

CAMBRIDGE LABORATORIES: PROTEOMICS

David Wesley prepared this case under the supervision of Professors Henry W. Lane and Dennis Shaughnessy solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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Version: (A) 2006-09-22

Paul Henderson scanned the headlines of *The Boston Globe* before beginning his Monday morning commute to Cambridge, Massachusetts, where he served as senior vice-president for corporate development and general counsel for Cambridge Laboratories (Cambridge Labs). What caught his eye this morning was a headline titled, “Midsize Biotech Firms Take Hit, Many Struggling to Raise Cash.”¹

As Henderson scrutinized the newspaper article, he could not help but notice the contradictions. On the one hand, the paper rightly pointed out that biotech firms “are struggling to raise cash, and many are trading at a small fraction of what they were worth just two years ago during the biggest boom in the industry’s history.” Yet, “there’s been a resurgence of interest . . . in early-stage companies,” an industry analyst was quoted as saying. The journalist added, “Investors are placing a premium on companies that are focused on producing drugs.”

The Globe article reiterated much of what Henderson already knew: namely, that many genomics and proteomics firms had benefited from a short-lived “irrational exuberance”² that created spectacular valuations and allowed some laboratories to

¹“Midsize Biotech Firms Take Hit, Many Struggling to Raise Cash,” *Boston Globe*, June 10, 2002.

²Alan Greenspan used the term “irrational exuberance” to refer to stock market valuations that were not supported by economic performance. From a speech given at the Annual Dinner and Francis Boyer Lecture of The American Enterprise Institute for Public Policy Research, Washington, D.C., December 5, 1996.

raise significant capital through public offerings. Investors eventually realized that drug discovery was a long process and that many years would pass before most of these companies would ever recognize revenues. As suddenly as they had risen to prominence, many labs had become pariahs of Wall Street. Meanwhile, researchers remained optimistic about the potential to revolutionize health care by treating disease at the molecular level.

As head of his company's mergers and acquisitions, Henderson reviewed many potential biotech partnerships and acquisitions. Recently, he had received a joint venture proposal from Canterbury Proteomics Ltd. (CPL), a small Australian proteomics firm that wanted to enhance its drug discovery research by establishing a presence in the United States. Canterbury Proteomics had patented technology that the company's founders believed would eventually lead to the discovery of blockbuster drugs. In exchange for start-up capital amounting to US\$5 million,³ CPL promised millions of dollars in downstream drug royalties for Cambridge Labs.

Although CPL's managers seemed confident in their ability to deliver a competitive product, Henderson wondered if a drug development "premium" was really warranted. Was proteomics another scientific fad that consisted of more hype than substance, or would it usher in a new and unprecedented age of discovery leading to the development of new drugs to treat everything from infectious disease to cancer? The Cambridge Labs management team constantly received investment proposals from high-potential firms, but only invested in five per cent to 10 per cent of the proposals reviewed. Henderson wondered if Canterbury Proteomics should be one of them, and if so, under what terms.

CAMBRIDGE LABORATORIES

Founded in 1947, Cambridge Laboratories provided laboratory services for use in drug discovery research and the development and testing of new pharmaceuticals. At the height of the technology stock market bubble, Cambridge Labs launched an initial public offering (IPO) that raised \$257 million, facilitating further expansion (Financial summaries are provided in Exhibits 1-3). When the economy began to falter in 2001, Cambridge Labs remained one of the few companies that continued to grow.⁴

Cambridge Labs served hundreds of laboratories in more than 50 countries worldwide. These were primarily large pharmaceutical companies, including the 10 largest pharmaceutical companies (based on 2001 revenues). Together with

³All monies in US\$ unless otherwise specified.

⁴In early 2000, the failure of prominent Internet companies, such as E-toys and Value America, caused many investors to reevaluate the market. As bearish sentiment began to take hold, the technology shares entered into an extended downward spiral. In March 2000, the technology laden Nasdaq exchange peaked at 5,000. By year's end, approximately half of that index's value had been erased.

biotechnology firms, pharmaceutical companies accounted more than 75 per cent of the company's sales. The remaining customers included animal health, medical device and diagnostic companies, as well as hospitals, academic institutions and government agencies. The company did very little of its own research and development in the creation of new laboratory services.⁵ Instead, most of the company's technology was licensed or purchased from third parties, or developed through collaboration with universities and biotechnology firms.

As a result of its leadership position in the laboratory outsourcing services, Cambridge had not lost any of its 20 largest customers in more than 10 years, while its largest customer accounted for less than three per cent of total revenues. The company maintained 78 facilities in 16 countries and had nearly 5,000 employees, including approximately 250 with advanced degrees such as DVM, PhD or MD.

The Cambridge Labs publicly announced its strategic growth objectives to grow its existing businesses by between 12 per cent and 15 per cent annually and its entire business by 20 per cent. This left a "strategic growth gap" of five per cent to eight per cent each year. Cambridge Labs then pursued technology platform acquisitions, joint ventures, technology licensing and strategic partnerships to fill the gap. Henderson commented:

If we were satisfied with just growing our existing business we would be too risk averse. Our investors have come to expect that we will deliver on our commitment each quarter, which creates additional pressure to perform particularly when the stock price reached \$40 in 2002 from an IPO price of \$16.

In 2001, Cambridge Labs increased revenues to \$465 million, a 50 per cent improvement over the previous year, and enjoyed a profit margin of about 20 per cent. Much of the company's growth was due to two large acquisitions that enhanced revenues by \$100 million. The company was also the recipient of numerous accolades and honors from prominent business journals and newspapers.

