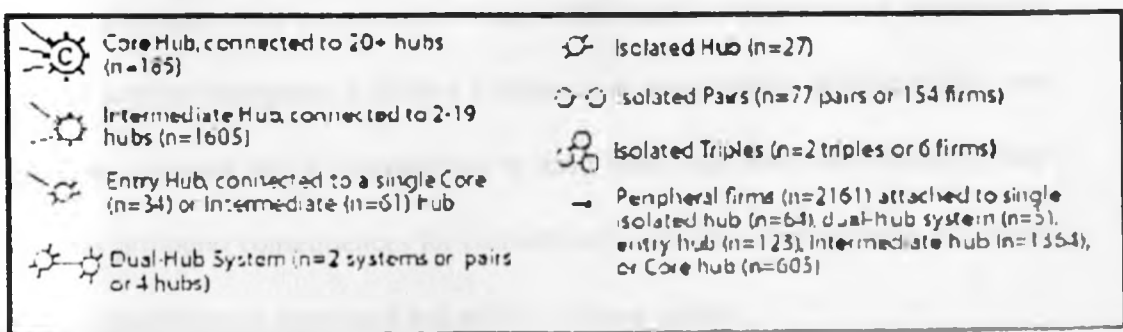
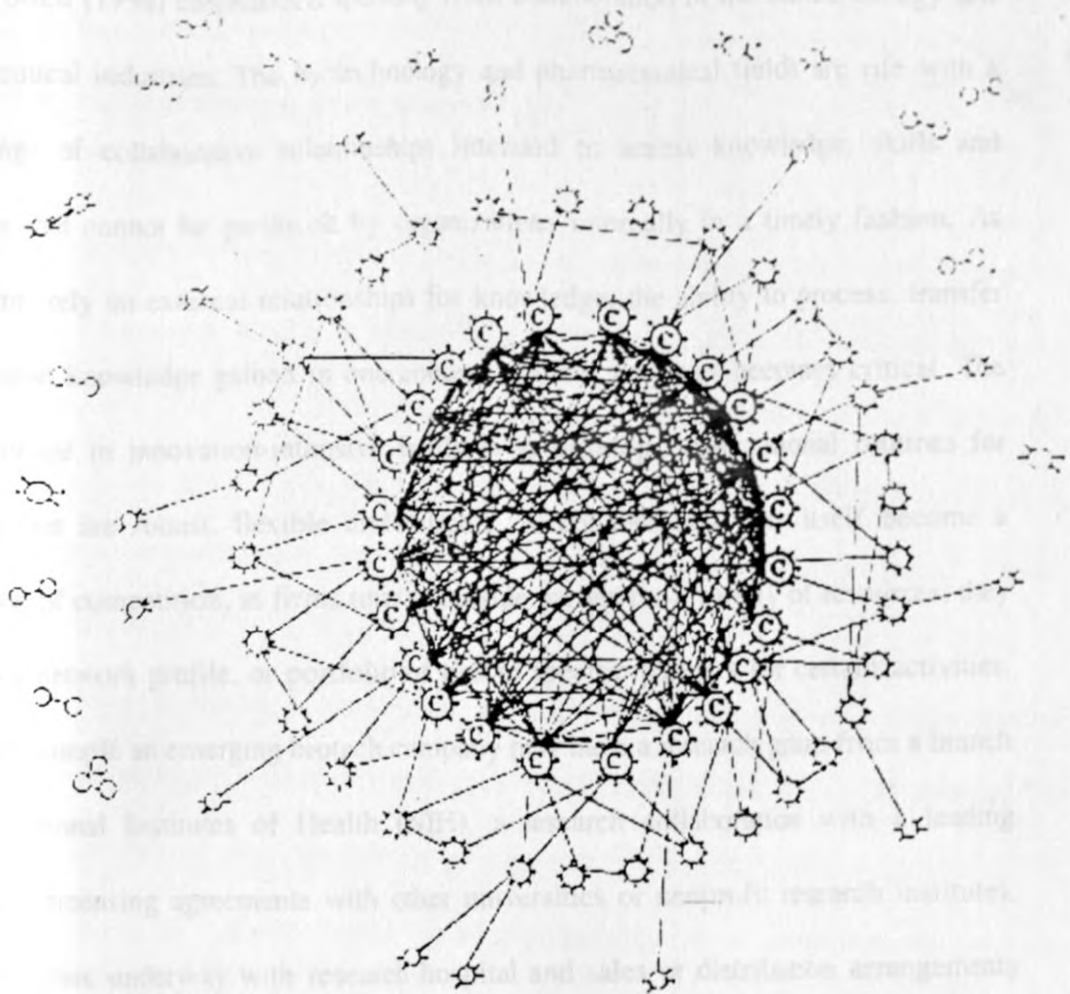
^bApplera, formed by the combination of Applied Biosystems and Celera Genomics, trades under two tracking stocks, ABI (Applera-Applied Biosystems) and CRA (Applera-Celera Genomics).

Figure 1 Strategic Alliances Among the Top 12 Pharmaceuticals and Top 12



Note: Ticker symbols correspond to companies included in Table 3. Data extracted from Recombinant Capital database of alliances in the pharma-biotech industry, based on approximately 12,500 publicly disclosed contracts and arrangements from 1973-2001. Contracts are assigned to the surviving parent as of year-end 2001, regardless of whether the parent was involved in the original arrangement.

Figure 2 Networks in Recombinant Capital Database of Pharmaceutical-Biotech



Note: Data extracted from Recombinant Capital database of alliances in the pharma-biotech industry, which includes 4,231 unique entities (surviving parents as of year-end 2001)

Walter Powell (1998) emphasized learning from collaboration in the biotechnology and pharmaceutical industries. The biotechnology and pharmaceutical fields are rife with a wide range of collaborative relationships intended to access knowledge, skills and resources that cannot be produced by organizations internally in a timely fashion. As more firms rely on external relationships for knowledge, the ability to process, transfer and transmit knowledge gained in one context to other activities becomes critical. The key challenge in innovation-intensive fields is to develop organizational routines for learning that are robust, flexible and durable. A collaboration may itself become a dimension of competition, as firms turn to outside parties for a variety of resources, they develop a network profile, or portfolio of ties to specific partners for certain activities. Thus for example an emerging biotech company may have a research grant from a branch of the National Institutes of Health (NIH), a research collaboration with a leading university, licensing agreements with other universities or nonprofit research institutes, clinical studies underway with research hospital and sales or distribution arrangements with a large pharmaceutical corporation. Analytically, each combination of partnership and business activity represents a distinct collaborative relationship. Whether firms are constrained to a narrow set of relationships or have broad options in determining their portfolios has profound consequences for competition, their choice of partners are fewer and thus the competition is increased, but within a narrow sphere.

Lilly, a big pharmaceutical player has both more focused and more extensive collaborations. Whilst pursuing a strategy of "discovery without walls" Lilly has several dozen research alliances with a wide variety of biotech firms, ranging from new startups to more established companies, in addition to those extensive external discovery efforts,

Lilly also has licensing and joint sales and distribution agreements with biotech firms, but the clear emphasis has been on the research side.

Hamilton Williams (1993) states that no single firm commands the full range of resources necessary to manage emerging technology in its early stages of development. Both established and emerging firms typically control essential assets but even the most successful firms must look for external sources to commercialize radically new technology. Companies that plan to participate in an emerging technology should anticipate and organize to manage the rapid shift in strategic emphasis over time. External alliances deserve careful consideration as mechanisms for managing discontinuous technological change. The brief history of biotechnology has been characterized by extensive network of alliances linking emerging technology firms with both established incumbents and new entrants. For the emerging firms, these collaborations not only provide the financing to support scientific research and organizational development, but also offer access to important complementary assets such as product design and marketing resources.

2.3 Importance of Having an Alliance Strategy

In an effort to determine if certain firms had distinct alliance strategies, Benjamin Gomes-Casseres (1998) also noted that alliance portfolios are important in industries driven by innovation. Alliances formed at high levels and often blessed with the designation “strategic” or “corporate” often fail to deliver real benefits to the partners. The creation of

big alliances came to be seen as an end in itself rather than a means towards a broader strategic goal and this lies partly in the tendency of the deal's champions and negotiators to see the alliances itself as a goal. Pharmaceutical companies for example are increasingly using multiple external alliances to complement their R&D. An alliance without a coherent strategy behind it is doomed to fail. He also emphasizes that an alliance strategy is more than a strategic alliance. A coherent alliance strategy has four elements:

- An underlying business strategy that shapes the logic and design of individual alliances.
- A dynamic view that guides the management and evolution of each alliance.
- A portfolio approach that enables coordination among alliances and enhances flexibility.
- An internal infrastructure that supports and strives to maximize the value of external collaborations.

Pharmaceutical companies may invest in several small biotech firms and fund several university laboratories, meanwhile doing internal research on related topics. The reason for such a fragmented approach is that the chance of success of any single project is low and unpredictable. The portfolio of alliances is a way to place multiple stakes and hope for a jackpot somewhere.

Dyer Jeffery, Kale Prashat, Singh Harbir (2001) in their extensive research of several companies across different industries showed that companies with a dedicated alliance function have been more successful than their counterparts at finding ways to solve problems regarding knowledge management, external visibility, internal coordination and

accountability. Although a dedicated alliance function can create value, success does not come without challenges.

Setting up such a function requires a serious investment of the company's resources and its people's time. Businesses must be large enough or enter into alliances to cover that investment.

Deciding where to locate the function in the organization and how to get line managers to appreciate the role of such a function and recognize its value can be difficult.

Establishing codified and consistent procedures may mean inappropriately emphasizing process over speed in decision making.

Challenges exist, however, the company that surmounts them and builds a successful dedicated strategic alliance function will reap substantial benefits.

Hamilton (1993) based his argument on positioning through strategic alliances on two principles: asset complementarity, the degree to which the assets of partners are complementary and hence reflect the potential offered by an alliance to broaden the asset base available to each partner and strategy complementarity, the degree to which the strategies of partners are complementary and hence reflects the potential offered by an alliance to support the partners' respective strategic thrusts. Changes in either or both these complementarities can have significant implication for the nature and role of strategic alliances in technological innovation.

2.4 Relationship Risks in Alliances

Benjamin Gomes-Casseres in the Financial Times of May 9, 2000 seeks to demonstrate the relationship of risks in alliances. He emphasizes that a poor structure or partner choice can doom an alliance. Management can ruin a promising relationship. It may be useful to recap how companies can manage risk in their alliances:

- Avoid “co-opetition”: the risk of conflict is high in alliances between rivals.
- Define the scope carefully: even among companies that are not direct rivals, good fences make good neighbours.
- Do not ignore governance: careful structuring of the alliance in advance of the deal and continual adjustment thereafter is key to building a constructive relationship.
- Build multiple bridges: enable relationships among partners to grow at many levels of their organizations.
- Do not trust: personal chemistry is good and needed, but it is no substitute for monitoring mechanisms, co-operations incentives and organizational alignment.
- Success begins at home: without a support system within your own organization, your external alliances are doomed to fail.
- Do not stare at the downside, watch for the upside: failed alliances do not achieve what they set out to do, but successful alliances achieve much more than their original goals planned for.

On examining the evolution of the drug industry, Starr Cynthia (1991) concluded that for a drug maker to remain competitive it must have a well-defined plan of action. This desire for survival is evident in the present wave of acquisitions, mergers and strategic alliances. The industry will shrink, not in terms of sales or in therapeutic output, but in terms of mass. Globally, forty to fifty drugs enter the market every year, they must carry a huge international industry that is investing billions of dollars in its R&D activities. This number of new drugs per year is not enough to keep ten to twenty drug firms afloat.

When Young (2002) studied mergers and acquisitions within the biotechnology industry, he noted that pharmaceutical companies recognized the value of genomics, bioinformatics and proteomics in the drug development process and are also using third party bioinformatic software and databases to accelerate drug target identification. Mergers and Acquisitions are a tool to build critical mass with product expansion while intellectual property disputes continue to obstruct progress in the industry.

Porter, Michael (1990) stated that companies enter alliances to gain a number of benefits, however, alliances carry substantial costs in strategic and organizational terms. The real problems of coordinating with an independent partner, who often has different and conflicting objectives, are just the start. Coordinating difficulties impede the ability to gain the benefits of a global strategy. Today's partner also often becomes tomorrow's competitor, especially partners with more robust competitive advantages or that are more dynamic. Alliances are frequently transitional devices, they proliferate in industries undergoing structural change or escalating competition, where managers fear that they cannot cope.

According to Wampler, Jon (1996) in his article *Strategic Alliances: An integrated health system alternative*, emphasized that there are definite risks in creating alliances and forming a strategic alliance is not a substitute for a coherent business strategy, in fact it is an effective means by which to execute that strategy.

No study to my knowledge has been done that specifically examines three comparable strategic alliances within a top pharmaceutical company with the distinct objective of determining why these alliances had varying outcomes.

It is against this background that I have chosen to examine three strategic alliances within Eli Lilly and Company with the distinct objective of determining why these well-orchestrated, clearly defined alliances had varying outcomes. Clearly, not every alliances meets the initial objectives that it was set to achieve. With the understanding that objectives are dynamic throughout the duration of a collaboration, one may have more to learn from an alliance that failed to meet it's initial objectives, as compared to one which was deemed as a success. Talking about failures, shortcomings and rough spots in a relationship would be equally as valuable as discussions of success and lessons learned. It has been acknowledged that an enormous amount of information and knowledge resides in the minds and electronic mail of key people within organizations who work within these collaborations.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter outlines the steps undertaken in executing the study. The specific methods and procedures used in the collection, measurement and analysis of data are also described.