Laboratory Services Division

Laboratory Services was Cambridge Labs' largest and fastest growing division (a summary of other services offered by the company is provided in Exhibit 4). By employing technologies that were licensed or purchased from universities and biotechnology firms, Laboratory Services sought to predict the potential success of new drug candidates. Laboratory service firms, such as Cambridge Labs, expanded in order to meet demand from biotechnology and pharmaceuticals firms. The

⁵Research and development (R&D) expenditures were approximately \$500,000 in 1999, \$1 million in 2000 and \$2 million in 2001.

company's chief executive officer (CEO) commented on the impact this was having on Cambridge Labs:

Laboratory Services is our fastest growing business, which is well in excess of 40 per cent annually. Much of this expansion is driven by genomics, which is a field that is growing worldwide, and we expect to see this growth continue for the foreseeable future. Our facilities here, as well as in California, Japan and France have all had to expand to meet demand.

Pharmaceutical clients were interested in outsourcing many routine trials as long as laboratory service firms were able to provide quality, reliable service. Cambridge Labs prided itself on that ability as Henderson commented, "We can conduct these trials faster and cheaper than pharmaceutical companies can internally, and without sacrificing quality."

With demand for outsourced laboratory services continuing to grow, expanding existing facilities became a priority, and Cambridge Labs could not hope to meet that demand alone. The company's CEO explained:

We absolutely need several players to service the outsourcing trend. We have backlogs of several months across the board in our toxicology business and a lot of that is contractual in nature, contracts lasting from 90 days to a year. In response, we continue to add space, as do other companies. It's clear that biotech companies want to continue outsourcing these services. And as long as they have good companies to outsource to, I'm sure they will.

DRUG DISCOVERY

The Role of Chemistry

The growth of the pharmaceutical industry depended on its ability to develop new drugs. Thus, drug companies spent from 10 per cent to 20 per cent of revenues on R&D, or some \$50 billion a year industry-wide. Despite generous increases in annual R&D budgets, few new drugs reached the market, while the cost of bringing a single drug to market increased to more than \$800 million in 2001 from \$230 million in 1987.⁶ Jim York, a senior scientist from Cambridge's Discovery Services division, explained:

The industry is in a well-publicized R&D productivity trough, and hence there is great interest in small companies that are well along in the development of new compounds. The lack of R&D

⁶"Research Cost For New Drugs Said to Soar," *The New York Times*, December 1, 2001.

productivity has also led to the increased valuations for those small companies with well-developed compounds to serve as stopgaps for large Pharma's pipeline woes.

Meanwhile the expiration of patents led to pricing pressures as more generic drugs entered the market. Even when drug companies lowered prices, they often saw their market share decline by as much as 80 per cent during the first year following the launch of an equivalent generic brand.

In the past, drug discovery was focused on chemistry, as researchers attempted to identify compounds that could target specific diseases. Improved instrumentation allowed the number of compounds being reviewed to increase substantially in the 1980s and 1990s. Nevertheless, higher throughput did not deliver many promising drug prospects. Henderson recalled a recent visit by a lead scientist from a major pharmaceutical company:

This person was in charge of 400 chemists all working on identifying new drugs. In more than 20 years, his team has yet to identify one candidate for a new drug. He seemed discouraged by the fact that 20 years of work had been wasted. And his experience was not unusual. In the last 50 years, drug companies have only brought 500 new drugs to market, and most of those have been improvements on drugs that already existed.

The Shift Toward Genomics and Proteomics

In the 1990s, drug discovery began to move away from its roots in chemistry to rely increasingly on biological research. Advances in genetics, for example, gave researchers new hope that the foundation for many diseases could be found in a person's genes. They sought to identify measurable changes in biological systems, known as biomarkers, which increased the propensity for disease. High cholesterol, for example, would be considered a biomarker for heart disease. In this case, cholesterol reduction through medication and diet could help patients to reduce the risk of heart attack. Genetic biomarkers worked on the same principle. By identifying differences between healthy individuals and diseased individuals at the molecular level, new drugs could be developed to specifically target key genes and proteins. Some chemical compounds that could be used to treat disease probably already existed in large pharmaceutical laboratories around the world, but had yet to be matched with appropriate biomarkers.⁷

⁷Biomarkers were commonly interpreted to be different from drug targets. While biomarkers and drug targets were often the same, usually biomarkers were surrogate measures of the **impact** of dysfunction generated by disease, condition or treatment. Treatments directed at the target can use biomarkers to assess their impact, efficacy, treatment scenarios, etc.

The greatest challenge for researchers was to process the massive amounts of data encoded in living cells.⁸ Cataloguing that data in large relational databases consumed all the resources of many of the most advanced computers available.⁹ One such process was the sequencing of the human genome, which began in earnest in 1988 as a government-funded project administered by the National Institutes of Health (NIH) and the Department of Energy (DOE). By 1998, advances in computer systems¹⁰ allowed a privately funded company, known as Celera Genomics, to enter the fray with a promise to sequence the entire human genome by 2001. With great fanfare, both organizations published their results in February 2001.

Amazing as this feat was, it represented a small (but important) step toward understanding the role of genetics in regulating biological processes. According to industry analyst, Dr. Kevin Davies:

Mining the human genome is a massive computational problem, but nothing compared to the daunting problems posed by proteomics — the total characterization of the identities, structures, complexes, networks and locations of all the proteins in the body. Understanding the properties of a single protein is hard enough. It takes a couple of months for a Cray T3¹¹ to simulate the folding of an average protein in [the lab]; the natural process takes mere microseconds.¹²

Not only were proteins more complex than DNA (genes had four bases while proteins were made from 20 amino acids), the number of proteins in the human body was estimated at more than one million, as many as 30 times the number of genes. As well, although DNA remained relatively stable throughout the human body, each cell expressed different proteins that interacted with each other in different ways. Moreover, protein expression changed with time, as aging, diet, stress and other external factors took their toll.