3.1 Research Design

An explanatory research study was undertaken and it was aimed at determining why the three alliances Eli Lilly and Company (Lilly) had forged with outside partners and had varying outcomes. A multiple case study research design was used.

The decision to do a multiple case study of alliances at Lilly, was made after carefully studying of primary research of experts in the field of pharmaceutical drug development reported in highly upheld industry journals and books. Together with the theories and opinions of these experts, which led the researcher to the realization that this would only further enrich the primary data obtained on my interviewing several key personnel at Lilly and it's strategic partners (Hubbuch, Susan M. 1987).

3.2 Unit of Analysis

The units of analysis were three alliances, the following alliances were examined very closely:

- a) Alkermes Incorporated (Alkermes) - Eli Lilly and Company Alliance.
- b) Takeda Pharmaceutical North America (Takeda)-Eli Lilly and Company Alliance.
- c) Ranbaxy Laboratories Ltd. (Ranbaxy)-Eli Lilly and Company Alliance.

3.3 Data Collection

Primary data was used in this research, by conducting in-depth interviews with senior executives of Eli Lilly and Company and its partners. Most of the interviewees had personally participated in the initial negotiations for an alliance or been involved in the alliance in its early stages. The data was collected using a questionnaire that had both structured and unstructured questions. To assure the accuracy of the interview data I reviewed the interview notes with the interviewees. These interviews were conducted in the eight- week period of June and July 2002. Each interview lasted an average of one hour and each interviewee was interviewed more than once. In line with corporate executive interviewing protocol, I availed the investigative questions to the interviewees two weeks before the tentative interview, to seek corporate communications approval. A sample of the investigative questionnaire is presented in

the appendix. To assure the accuracy of the interview data, I conducted checks in which each interviewee verified my interview notes.

I also collected archival data for each partnership including pertinent details on the alliance contracts if possible, corporate brochures, annual reports, published case descriptions and news reports about these partnerships.

Sources of Interview Data

Director, Office of Alliance Management, Eli Lilly and Company.

Co-Founder, Director, Office of Alliance Management, Eli Lilly and Company.

Two Alliance Managers, Eli Lilly and Company.

Business Development Manager, Alkermes Incorporated.

Analyst, Venturi Technology Partners.

Managing Director, J P Morgan .

3.4 Data Analysis

The method adopted in analyzing the cases is analytical induction, data collected was examined and categorized and even recombined to address the initial propositions of the study. In contrast to enumerative induction, which relies on statistical methods to generate simple, aggregate and stable mental rules, analytical induction enabled me to extend and refine existing theory on alliances by comparing them with the cases I examined.

Pattern matching logic was also used to analyze the data collected. As this is an explanatory study, the patterns may be related to the dependent or independent variables of the study. Discovery of a new chemical entity may be termed as an independent variable however, progression of clinical development is dependent on the rate of discovery of new entities.

In an extrapolation of this logic Trochim (1989) compares an empirically based pattern with a predicted one or with several alternative predictions.

According to this method of analysis, the study may have a variety of outcomes. If for each outcome the initial predicted values have been found and at the same time alternative "patterns" of predicted values have not been found, strong causal inferences can be made.

3.5 Validity of Research Method

This research design is supposed to represent a logical set of statements and quality of the case design can also be judged using certain logical tests.

These tests are common to all social science methods and have been summarized by Yin (1994).

To ensure construct validity, multiple sources of evidence were used, the chain of evidence was clearly established and one of the key informants reviewed the interview notes and the draft case study report with me. The specific factors to be studied were drawn from the original objective of the study.

To ensure internal validity, pattern-matching analysis was used and to ensure external validity, three cases were examined.

Reliability was ensured by minimizing external variations. All the interviews used the same investigative questionnaire, the time allocated for each telephone interview was the same, done possibly at the same time of the day.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

Eli Lilly and Company (Lilly), a leading innovation-driven corporation, is developing a growing portfolio of best-in-class pharmaceutical products by applying the latest research from its own worldwide laboratories and from collaborations with eminent scientific organizations. Headquartered in Indianapolis, Indiana in the United States of America, Lilly seeks to provide answers through medicines and information for some of the world's most urgent medical needs.

Lilly is in a situation that most pharmaceutical companies find themselves in today.

Prozac® was the top selling prescription drug according to International Medical Services Health Data (IMS) data 2001. Since its launch in 1987 and its recent patent expiration in August 2001, it has totaled more than \$ 21 billion in sales. Lilly's problems are pandemic: pharmaceutical companies have become addicted to blockbuster medicines that generate massive growth but vanish once patents expire. Old blockbusters seem to be expiring all at once and some companies are mounting massive legal trials to defend them. At the same time, new potential blockbuster drugs are taking longer to reach the market. Lilly's troubles are particularly worrisome because it has actually managed to develop a robust pipeline instead of resorting to patent litigation.

A Food and Drug Administration (FDA) inspection of four Eli Lilly manufacturing sites in Indianapolis during November 2001 resulted in 50 new Good Manufacturing Practices (GMP) violations. In addition to those detected at the previous inspection. On the earlier occasion, the FDA issued a warning letter and ordered a temporary shutdown while corrections were being made. The re-inspection on December 19th 2001 jeopardizes not only two pending product approvals, Zyprexa IM ® and Forteo ® but also three other products in the firms 2002 pipeline.

This problem however is larger than Lilly itself and any single drug component. Lilly must not only identify new drug molecules rapidly but bring them to market quickly. The fastest and economical way of leveraging research to develop new drug molecules and commercialization as Lilly has identified is through strategic alliances with very selected partners.

Lilly seeks to answer complex problems through discovery and development of breakthrough medicines as well as through research and development collaborations with leading companies and universities that offer access to additional technologies and compounds.

Given this pivotal role of strategic alliances, I was excited when an opportunity arose to interview executives about the formation and evolution of strategic

alliances between Eli Lilly and three different partners namely Alkermes Incorporated, Takeda Pharmaceuticals North America and Ranbaxy Laboratories Limited

I distinctly chose to examine alliances in research and development which involves identification of new technologies – namely Alkermes and two alliances in commercialization and manufacturing where the approved drug molecule awaited being brought to a foreign market, Takeda Pharmaceuticals North America and Ranbaxy Laboratories Limited.

Although the analytical induction was used, I chose to analyze each case one by one in an incremental manner and research findings on the alliances, variables and dynamic aspects of the alliance were also presented case by case.

4.2 Alkermes Incorporated - Eli Lilly and Company Alliance.

Eli Lilly holds the leadership position in the global insulin market, which was valued at 4.3 billion at the end of 2000 by IMS Health. Lilly makes and markets Humalog® a fast acting insulin, Humulin®, a form of human insulin and the new innovative Humulin® and Humalog® Pen which are pre filled insulin delivery devices. The 2000 sales of Humulin® and Humalog® were \$ 1.11 billion and \$ 350.2 million respectively.

Previously insulin has always been administered by injection, this has proven to be uncomfortable thus a major drawback to compliance for most patients. Novo Nordisk, Pfizer and Aventis are now actively involved in the research and development of new innovative inhaled insulin products. To solidify their position in the insulin market on April 9, 2001 Eli Lilly committed itself to research and development of inhaled insulin as a technology but partnering with Alkermes Incorporated.

This broad, mutually exclusive agreement entails developing inhaled formulations of insulin, which includes short-acting and long-acting insulin and other potential diabetes products using Alkermes pulmonary drug delivery system. Both companies are not disclosing the financial terms of the deal but analysts have estimated its financial potential to Alkermes at \$ 100 million – making it the biggest deal yet for the company.

Eli Lilly has been very aggressive at licensing various technologies for alternative delivery of insulin and had just ended its agreement with Dura – Elan Pharmaceuticals to develop inhaled insulin products, in phase II trials due to clear technology failure.

Terms of Agreement that were disclosed to me:

- Alkermes will receive funding for product and process development activities, milestone payments and royalties based on product sales.

- Lilly receives exclusive global rights to products resulting from the collaboration. Lilly will also be responsible for conducting clinical trials, securing regulatory approvals and large-scale manufacturing world wide.

By all accounts this alliance is working. On June 24th 2001, preliminary results from a phase I clinical trial of Lilly's inhaled insulin based on Alkermes – AIR® pulmonary drug delivery system were presented at the American Diabetes Association conference in Philadelphia, Pennsylvania. This was a single administration study in healthy volunteers designed to test safety, tolerability, pharmacokinetics and pharmacodynamics of a wide range of insulin doses. The insulin formulation showed rapid onset of therapeutic action, dose-dependant glucose-lowering ability and competitive biopotency.

“This is the first demonstration of therapeutically relevant dosing efficiency for insulin using a simple inhaler to deliver an engineered formulation of insulin to the deep lung” – James Wright PhD, Senior Vice President, Alkermes Inc.

According to a study of partnerships of 150 top companies, alliances work well when both partners are strong in the functions they bring to the venture. The alliance between Eli Lilly and Company and Alkermes Incorporated complemented the strengths of each partner.

Eli Lilly and company is a leading innovation driven corporation which is developing a growing portfolio of best in class pharmaceutical products by applying the latest research from its worldwide laboratories and collaborations with eminent scientific organization. It is dedicated to finding more efficacious

and convenient approaches to the management of diabetes. For nearly two decades Eli Lilly and company have set the pace of research and development of rDNA derived protein drugs such as Humulin. Eli Lilly and Novo Nordisk each hold the top position in the global insulin market, which is presently valued at \$ 4.3 billion.

On the other hand, Alkermes Inc. is a leader in the development of products based on sophisticated drug delivery technologies. Its AIR[®] technology is a major innovation among pulmonary delivery systems. The unique AIR[®] particle is a low density, porous structure with a geometric diameter of 5-30micrometers. These patent protected particles can be delivered using small, simple inhalers, accommodate high drug doses and offer the potential for prolonged release.

The result of this has been efficient dry powder delivery of small molecules, peptides, protein and other macromolecule drug particles to the deep lung with clear advantages over other delivery methods.

This alliance combines Eli Lilly and Company's upstream R&D strength on identifying new innovative molecules for the management of diabetes and Alkermes incorporated sophisticated drug-delivery technology AIR[®] to further enhance drug particle administration by way of pulmonary delivery system. This complementing of each other's technological strengths and the promising results obtained in Phase I testing of inhaled insulin based on

Alkermes Inc. AIR® pulmonary drug delivery system has been a major reason for the success of the alliance.

Financially both Eli Lilly and company and Alkermes incorporated have benefited from the alliance. Though both companies are not disclosing the financial terms of this alliance, analysts have pegged its financial potential to Alkermes at \$ 100 million – making it the biggest deal yet for the company. Eli Lilly on the other hand has the opportunity to secure its position in the global inhaled insulin market which analyst's project will reach \$ 1 billion to \$ 3 billion, depending on commercial development.

The leadership of Eli Lilly and Company and the leadership of Alkermes Inc have complemented each other. The employees of both companies come from highly scientific backgrounds. Innovation is but a second nature to both companies.

"Lilly is a great partner with high scientific and product development standards that fit well with our own" David A Edwards, Scientific Founder AIR ®. Alkermes Inc.

"We are pleased to expand our strong working relationship with Lilly to include the development of inhaled insulin and other potential products. Our stated intention has been to demonstrate the performance of our insulin

formulations and simple inhalers in clinical trials prior to entering into a significant collaboration with a major insulin supplier. Having done so we are particularly pleased to be working with Lilly in light of their world leadership in insulin.” – Richard Pops, CEO Alkermes.

“Alkermes has been a leader in the field of pulmonary delivery of protein drugs through innovative technology that promises a significant improvement in patient care. Alkermes is an excellent partner because of its strong scientific and technical foundation” – Richard diMarchi, Group Vice President. Lilly Research Labs. Eli Lilly and Company.

The alliance executives meet often to resolve problems and plan for the changing needs of this R & D alliance. That ensures that strategic managerial operational and contractual issues that arise are resolved amicably.

Both Eli Lilly and Company and Alkermes clearly complement each other on strategic intent. Eli Lilly and company is an innovation-driven corporation committed to *“developing a growing portfolio of best-in-class pharmaceutical products by applying the latest research from its own worldwide laboratories and from collaborations with eminent scientific organizations”* This sets the tone for everything that happens at Eli Lilly and Company.

Alkermes Inc. on the other hand is committed to "the development of products based on sophisticated drug-delivery technologies"

In addition, Eli Lilly's continuously measures the extent to which the alliances complementary strategic intent is reinforced through its own "voice of the Alliance" survey that evaluates 14 dimensions essential to a healthy alliance which range from communication to leadership, trust and fairness. Both organizations take part in the survey.

4.2.1 Adding Value to Both Companies.

Not only has this alliance met the strategic intent of both partners, it has led to the value added for both companies in two dimensions.