To characterize the sheer magnitude of the difference between genomics and proteomics, when Celera and the U.S. government completed the sequencing of the human genome in 2001, proteomics researchers at various sites around the world were still struggling to identify the proteome of a single strain of yeast (an

⁸The genetic code of a human being comprised more than 200 times the data in a New York City phone book.

⁹One example was the \$45 million National Science Foundation-funded Terascale Computing System in Pittsburg, Pennsylvania. Completed in 2001, the system was roughly the size of a basketball court, used 14 miles of interconnect cable, seven miles of copper cable and a mile of fiber-optic cable for data handling. It consumed 664 kilowatts of power (equivalent to 500 homes) and produced heat equivalent to burning 169 pounds of coal an hour. It was cooled by 900 gallons of circulating water per minute and 12 30-ton air-handling units (equivalent to 375 room air conditioners).

¹⁰For more information on supercomputers and their role in Life Sciences, see "Note on Supercomputing," Northeastern University Case Series No. 9B03E004, Ivey Publishing, 2003.

¹¹The Cray T3 was ranked 15 among the 500 most powerful computers in the world in 2001.

¹²"Bio-IT: When Two Worlds Collide," Bio-IT World, March 2002.

organism that contained only a fraction of the number of genes contained in the human genome). “The mouse genome is more than 99 per cent the same as the human genome,” explained Henderson. “But genomics doesn’t matter because only four per cent of the proteins expressed from those genes mimic humans, and everything about disease depends on the expression of proteins.”

Leading Companies in Genomics and Proteomics Research

Beyond university and government laboratories, which tended not to commercialize their discoveries, the number of entrants into the field of proteomic research services was limited. A lack of technological expertise and/or capital tended to act as barriers to entry.

Some of the more well-known companies were Celera Genomics, Large Scale Biology, MDS Proteomics, Oxford GlycoSciences, Millennium Pharmaceuticals and GeneProt. The business models for each of these were based upon lucrative royalty arrangements with partial payments upon initiation and potentially large payments upon the successful development of new drugs. All were in the process of becoming drug companies to some degree.

Millennium Pharmaceuticals had essentially become a drug development company, while Large Scale Biology and Celera were still at an early stage of the process. For each of these companies, initial commercial deals were either collaborations or based on the payment of royalties. These collaborations were few in number and large in scale. For example, approximately 80 per cent of Large Scale Biology’s revenue was derived from a single collaboration with Dow AgroSciences (a division of Dow Chemical). Likewise, GeneProt derived most of its revenue from collaboration with Novartis.

After seeing meteoric valuations in 1999 and 2000, shares for the entire sector plunged in 2001 as investors pulled away from small loss-making technology companies. Oxford GlycoSciences (OGS) was the first company to enter the field of proteomics on a large scale, raising \$230 million from stock offerings in 1999 and 2000.

With its primary focus being drug discovery, OGS had already amassed a large database of patented biomarkers. The company planned to release its first drug in early 2003, a compound used to treat a rare illness known as Gaucher Disease.¹³ Eventually, OGS hoped that additional discoveries would allow it to compete with leading pharmaceutical firms.¹⁴ In the first half of 2002, Oxford GlycoSciences reported a loss of \$31 million on \$9.3 million in revenues. The company’s market value plunged from more than \$4.5 billion in March 2000 to just over \$138 million

¹³“From Proteins to Profits,” *Business Week*, December 26, 2002.

¹⁴“The thing is: CAT/OGS,” *Independent on Sunday*, January 26, 2003.

in 2002, even though the company had more than \$240 million in cash and no appreciable debt.¹⁵

Toronto-based MDS Proteomics, another important player in the proteomics field, posted a loss of \$35 million on revenues of \$2 million for 2001. The company said that its main challenge was “the building of relationships with potential pharma and biotech partners”¹⁶ in its quest “to become a world-leading proteomics drug-discovery business.”¹⁷

Large Scale Biology of New Jersey was nearly bankrupt after its contract with Dow AgroSciences, which accounted for more than 80 per cent of the company’s revenues, ended in August 2001. The company posted average annual losses of more than \$23 million from 1999 to 2001, and saw its stock price decline by more than 97 per cent between August 2000 and June 2002. In the future, the company hoped to be able generate revenue from contract research and licensing agreements.¹⁸

Other companies did not fare much better. Millennium Pharmaceuticals’ stock was down more than 90 per cent after posting losses of nearly \$200 million in 2001. Celera Genomics, which moved away from genetic sequencing after completing the Human Genome Project, was down more than 93 per cent on a loss of more than \$40 million for the same period. A spokesperson for Celera Genomics commented:

We believe that Celera remains the most promising company to discover and develop pharmaceuticals and diagnostics from an understanding of disease through molecular biology.¹⁹

Investors were skeptical that a research laboratory could compete with large pharmaceutical companies. Celera founder Craig Venter shared that opinion. Shortly after resigning as CEO, he reflected on his own situation. “I made a million dollars the hard way. I started with a billion dollars and worked my way down!”²⁰

GeneProt described itself as “a global industrial-scale proteomics company” involved “in the discovery and development of new therapeutic proteins, protein drug targets and protein biomarkers.” The privately held company used technology licensed by OGS and housed the world’s largest commercial supercomputer at its

¹⁵“From Proteins to Profits,” *Business Week*, December 26, 2002.

¹⁶“MDS Reports Fourth Quarter Fiscal 2002 Results,” *PRNewswire*, December 12, 2002.

¹⁷“Science Firm MDS Eyes Drug Discovery,” *Montreal Gazette*, April 1, 2002.

¹⁸Source: Large Scale Biology SEC filings.

¹⁹“Genome Pioneer Celera Lays Off 132,” *The Washington Times*, June 12, 2002.

²⁰“A Bubble Punctured by Realism,” *The Financial Times*, November 11, 2002.

facilities in Geneva, Switzerland. The company's partners included several leading biotechnology and pharmaceutical firms, including Novartis.²¹

Few companies developing proteomics technology were interested in providing outsourcing services to large pharmaceutical and biotechnology companies. Instead, most believed that the identification of potential drug targets was worth far more in terms of future royalties than could be gained by selling testing services or technology.

Two companies that did provide research and testing services on a fee-for-service basis or through contracts were Genomic Solutions and Proteomic Research Services, both based in Michigan. Proteomic Research Services was a relatively new company with a small staff and little instrumentation. Genomic Solutions, a company that designed and manufactured genomic and proteomic instrumentation, had been around longer, but services were minor component of the company's overall business, accounting for approximately eight per cent of revenues (\$1.2 million in 2001).

THE JOINT VENTURE PROPOSAL

The PMC Acquisition

In February 2001, Cambridge Labs purchased Premier Medical Corporation (PMC) for \$52 million, making it the company's largest acquisition to date.²² Based in Amherst, Massachusetts, PMC was an international contract research organization that provided pre-clinical drug discovery and development services to the biopharmaceutical industry. Services included safety, efficacy and quality control testing for early stage pharmaceutical products. Reflecting on the acquisition, one PMC scientist noted:

We had been bought and sold a number of times before by organizations that didn't know what we did. Cambridge certainly knew what we did. They had a really good brand name and that made it a good fit for us because it got us through the door with important clients.

Cambridge has very disciplined business practices. That was probably the biggest organizational adjustment for us. They brought a higher level of discipline and a higher level of expectation than the companies we were with before.

²¹"GeneProt Licenses OGS' Automated Proteomics Patents," *Oxford GlycoSciences Press Release*, February 8, 2002.

²²"The PMC acquisition added \$75 million to revenues, which was nearly double any previous Cambridge acquisition.

Even while the integration of PMC was still a work in progress, three senior PMC scientists, Jim York, John Post and Peter Kingston, began evaluating proteomics companies and technologies that they believed could provide important growth potential for their business. They concluded that Canterbury Proteomics Limited of Australia provided the best fit with their existing business and began talks with CPL management about ways that they could work together. After several discussions, CPL proposed that Cambridge Labs invest in a new U.S.-based joint venture to conduct high throughput proteomic analysis in order to identify drug targets that could lead to important new discoveries.

Canterbury Proteomics Limited: Company Background

CPL was founded in 1999 by a group of scientists from Monash University in Australia, under the direction of biologist Dr. Lewis Edwards. In the 1980s, Edwards was involved in a biotechnology company that attempted to produce biological agents that could be used to treat parasitic infections. When the venture failed, Edwards joined Monash University as director of the Center for Biochemical Analysis. Established in 1992 with funding from the Australian government, the center's goal was to develop improved instruments for the analysis of proteins. Clark Wilson, a PhD student at the center, soon began investigating proteomics as a counterpart to genomics. Specifically, proteomics referred to the study of "the complete set of proteins encoded in a genome."²³ Edwards commented on the significance of that event:

When Clark Wilson presented his work at a conference in Italy in the fall of 1994, our intention was to draw attention to the need to focus on proteins as the functional molecules of biology. We did this at a time when much of the scientific world's attention was focusing on genomics. Of course, developers of drugs had always been interested in proteins as they are the major targets for new drugs.

In 1997, the center submitted a proposal to the Australian government for approximately \$44 million to expand the center. When the proposal was rejected, Edwards became concerned about his ability to retain skilled researchers at the center. Ultimately, his solution was to separate from the university and establish CPL as a privately-funded proteomics company. Initially five other scientists from the center joined Edwards, including Clark Wilson. The company later grew to more than 70 scientists and staff members, the majority of whom were PhDs.

After receiving a government grant for new technology start-ups and initial venture capital funding, CPL successfully solicited its first research contract from

²³"Prime Time for Proteomics," *Bio-IT World*, March 2002.

Dow AgroSciences.²⁴ At the time, Dow was eager to capitalize on improved agricultural products through genetic modification. Monsanto and others had already created crops that resisted disease, parasites and herbicides. However, Dow pulled out of the venture in 2001 on growing public opposition to genetically modified food.²⁵ The company then turned its attention to proteomics, improving on its existing technology to create a fully integrated protein analyser (see Exhibit 5).

The Proteomics Analyser was used to identify and analyse proteins as they are expressed from DNA. CPL partnered with several other companies, including IBM and Japan Biotech Corporation (JBC) to provide a complete product. IBM provided the information technology platform needed to store biological information in very large databases and compute the interrelationships between various protein components. Over a period of five years, proteomics research was expected to generate 1,000 times the data generated from genomics.²⁶ JBC was responsible for constructing much of the analyser system from specifications provided by CPL. The analyser would sell for as much as \$8 million for a complete unit. Canterbury Proteomics held more than 20 technology and process patents for components of the system, some of which were believed to provide the company with distinct competitive advantages (see Exhibit 6).

The Proposal

The senior PMC scientists, York, Post and Kingston, had been discussing the technology with CPL. They proposed to Henderson that if Cambridge Labs were to invest \$5 million for a 20 per cent share of a new U.S.-based proteomics venture, CPL would contribute the technology and expertise needed to bring products (i.e., biomarkers) to market. In return, Cambridge Labs would provide capital, industrial knowledge and client relationships. Henderson, who was by no means an expert in the field of proteomics, had to rely on the expertise of his scientists. However, he wondered whether the company was ready to enter into a joint venture so soon after the PMC acquisition.

“You know that every \$1 million in earnings equals one cent in earnings per share (EPS),” he explained.