- a) Access to the promising inhaled insulin market. Prior to entering this agreement, though Lilly held 45% of the global insulin market, this had the possibility of being jeopardized through the research development of the new promising inhaled insulin products. The Alkermes deal gives Lilly a chance to not only compete with other companies who are actively involved in R & D in this class of products namely Novo Nordisk, Aradigm, Pfizer, Aventis Pharma and inhaled therapeutic systems but to safeguard its leadership position in the global insulin market. With this agreement, Alkermes has augmented its R & D relationship with Lilly having previously worked successfully on an inhaled

recombinant human growth hormone formulation using Alkermes proprietary AIR® pulmonary drug delivery system. Though Alkermes was also not willing to disclose the financial terms of this agreement analysts have estimated it to be at \$ 100 million, making it the biggest deal yet for the company.

- b) Both companies are focused on providing efficacious non-invasive alternatives for the administration of insulin, which has been available as injection only. This targeted delivery of the lung, rapid onset of action of the drug compound and potential for prolonged release will be translated to key benefits to the diabetic patients the world over. It is worth while to note that Eli Lilly and company has had prior experience with Alkermes Incorporated in the ongoing collaboration research and development of inhaled human growth hormone (IGH). There is a distinct advantage in their insulin product development as they can leverage the synergies and systems previously established in their (IGH) collaboration.

This is an alliance in drug development and as such these statements are forward looking referring specifically to potential of inhaled formulations of insulin in the management of diabetes. However, as with any pharmaceutical agents underdevelopment, there are risks and uncertainties in the process of development and regulatory review.

There are distinct variances in the alliance as the drug candidate proceeds phase I to phase II/III clinical trials.

There are no guarantees that future clinical trials will confirm the preliminary results or that the product will receive regulatory approvals or prove to be commercially successful.

4.3 Ranbaxy Laboratories Ltd. - Eli Lilly and Company Alliance

India is fast becoming a sourcing centre for bulk drugs as it produces quality drugs at low costs. Ranbaxy Laboratories Ltd. in India has often drawn attention to the growing proportion of its overseas sales. The company is among the biggest generic pharmaceutical companies in the world and the wide geographical spread of its sales reduces the risk associated with its revenue.

Ranbaxy's core business formulations (drugs in ready-to-consume form) exports grew by 56% in the third quarter of 2001. Ranbaxy's exports contribute about 49% of the overall sales. The growth in its third quarter exports in relation to the corresponding period of the previous year is 24%, significantly higher than the overall sales growth of 16% for the same period. The domestic sales grew by 9% in the third quarter.

Ranbaxy Laboratories Ltd. and Eli Lilly formed a joint venture - Eli Lilly Ranbaxy Ltd in 1992.

In this agreement, Ranbaxy laboratories Ltd provided this new venture with the manufacturing support of various patented world Lilly products. Eli Lilly also expects this new venture to distribute its imported oncology and diabetes

products. This venture Eli Lilly Ranbaxy Limited is currently capitalized at about Rs 14 crore.

In third quarter 2000, Ranbaxy Laboratory Ltd. proposed to fully divest its equity holding in Eli Lilly Ranbaxy Ltd. the 50:50 joint venture with Eli Lilly and Company.

Eli Lilly was believed to be planning an additional infusion of Rs 95 crore in the joint venture company. For Ranbaxy to retain its 59% stake, it would have to make an investment of about Rs 37 crore.

At the same time, Ranbaxy's milestone payment of \$5. million for ciprofloxacin from Bayer AG was already delayed.

Ranbaxy's overseas operations particularly in the US had shown losses in the past 2 years. Ranbaxy's domestic formulation sales were about Rs 470 crore and overall turnover was Rs 1,700 crore. The joint venture had a Rs 80 crore turnover and in their view did not hold much significance except for the fact that the company had a presence in the diabetes market through this venture.

Ranbaxy Laboratories Ltd and Eli Lilly mutually terminated their manufacturing agreement in January 2002. As part of the termination, the US firm paid \$ 5 million to Ranbaxy pharmaceuticals Inc., a wholly owned subsidiary of Ranbaxy Laboratory Ltd. On January 29, 2002.

Eli Lilly also transferred and assigned intellectual property rights comprising certain patents and trademarks to Ranbaxy Pharmaceuticals Inc. This will allow

Ranbaxy Pharmaceuticals Inc. to manufacture the products transferred from Eli Lilly at its own facilities in New Jersey.

The key element of the agreement concerning the multi source generic products was also terminated. Specific to this termination, Eli Lilly paid \$ 10 million to Ranbaxy end of January 2002.

The Registrar of Companies in India approved the name change from Eli Lilly Ranbaxy Ltd. To Eli Lilly and Company (India) Pvt. Ltd. November 2001. This now reflected the acquisition of the Indian Pharma company stake in Eli Lilly Ranbaxy Ltd.

4.4 Takeda Pharmaceuticals North America - Eli Lilly and Company

Alliance

More than 1000 scientists at Takeda Japan are fuelling Takeda Pharmaceuticals North America's pipeline with new drug candidates for global use.

Takeda is focused on six therapeutic areas: diabetes, cardiovascular disease, CNS disorders, bone and joint diseases, allergy immunology and infectious disease.

Takeda's commitment to research and development is top priority. The success of ACTOS ® means a great deal more than just a single product, it is seen as a product growing to become the cornerstone of Takeda's product line as Takeda Pharmaceuticals North America achieves its goal of becoming an R& D intensive pharmaceutical company in the next decade.

In 1999 Takeda Chemical Industries of Japan entered a commercialization marketing collaboration with Eli Lilly and Company through its subsidiary Takeda pharmaceuticals North America. The collaboration between Eli Lilly and Takeda pharmaceuticals would be based on the co-promotion of ACTOS® (pioglitazone HCl) a type 2 diabetes oral therapy in the North American market.

The financial specifics of this alliance were not divulged to me. Globally, Takeda is a highly innovative pharmaceutical company whose first in the class product ACTOS® is seen as a strategic product for any pharmaceutical company with diabetes products in its portfolio. ACTOS® is a novel insulin sensitivity enhancer and it is now registered in the US and 70 other countries.

Pioneered by Takeda, the thiazolidinedione class of insulin sensitivity enhancers represents new treatment for patients with type 2 diabetes that treats one of the underlying causes of the disease – insulin resistance. Today, IMS Health worldwide estimates costs for treating diabetes are at more than \$ 1 billion annually and it is projected that over the next decade, those costs may double due to related complications of diabetes such as kidney damage, limb amputation and eyesight problems.

Eli Lilly clearly brings a vital component to this collaboration and Kunio Takeda expressed it quite clearly when he remarked "We are very excited about working with Lilly, a company that is known throughout the world as a leader in diabetes care"

By all accounts this alliance has worked and continues to be of importance to both Takeda Pharmaceuticals and Lilly.

According to a study of partnerships of 150 top companies, alliances work well when both partners are strong in the functions they bring to the venture. Takeda's strength in R& D has been demonstrated by its novel first-in-class ACTOS® (pioglitazone) making it a formidable partner for any pharmaceutical company with diabetes products.