If we end up writing off the goodwill on this investment, it will cost us five cents a share, and that is probably equivalent to about \$1 billion in market capitalization, because I’ll miss the numbers by five cents. For a company our size in this market, investing \$5

²⁴Initial funding included a \$2 million grant from the Australian government and \$10.2 million from private investors in exchange for 10 per cent of CPL’s equity.

²⁵For a complete discussion of the issue of genetically modified food, see Ivey cases *Monsanto Europe (A) & (B)*, Ivey #9B02A007 and 9B02A008, 2002.

²⁶“Venture Capital the Cool-headed Way,” *The Financial Times*, June 21, 2001.

million is very risky. Having said that, I rely on you guys to tell me if this is the right technology for us. Is this the best technology?

Without hesitation, York responded:

Absolutely! We have looked at other companies, such as BioRad, but frankly they are not very innovative. I may be wrong, but I think the folks at CPL have the best long-term vision of where this field is headed.

Kingston added:

I don't know about their business or their management abilities, but their technology is superb, absolutely superb. And their people are unsurpassed intellectually. In terms of integrated systems, CPL's technology is the best. What we don't want is to buy instruments from vendors that we have to piece together ourselves.

York rejoined:

My only concern is that CPL is a small entrepreneurial company. They are ambitious, but I am not sure that they have the business discipline to deliver a sophisticated system on the scale that we need. On the other hand, I am more confident knowing that they have strong partnerships with companies like IBM and Japan Biotech.

Henderson agreed that Cambridge Labs should meet with CPL to evaluate the opportunity for a joint venture. He first presented the plan to the board of directors, which gave its approval to begin negotiations. Two weeks later Edwards and some of his colleagues met with Henderson and the PMC team.

The Meeting

Edwards began with a presentation about CPL, its technology and the analyser platform.

He explained:

Our primary goal is to be a discovery company which develops new diagnostics and drug targets. We have a team of highly skilled problem-solvers and we expect to be amongst the first proteomics companies to provide valuable and interesting outcomes. Many of the best-selling drugs either act by targeting proteins or are proteins

themselves. In addition, many molecular markers of disease, which are also the basis of diagnostics, are proteins. The analyzer will automate much of the process of identifying potential targets. This will have major implications for pharmaceutical research and development.

Although the system was currently only able to process a few samples per hour, Edwards believed that it could be improved to a rate of 1,000/hour (the minimum effective rate needed for drug discovery) within a year. He continued:

Imagine the potential. This is an emerging technology that will result in lucrative deals for early entrants. For example, early entrants in the field of high throughput combinatorial chemistry and high throughput screening struck attractive intellectual property positions and royalty arrangements. The same is true for genomics companies like Celera and Millennium. If we sell a marker to a pharmaceutical company that eventually results in a drug worth \$1 billion in revenues, we stand to gain \$100 million in royalties. If you are willing to invest in our technology, eventually we think we can give you \$50 million a year in royalties.

Henderson was concerned about how Cambridge's clients would react to the idea of paying royalties:

Drug companies are already seeing their margins eroded by generic competition for many blockbuster drugs. They can ill afford to give away their intellectual property and downstream revenue.

He was interested in the technology however. He explained:

Most of our clients have begun their own proteomic programs and would probably be interested in outsourcing much of the routine lab work. But it's really proteomic fee-for-service analysis that we are interested in providing to pharmaceutical and biotech clients. They would be the ones looking at new targets. I think it could help them with their early screening, but it's really the service, as opposed to the product, that we're interested in.

Henderson knew that most pharmaceutical companies had already announced proteomics programs in one form or other, and that the total proteomics market was estimated to be more than \$2 billion in 2002, growing to \$6 billion in 2005. Laboratory services had the potential to eventually win as much as 20 per cent of that business.

Henderson adjourned the meeting for lunch, giving both sides an opportunity to consider and discuss the morning's issues amongst themselves. Shortly afterward, he confided in his team that he didn't think the two companies were compatible:

I really have a hard time understanding Edwards. Forgive me for saying this, but he is too much of an academic. This is a university spin-off company. That doesn't necessarily make them great businessmen. Are they going to meet deadlines? They have a great concept in theory, but as they are talking about all this cutting-edge technology, all I can think about is deadlines and deliverables.

Expertise Versus Capital

After lunch, the two sides reconvened. Henderson began:

One of my big concerns is whether you will be around to support this venture. You're not a public company, so I can't see your financial records. It doesn't seem like you have raised any capital. If I put \$5 million into this venture, what happens if you go away next year?

Edwards was sure that CPL could raise the capital they would need. "We are going to raise \$15 million from one investor, and possibly another \$5 million from another."

Henderson asked, "Have you raised any money recently?"

Edwards replied, "Well, not yet. This is a tough market to raise capital in. However, we have some very strong partners in IBM and Japan Biotech. They wouldn't have partnered with us if they didn't believe in our long-term potential."

Anne Chifley, head of Discovery Programs for CPL, interrupted the conversation to suggest that CPL's business model had the best long-term potential. She explained:

If we discover biomarkers through this joint venture, that is IP (Intellectual Property). It is *our* biologists, *our* scientists coupled with pharmaceutical companies and other partners who are discovering these biomarkers. We believe that pharmaceutical companies will want to partner with us because this is not an easy field to get into. It is a very difficult space to work in and you really have to understand what you're doing. The timing to capitalize on proteomics is extremely ripe right now.

Henderson was unconvinced. He countered:

Pfizer has 5,000 scientists searching for targets, while the joint venture would initially only have five. Cambridge Labs has never sought to earn royalties in any of its businesses and I doubt that we would be willing to diverge from our business model.

My biggest concern, however, is whether this will really work, because if it doesn't I'll miss my quarter. How is this going to impact my financial statements, if it doesn't work?