Financially, both Lilly and Takeda have benefited from this alliance. ACTOS®, which was launched in the US in the second quarter of 1999 generated third quarter sales of \$ 61.2 million. This has grown to end 2001 sales of \$ 230 million.

The leadership of both Lilly and Takeda has been complimentary. Co promotions are hard work. They require a great deal of respect for your partner. "We invested a significant amount of time in building a strong relationship; defining a vision and setting values that will guide the alliance" Sam Hamanaka – Takeda Pharmaceuticals America Inc. "We are delighted to be working with Takeda because we share similar vision and commitment to innovation and globalization.

Takeda is a highly respected pharmaceutical company and has made an excellent partner for this important collaboration” Gino Santini – President US operations and global Marketing, Eli Lilly and Company.

4.4.1 Adding Value to Both Companies

Not only has this alliance met the strategic intent of both partners, it has led to value added for both companies on two dimensions.

- a) Improved total offering to physicians and patients. The mechanism of action of ACTOS ® acts synergistically with the administration of insulin in Type 2 diabetes. ACTOS ® seeks to address one of the key concerns of Type 2 diabetes – insulin resistance. This co-promotion collaboration where the Lilly expertise, experience and market cover of the diabetes global market with Takeda’s novel agent ACTOS® is a synergistic combination where diabetic patients would ultimately benefit in managing a chronic ailment.
- b) This collaboration gave Takeda Japan access to the largest pharmaceutical market in the world – North America. This would also enable Takeda to leverage the expertise Lilly has acquired in the North American market whilst allowing Eli Lilly to solidify its leadership position in the world insulin market by addressing the growing clinical concern in Type 2 diabetes – insulin resistance.

CHAPTER FIVE

5.0 FURTHER DISCUSSION

5.1 FURTHER DISCUSSION AND CROSS CASE ANALYSIS

Yin (1994) suggested that case studies should start with priori theoretical propositions. however Eisenhardt (1989) argued that case studies should start with a clean theoretical slate so that researchers are less likely to be bound by preconceived theoretical notions, however this is virtually impossible to achieve, given the theoretical nature of scientific inquiry.

This case study illustrates how pharmaceutical drug development companies forge alliances.

The alliances I chose to examine raised three key questions that needed to be answered in the affirmative when considering to forge an alliance in the pharmaceutical industry.

- a) Are the partner strengths complementary?
- b) Is the strategic intent of partner companies complementary?
- c) Does the alliance make a favorable financial contribution to both partner companies?

5.1.1 Alkermes Incorporated-Eli Lilly and Company Alliance

Lilly has a clear commitment to developing new and innovative medicines to manage chronic diseases such as diabetes.

Alkermes on the other hand has a commitment to developing innovative platform technologies that are used in administering medicines.

Clearly both their strategic intents are complementary. Lilly focused on medicines for chronic diseases, some of which were administered intravenously, and Alkermes' AIR® technology seeks to revolutionize drug administration by availing the option of administration by inhalation a far less painful option for diabetic patients.

The AIR® technology was the appropriate platform technology to foster an alliance between Alkermes and Lilly, as it was not only availing a research partner and funding for Alkermes but enabling Lilly to access a revolutionary route of administering insulin without compromising bioavailability and efficacy of insulin.

To further augment this relationship, Lilly already had experience with Alkermes on an ongoing trial for a human growth hormone using the AIR® technology. The preliminary results show that bioavailability was not compromised using pulmonary drug administration. This alliance also allowed Lilly and Alkermes to understand and adapt to each others work culture. The alliance was able to develop past the alliance contact phase to the alliance management phase successfully.

This previous research and development collaboration had lead to the formation of an alliance management team at Lilly whose key efforts are to resolve issues without bias as they arise within this collaboration and implement the alliance

communication plan so that both partners are updated on the alliance status and progression.

Lilly needed to explore inhalation technology for insulin administration as all its key competitors in the insulin market, Novo Nordisk, Pfizer and Aventis Pharma were in similar collaborations with other platform technology development companies, also seeking to revolutionize the way their insulin products were administered. This would potentially have a great financial impact on Lilly as it would affect Lilly's global market share in insulin products.

Alkermes had invested into the AIR® technology and needed a drug molecule to further their research and demonstrate effective administration through inhalation. This further research would allow Alkermes to eventually commercialize their AIR technology therefore there was an immediate financial benefit and possible future benefit to be derived by Alkermes in this collaboration.

The technology basis of this alliance is also the weakness of this collaboration, should this technology prove to be less effective than intravenous administration then this collaboration will be terminated.

Lilly has its own platform technology the 'insulin pen', a discreet device with a short, fine retractable and disposable needle with pre-filled insulin cartridges. This technology makes insulin administration less painful, convenient and discreet for diabetic patients. The 'insulin pen' could in itself act as a future competitor for insulin administered using the AIR® technology should the latter prove effective.

The AIR technology is in clinical trials and as it proceeds from phase I to III studies, the objectives of the study change from efficacy to safety, it follows that

the inputs from Alkermes and Lilly will change to meet these objectives. The technology has shown promising preliminary results in phase I. This alliance is important to both companies and continues to evolve in line with Alkermes and Lilly's complementary strategic intents.

5.1.2 Takeda Pharmaceuticals North America-Eli Lilly and Company

Alliance

Lilly also holds the leadership position in the North American insulin market, they also have well established relationships with health management organizations, key endocrinologists and have a large well trained sales force.

One of the key concerns in the management of type II diabetes is a phenomenon called 'insulin resistance'; the patient with time requires more and more insulin to achieve the effective glucose control.

Takeda has a research commitment to developing innovative products in Endocrinology, focusing in the management of diabetes. They developed the first thiazolidinedione (TDZ) ACTOS® that seeks to address the 'insulin resistance' phenomenon and wanted to market this new molecule in North America the largest pharmaceutical market in the world.

Both companies had strategic intents that complemented each other, Takeda had a first-in-its-class TDZ which it wanted to market in North America and Lilly the global insulin market leader wanted to not only maintain this position but grow its

market share by offering a solution to a growing concern in the management of type II diabetes.

This Co-Promotion agreement has a different level of commitment as compared to the conventional research and development alliances seen in the industry. Lilly sales representatives take ownership of the drug information dissemination to their Humulin® and Humalog® physicians by actively presenting ACTOS® as a synergistic product to insulin in suitable patients who exhibit insulin resistance.

The synergy exhibited by ACTOS® and insulin was the driving factor for the initial alliance contact. ACTOS® continues to increase its market share in North America, which has led to the success of this alliance.

This collaboration is an exclusive marketing agreement by which Takeda cannot enter any other marketing alliance with other companies marketing insulin products within the region. This can be seen as a calculated risk, as Takeda will not have access to Lilly's competitors' market strongholds whilst in this agreement.

However as Takeda's experience in the North American market increases, they may seek to explore other partners or chose to market ACTOS® on their own.

5.1.3 Ranbaxy Laboratories Ltd.-Eli Lilly and Company Alliance

Research and development alliances with Indian counterparts are still not considered viable alternatives as India continues to lag behind in the enforcement of intellectual property rights as dictated by the TRIPS agreements.

A Bill was passed in India early 2002 that allows for product patents to be introduced closer to the 2005 WTO compliance deadline. This will widen the scope of compulsory licensing and will include provisions to ensure affordability and accessibility of drugs in the event of a national health emergency. Pharmaceutical multinational companies could apply for the exclusive marketing rights provision to bring its products into India under this short umbrella of protection.

5.2 LIMITATIONS OF THE STUDY

Several limitations can be noted in this case study. First the findings had only one research and development alliance examined, yet two commercialization alliances were examined. Therefore generalization of these findings to other alliances should be made with caution.

Second, out of the three alliances I examined, only one commercialization collaboration did not meet its objective and had to be dissolved. This commercialization alliance that had a markedly different external environment cannot be used to generalize the cause of this outcome.

A third limitation is associated with the lack of a clear picture of the individual management style of each alliance team. This was difficult to gauge in the telephone interviews and this could have influenced the outcome of the alliance.

Fourth, the analyses conducted in this study were partially based on retrospective data, which might have introduced an additional bias as a result of faulty memory or retrospective sense-making on the part of my interviewees. This problem

however is not critical as multiple sources of data were available and data triangulation among these sources revealed a high level of consistency.

Fifth, there are other factors that influence the outcome of an alliance other than the existence of complementary strategic intent, leadership, strengths or financial contribution between partners, which I chose to examine.

A final limitation is related to sampling, this study is restricted to one research and development alliance and two commercialization alliances at Lilly.

5.3 CONCLUSIONS

Many companies are learning that they must collaborate to compete successfully.

The days of flat-out, predatory competition seem to be over.

Divergent approaches to collaborations are the most prevalent, however Lilly seeks to pursue a strategy of “discovery without walls”. Lilly has licensing, joint marketing and distribution with other companies, but the clear emphasis is on research. Moving from individual learning to organizational learning has been the most daunting task for Lilly.

When Lilly established the Office of Alliance Management (OAM) it made a commitment in making alliances part of their overall corporate strategy. The OAM then went on to develop tools and processes such as the ‘Voice of the Alliance’ and the Lilly Alliance Management Process (LAMP) that they could use to support the alliance.

The OAM seeks to ensure that Lilly builds and implements all capabilities required to attract partners, manage alliances and realize the full alliance value for Lilly and its partners.

Beyond this mission, the OAM is committed to:

- Being an advocate for the alliance partner within Lilly
- Developing and utilizing best practices
- Seeking feed back for partners on how well they are doing within the partnership and respond to feedback
- Training and supporting all Lilly staff who interact with partners and developing Lilly's ability to operate across cultures in different environments.

Prior to the formation of the OAM, an internal review of Lilly partnering practices showed that the company may have been lucky, rather than proficient at alliance management. The successes clearly were more dependent on the individual talent and goodwill of people involved in the alliance- from both sides- than on any kind of systematic management procedure.

The findings of the comparative case study provide confirmative evidence that member partners strategic intents and strengths must be complementary.

The alliance must seek to ultimately make a contribution to either the financial or strategic health of member partners.

The external regulatory environment plays a key role in the final outcome of alliances in the pharmaceutical industry.

5.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Finally I would like to offer several suggestions for future research that will not only extend this study but overcome several of its limitations.

This study should also seek to determine if a partner corporate strategy includes formation of alliances, how will this influence the development and final outcome of any alliance it forges?

Valuable insights into the dynamic relationships between complementary strategic intent strengths and alliance outcome can be gained from studies that trace the alliance contact, alliance management and outcome in detail over time.

Manufacturing alliances should also be included in this study to determine if they are influenced by the same set of factors as research and development alliance and commercialization alliances.

Further research should also focus on member partners long-term commitment and initiatives within alliances that seek to develop partner competence within the alliance and how both influence the outcome of an alliance.

The suggestions above will not only clarify the causal relationship between strategic intent, member strength, alliance financial contribution to partners and alliance outcome but shed light on whether the alliance contact triggering factors determine the success or failure of an alliance.

REFERENCES

Alkermes Inc./Eli Lilly and Company, Action profile for a new rapid acting inhaled insulin with high Biopotency. American Diabetes Association conference, Philadelphia, Pennsylvania, June 24, 2001.

Arndt, M.(2001), "Eli Lilly: Life After Prozac", Business Week.

Teng,B.,Das,T.(1999). "Managing Risks in Strategic Alliances", Academy of Management Executive, pp 50-56.

Datta, J.(2001). "India: Eli Lilly expects a tough road ahead after losing Prozac" Businessline.

Datta, J. (2001), "India: Fever grips Eli Lilly as Prozac goes off patent", Businessline.

Datta, J.(2002). " MNC investment plans 'drugged' in patents", Businessline.

Dickinson, J.(2002), " Lilly in FDA Trouble". Medical Marketing and Media

Doz, Y., Hamel, G.(1998). Alliance Advantage, Cambridge, MA, Harvard Business School Press.

Drucker, P.(199), Management challenges for the 21st century, Harper Business.

Dyer, J., Kale, P., Singh, H.(2001), "How to Make Strategic Alliances Work", MIT Sloan Management Review.

Eisenhardt, K.(1989). "Building theories from case study research". Academy of Management Review.

Emory, W.(1976). Business Research Methods, Irwin Inc.

Futrell, D., Slugay, M., Stephens, C. (2001). "Becoming a Premier Partner: Measuring, managing and changing partnering capabilities at Eli Lilly and Company", Journal of Commercial Biotechnology.

Gomes, B.(1998), "Do you really have an alliance strategy?". Strategy and Leadership.

Gomes, B.(1996). The Alliance Revolution: The New Shape of Business Rivalry, Cambridge; Harvard University Press.