"So what if you miss the quarter," Edwards retorted. "This will work; it is just a matter of time."

Henderson explained:

You don't understand, I have to show a 20 per cent margin in the first quarter. No place in the world is like the U.S. with our focus on quarter to quarter results. Unfortunately, in American business the focus is on what this will do to my financial statements right now, not three years from now.

Edwards was adamant. "That's so short-sighted. It's going to work. Either you're in or you're out."

Henderson explained that much more had to be done before a decision could be made. For one, Cambridge Labs had to be sure that the technology did not infringe on any existing patents. Within 10 days, CPL had to prove that it owned the patent rights for the Proteomics Analyser system.

"We won't get sued. And if we do, we'll stop," they replied.

Being a lawyer, Henderson knew all too well the pitfalls that CPL's approach implied. The United States was a much more litigious country than Australia, and any patent infringement damages under American law could prove costly.

After the meeting, Henderson asked his team for alternatives.

Post suggested, "We could go ahead with the joint venture, but until their technology is proven to work, I don't see any reason to pay goodwill on the IP."

Kingston responded:

We could buy a Proteomics Analyser system for between \$8 and \$10 million and do it ourselves. However, there are several

problems with that approach. First, we don't know if the system will actually work. We also will probably not be able to get fee-for-service exclusivity if we go that route. And finally, we don't have the same level of expertise in proteomics that they have.

York sat back in his chair with a facetious look on his face. "Or we could buy their company!"

"I *hate* that idea!" exclaimed Henderson. Everyone laughed.

Although he still had doubts in the back of his mind, Henderson was comforted by CPL's strong external partnerships. Therefore, at the next board of directors meeting he sought approval to enter into a joint venture with CPL under the following conditions:

1. The joint venture would provide proteomics testing and analysis on a fee for service basis to pharmaceutical and biotechnology clients.
2. Cambridge Labs would purchase 80 per cent of the shares for \$4 million and CPL would purchase 20 per cent for \$1 million.
3. The joint venture would be prohibited from pursuing drug discovery and development, but CPL could still pursue drug discovery outside of the joint venture.
4. The joint venture would have exclusive worldwide rights (with the exception of Japan where CPL already had assigned rights to its Japanese partner) to any proteomics services using CPL technology.
5. CPL would have the right to sell their systems to pharmaceutical companies that wanted to do their own, in-house proteomics services. However, these services could not be offered by the purchaser to other customers or spun off into a stand-alone company to provide services for a fee.

The Offer

Later that month Henderson again met with the CPL team to present his offer. Prior to the meeting, Kingston expressed concern.

I don't know how Edwards is going to react to our proposal, but I know that most companies would probably drop it and walk away.

Nevertheless, Henderson felt strongly that both parties brought equally valuable resources to the deal. Therefore, the equity stake of each partner should reflect its financial contribution.

When Kingston presented the terms of the deal to CPL, they were stunned. Did Cambridge Labs not value the technology, patents, and unique expertise that it

would bring to the joint venture? Not only did Canterbury Proteomics own the intellectual property and patents that were the basis for the venture, it had the technical expertise that would allow Cambridge Labs to access this emerging scientific field. In addition, CPL brought valuable partners, such as IBM and Japan Biotech. One employee of Japan Biotech had even won a Nobel Prize for his work on protein analysis. With its assembled expertise, finding valuable drug targets would only be a matter of time.

Kingston explained:

Proteomics Analyser is a new and unproven technology. Cambridge, because of its brand, has access to a lot of customers that, frankly, you will have a hard time getting through the door with. These relationships, along with our reputation as a premier quality service provider, have created a powerful brand image in the industry.

Edwards was incredulous:

Our scientific staff alone, along with the Proteomics Analyser technology platform could potentially find several important drug targets. This will be worth hundreds of millions of dollars in royalty fees to be shared between the partners. By the third year of the venture the two companies will likely be sharing millions of dollars in revenue. Royalties clearly offer the greatest long-term payoff.

To prove Edwards' point, the CPL team produced a spreadsheet showing annual projected earnings from royalties.

Henderson conceded:

I don't doubt your projections, but we don't want to charge our customers royalties. We want to say to anybody that is interested in this technology, "Come and get it. Just pay us X number of dollars per sample." With more and more samples, we can drive the cost per sample down.

On the other hand, if you go off and do a deal with somebody and take a royalty, typically those people are going to say, "Well, you're not going to be able to do for somebody else what you did for us. We're paying you five per cent of the drug revenue, so you can't do the same for our competitors."

Beyond that, charging royalties is inconsistent with Cambridge's reputation in the pre-clinical industry. We don't take intellectual property positions with customers.

Finally, Henderson raised the issue of providing options to the PMC scientists who would manage the joint venture. They also wanted the right to spin off the joint venture through an IPO that would also grant them founders' shares. "These people will be critical to the joint venture," Henderson explained. "If they were to leave, the joint venture would be finished."

At first, the CPL team did not seem to understand what Henderson was saying. By Australian standards, the management team would be earning very lucrative salaries. Now they wanted shares in the company! For Edwards, this was the final straw. He suggested that if Cambridge Labs could not present more reasonable terms, CPL would have no choice but to look for another partner.

Henderson replied:

Try raising \$5 million in venture capital in the current market. I think you will find it very difficult. It is a very tough environment for people to write big checks.

Exhibit 1

**CAMBRIDGE LABORATORIES
INCOME STATEMENT
(for years ending December 31)
(\$000s)**

Period Ending	2001	2000	1999
Total Revenue	\$ 465,630,000	\$ 306,585,000	\$ 219,276,000
Cost Of Revenue	<u>(298,379,000)</u>	<u>(186,654,000)</u>	<u>(134,592,000)</u>
Gross Profit	<u>\$ 167,251,000</u>	<u>\$ 119,931,000</u>	<u>\$ 84,684,000</u>
Operating Expenses			
Selling General And Administrative Expenses	(68,315,000)	(51,204,000)	(39,765,000)
Other Operating Expenses	(8,653,000)	(3,666,000)	(1,956,000)
Operating Income	90,283,000	65,061,000	42,963,000
Total Other Income And Expenses Net	2,465,000	1,715,000	489,000
Earnings Before Interest And Taxes	92,748,000	66,776,000	43,452,000
Interest Expense	(22,797,000)	(40,691,000)	(12,789,000)
Income Before Tax	69,951,000	26,085,000	30,663,000
Income Tax Expense	(27,095,000)	(7,837,000)	(15,561,000)
Minority Interest	(2,206,000)	(1,396,000)	(22,000)
Net Income From Continuing Operations	<u>\$ 40,650,000</u>	<u>\$ 16,852,000</u>	<u>\$ 15,080,000</u>
Nonrecurring Events			
Extraordinary Items	<u>(5,243,000)</u>	<u>(28,076,000)</u>	<u>2,044,000</u>
Net Income	<u>\$ 35,407,000</u>	<u>\$ (11,224,000)</u>	<u>\$ 17,124,000</u>

Exhibit 2

CAMBRIDGE LABORATORIES
CASH FLOW STATEMENT
(for years ending December 31)
(\$000s)

Period Ending	2001	2000	1999
Net Income	\$ 35,407	\$ (11,224)	\$ 17,124
Cash Flow Operating Activities			
Depreciation	<u>28,578</u>	<u>25,370</u>	<u>15,643</u>
Adjustments To Net Income	<u>\$ 28,246</u>	<u>\$ 28,928</u>	<u>\$ 7,723</u>
Changes in Operating Activities			
Changes In Accounts Receivables	(27,505)	(843)	5,346
Changes In Liabilities	13,227	(1,965)	(3,547)
Changes In Inventories	(3,762)	(2,343)	133
Changes In Other Operating Activities	<u>(2,893)</u>	<u>(4,155)</u>	<u>(4,854)</u>
Cash Flows From Operating Activities	\$ 71,298	\$ 33,768	\$ 37,568
Cash Flow Investing Activities			
Capital Expenditures	(36,406)	(15,565)	(12,951)
Other Cash Flows From Investing Activities	<u>(55,515)</u>	<u>989</u>	<u>(21,217)</u>
Cash Flows From Investing Activities	\$ (91,921)	\$ (14,576)	\$ (34,168)
Cash Flow Financing Activities			
Dividends Paid	(729)	-	-
Sale Purchase Of Stock	118,954	235,964	102,993
Net Borrowings	(70,995)	(235,182)	323,086
Other Cash Flows From Financing Activities	-	-	(437,583)
Cash Flows From Financing Activities	<u>47,230</u>	<u>782</u>	<u>(11,504)</u>
Effect Of Exchange Rate	<u>\$ (1,465)</u>	<u>\$ (1,855)</u>	<u>\$ (1,697)</u>
Change In Cash And Cash Equivalents	<u>\$ 25,142</u>	<u>\$ 18,119</u>	<u>\$ (9,801)</u>

Exhibit 3

CAMBRIDGE LABORATORIES
Balance Sheet
(for years ending December 31)

Period Ending	2001	2000	1999
Current Assets			
Cash and Cash Equivalents	\$ 58,271	\$ 33,129	\$ 15,010
Net Receivables	107,179	48,087	38,158
Inventory	39,056	33,890	30,534
Other Current Assets	<u>5,648</u>	<u>4,631</u>	<u>6,371</u>
Total Current Assets	<u>210,154</u>	<u>119,737</u>	<u>90,073</u>
Long-term Assets			
Long-term Investments	3,002	2,442	21,722
Property Plant And Equipment	155,919	117,001	85,413
Goodwill	90,374,000	41,893	36,958
Other Assets	18,673	16,529	13,315
Deferred Long-term Asset Charges	<u>93,240</u>	<u>113,006</u>	<u>115,575</u>
Total Assets	571,362	410,608	363,056
Current Liabilities			
Payables And Accrued Expenses	75,389	58,685	58,550
Short-term And Current Long-term Debt	933	412	3,543
Other Current Liabilities	22,210	5,223	7,643
Total Current Liabilities	98,532	64,320	69,736
Long-term Debt	155,867	202,500	382,501
Other Liabilities	14,465	13,531	2,469
Deferred Long-term Liability Charges	-	-	4,990
Minority Interest	<u>12,988</u>	<u>13,330</u>	<u>304</u>
Total Liabilities	281,852	293,681	460,000
Stockholders' Equity			
Redeemable Preferred Stock	-	-	13,198
Common Stock*	442	359	198
Retained Earnings	(283,168)	(318,575)	(307,351)
Capital Surplus	588,909	451,404	20,694
Other Stockholders' Equity	<u>(16,673)</u>	<u>(16,261)</u>	<u>(9,929)</u>
Total Stockholders' Equity	<u>289,510</u>	<u>116,927</u>	<u>(110,142)</u>
Net Tangible Assets	<u>\$ 199,136</u>	<u>\$ 75,034</u>	<u>\$ (147,100)</u>

* Outstanding shares numbered approximately 46 million.

Exhibit 4**OTHER SERVICES OFFERED BY CAMBRIDGE LABORATORIES**

Pharmacokinetic and Metabolic Analysis conducted pharmacokinetic studies to determine the mechanisms by which drugs function in mammalian systems to produce therapeutic effects, as well as to understand how drugs may produce undesirable or toxic effects. Metabolic studies also revealed how drugs are broken down and excreted, and the duration that drugs or their byproducts remain in various organs and tissues. These studies were often performed as part of the drug screening process to help identify lead compounds, as well as later in the development process to provide information regarding safety and efficacy.