- Gopal .K., Smith ,D. (2000). "Lilly loses a big one". Pharmaceutical Executive.
- Gueth. A.(2001). "Entering into an Alliance with Big Pharma- benchmarks for Drug Delivery contract service providers". Pharmaceutical Technology.
- Gueth. A., Simms, N., Harrison, R.(2001). "Alliances, Restructuring or Cancellation of: Dealmaking strategies: Management Issues". IN VIVO-the business and medicine report.
- Habbach, S.(1987). Writing Research Papers Across the Curriculum. MLA Edition.
- Hamilton. W.(1993). "Strategic choices in technology management-Lessons from Biotechnology". Review of Business.
- Henott, G.(1979). The Dynamics of Planned Educational Change.
- Herper, M.(2002). "Lilly's Blockbuster Peril". Forbes.
- India (2001). "Eli Lilly expects a tough road ahead after losing Prozac". Businessline.
- India (2001). "Eli Lilly Ranbaxy name change". Businessline.
- India (2001). "Eli Lilly reiterates India focus". Businessline.
- India (2001). "Eli Lilly to put India on its bulk drugs sourcing map". Businessline.
- India (2001). "Market reaction misplaced?". Businessline.
- India (2000). "Partial divestment by Ranbaxy preferable". Businessline.
- India (2001). "Ranbaxy completes deal with Eli Lilly". Businessline.
- India (2000). "Ranbaxy plans to exit Eli Lilly joint venture". Businessline.
- India (2002). "Ranbaxy to get \$15 million from Eli Lilly divorce". Businessline.
- (2000). Indianapolis Business Journal.
- Jarillo, J., Stevenson, H. (1991). "Co-operative Strategies- the payoffs and the pitfalls". Long Range Planning.
- (2001). Journal of Commercial Biotechnology.
- Kanter. R.(1994). "Collaborative Advantage: The Art of Alliances". Harvard Business Review, pp 96-108.

Krause, C.(2001), "Eli Lilly and Alkermes form a pact for inhaled insulin products", Chemical Market Reporter.

Kuglin, F., Hook, J.(2002). " Building, Leading and Managing Strategic Alliances: How to work effectively with partner companies", Cap Gemini Ernst and Young US LLC.

Lynch, R. (1993), Business Alliances Guide: the hidden competitive weapon. Wiley.

(2001). Pharmaceutical Technology.

Porter, M (1990), Competitive Advantage of Nations . Free Press.

Powell, W.(1998), "Learning from collaborations: Knowledge and networks in the biotechnology and pharmaceutical industries", California Management Review.

Rumelt, R., Schendel, D., Teece, D.(1994), Fundamental Issues in Strategy- a research agenda. Harvard Business School press.

Smith, D., Gopal, K.(2000), "Lilly loses a big one", Pharmaceutical Executive .

Speckman, R., MacAvoy, T.(2000), Alliance Competence-Maximizing the Value of your Partnerships. Wiley and Sons.

Starr, C.(1991), "Darwin's Theory of Evolution strikes the Drug Industry", Drug Topics.

Stringer, J.(2000),"Alkermes pumps AIR™ into drug deal", Massachusetts High Tech.

Wampler,J.,Fogel,D.(1996). Strategic Alliances: An Intergrated Health Systems Alternative.

Yan, A. Gray, B.(1994), "Bargaining power, management control and performance in Uni", Academy of Management Journal.

Yin, R. (1994). Case Study Research: Design and Methods. Sage 2nd Edition.

Young, P (2002), "The Biotechnology M&A market", Chemical Week.

WEB Based References

The web based references were all accessed in June and July 2002. Information retrieved in the above defined period was utilized in this study report.

www.gwu.edu/gelman

The George Washington University

Gelman Library System

this is an electronic repository of all books and library materials of the George Washington University. It is only accessible to faculty and registered students of the George Washington University. Access is granted through an assigned Personal Identification Number-GWorld card.

www.aladin.wrlc.org

Washington Research Libraries Catalog(WRLC)

this is an electronic repository of all books and library materials of the George Washington University, American University, Catholic University of America, Gallaudet University, George Mason University and Marymount University. It is only accessible to faculty and registered students of the above named universities. WRLC is a consortium of the above named universities, George Washington University

students, faculty and staff may borrow materials through the Consortium Loan Service or directly using their GWorld card. Access is granted through an assigned Personal Identification Number-GWorld card.

www.fda.gov/cder/guidance

FDA Center for Drug Evaluation and Research

www.imshealth.com

International Medical Services Health- a global health data tracking organization.

www.lilly.com

www.alkermes.com

www.wto.org

www.pharmtech.com

www.alliancestrategy.com

www.allianceanalyst.com

www.strategic-alliances.org

Association of Strategic Alliance Professionals
(ASAP)

Appendices:

1. Letter of Introduction to the Interviewees.

4th June 2002

Catherine Wangui Wachira

Tel: 703-655-8990

Director of Alliance Management

Eli Lilly and Company

Dear Sir,

RE: Strategic alliances questionnaire

The time has come for me to collect data for the research project which marks the end of my masters program. This long awaited moment, avails me the opportunity to do research in an area that is of great personal interest, the pharmaceutical industry.

The primary objective of this study is to determine which factors led to the varying outcomes in the three alliances.

The attached questionnaire has been designed to first determine criteria used to select the partner and secondly identify the critical factors that influenced, possibly even transformed the alliance.

The information and data collected will be used solely for academic purposes and will be treated in strict confidence. Please let me know if you would be interested in the findings, and I will be able to share them with you.

Thank you in advance for your cooperation.

Yours Sincerely,

Catherine Wangui Wachira

MBA Student

Professor Bing-Sheng Teng

The George Washington University

Washington, DC 20052

2. Questionnaire

SECTION A

Kindly answer the questions to the best of your ability.

1. What was the primary objective of the alliance?
2. What were the secondary objectives of the alliance?
3. What was the level of commitment expected of each partner within the alliance?
4. What were the partner's strengths identified to the onset of the collaboration?
5. Were these strengths complimentary to the objectives of the alliance?
6. If both partners strengths were complimentary, what was the effect if any on the alliance?
7. If both partners strengths were not complimentary, what was the effect if any on the alliance?
8. What was the strategic intent of the partner at the onset of the collaboration?
9. Was the strategic intent of the partner complimentary to the objectives of the alliance?
10. If yes, in what way was the partner's strategic intent complimentary to Eli Lilly's strategic intent?
11. If no, in what way was the partner's strategic intent not complimentary to Eli Lilly's strategic intent?
12. If both partners strategic intents were not complimentary, what was the effect if any on the alliance?
13. How would you define the leadership of this alliance?
14. Was the leadership complimentary to the objectives of the alliance?

15. If yes, in what way was the partner's leadership complimentary to the objectives of the alliance?
16. If no, in what way was the partner's leadership not complimentary to objectives of the alliance?
17. If both partner's leadership was not complimentary to the alliance objectives, what was the effect if any on the alliance?
18. Did the alliance experience any significant change?
19. If yes, what type of change occurred?
20. At what stage of the alliance did this change occur?
21. What specific aspects of the alliance were affected?
22. How were they affected?
23. Did this change(s) lead to new objectives being established?
24. Did this change(s) lead to the reformation or dissolution of the alliance?
25. What impact if any did this alliance have on the strategic outlook of the partner and the strategic outlook of Eli Lilly and Company?
26. What impact if any did this alliance have on the financial outlook of the partner and the financial outlook of Eli Lilly and Company?

UNIVERSITY OF NAIROBI
LIBRARY