Bioanalytical Chemistry Services supported all phases of drug development from discovery to non-clinical studies and clinical trials. Researchers designed and conducted projects, developed and validated methods used to analyse samples, conducted protein studies and performed dose formulation analysis.

Pharmacologic Surgery studied drugs designed to be administered directly to a precise location within the body using surgical techniques. The development of these and certain other drugs required the use of surgical techniques to administer a drug, or to observe its effects in various tissues.

Specialty Toxicology Services were undertaken by a team of scientists that included toxicologists, pathologists and regulatory specialists who designed and performed highly specialized studies to evaluate the safety and toxicity of new pharmaceutical compounds and materials used in medical devices.

Medical Device Testing provided a wide variety of medical device testing required by the Federal Drug Administration (FDA) prior to the introduction of new materials. Cambridge Labs maintained state-of-the-art surgical suites where custom surgery protocols were implemented on behalf of medical device customers.

Pathology Services identified and characterized pathologic changes within tissues and cells as part of the determination of the safety of new compounds.

Biotech Safety Testing determined if human protein drug candidates were free of residual biological materials. The bulk of this testing work was required by the FDA before new drugs could be approved. As more biotechnology drug candidates entered development, Cambridge expected demand for these services to increase.

Biopharmaceutical Production Services maintained production facilities for the development and manufacture of drugs in small quantities for clinical trials.

Exhibit 5

CANTERBURY PROTEOMICS PRESS RELEASE

Product news
received on 5 June 2002
from Canterbury Proteomics Ltd.

Next generation proteomics platform

Combination of separation technology, robotics, mass spectrometry and enterprise level computing delivers "comprehensive outcomes" through its ability to decipher proteomic complexity

Canterbury Proteomics has announced the release of the Proteomics Analyser, an integrated comprehensive solution designed to accelerate proteomics research and the discovery of new drugs to treat diseases such as cancer, infectious diseases and others.

The analyser brings together niche sample preparation and analytical technologies with enterprise level computing and extensive training and support programmes to offer an end-to-end solution for proteomics research.

Clark Wilson, executive vice president of bioinformatics, said: "We have created the analyser from the ground up for proteomics, combining the latest proteomics technology into one seamless platform. The combination of separation technology, robotics, mass spectrometry and enterprise level computing is unique to the analyser, which delivers comprehensive outcomes through its ability to decipher proteomic complexity."

Alliances with key partners such as IBM, Japan Biotech, Millipore, Sigma-Aldrich, and ThermoFinnigan enabled Canterbury Proteomics to accelerate the development of the Protein Analyser.

Lewis Edwards, CEO, Canterbury Proteomics said "The analyser will revolutionise and accelerate research in the pharmaceutical and biotechnology sectors, through its broad application in the discovery of diagnostic and prognostic markers, and an ability to identify and validate drug targets.

"Our technology has been developed by practitioners of proteomics, specifically for proteome research, and has been rigorously tested in our in-house projects in cystic fibrosis, cancer, infectious diseases and aging. Our ability to test our approaches in demanding in-house discovery programmes sets us apart from other vendors of proteomic technology," he said.

The Proteomics Analyser includes patented technology for protein separation, analysis and informatics, which together delivers faster, more reproducible results.

This empowers researchers to focus on their discovery outcomes while the analyser produces data and assembles it into useful biological information.

The Proteomics Analyser is integrated via a sophisticated informatics package that controls laboratory instrumentation and centralises all research outcomes into an IBM DB2 database software hosted on IBM eServer pSeries systems.

The software provides sophisticated analysis tools that allow information and projects to be shared between sites.

Mike Svinte, vice president of worldwide business development for IBM Life Sciences said: "Canterbury Proteomics has delivered a powerful solution for rapidly deciphering complex protein data.

The Proteomics Analyser brings together leading edge technologies, including an information technology infrastructure based on IBM eServer and DB2 data management systems, that will support proteomic research today and scale to meet future requirements."

Exhibit 6**PATENTS AND PATENT APPLICATIONS
RELATED TO THE PROTEOMICS ANALYSER SYSTEM****Electrophoresis**

- Electrophoresis Apparatus Method (pending)
- Cassette for Electrophoresis (pending)
- Increased Solubilisation of Hydrophobic Proteins (pending)
- Improved Gel for Electrophoresis (pending)
- Immobilized Enzyme Reactor
 - US patent 5,834,272 and Italian patent M195A0113
 - CPL has agreed to purchase the above patents from a consultant.
- Multi-Compartment Electrophoresis (pending)
- Improved Electrolyser (pending)
- Coated Hydrophobic Membranes for Electrophoresis Applications (pending)
- Electrophoretic Apparatus (pending)
- Electrophoresis Apparatus Incorporating Multi-Channel Power Supply (pending)
- Electrophoresis System (pending)
- Electrophoresis Platform (pending)

Image Analysis

- Imaging Means for Excision Apparatus (pending)
- Analyzing Spots in a 2-D Array (pending)
- Method for Locating the Edge of an Object (pending)
- Methods for Excising Spots from a Gel Under White Light (pending)
- Method for Locating the Coordinates of an Object on a Flat Bed Scanner or the Like (pending)

Protein Processing

- Liquid Handling Means for Excision Apparatus (pending)
- CPL and Japan Biotech are joint owners/applicants
- Sample Collection and Preparation Apparatus (pending)
- CPL and Japan Biotech are joint owners

Bioinformatics

- Method and System for Picking Peaks for Mass Spectra (pending)
- Annotation of Genome Sequences (pending)