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TENEX GREENHOUSE VENTURES

THE DILEMMA

At 6 o'clock in the evening on June 14, 2002 Frank Ruderman, CEO and co-founder of Tenex Greenhouse Ventures, was on the phone with Dr. Brady Samuelson, the CEO and founder of CardioFib, a start-up medical device company. Ruderman and Samuelson had met on several occasions over the past two weeks to discuss a potential investment in CardioFib from the Greenhouse. The conversation this evening was planned to hammer out the "nuts and bolts" of a relationship between CardioFib and the Greenhouse.

Neither a traditional venture capital firm, nor an old-fashioned angel group, the Greenhouse was a hybrid fund focusing on early stage life science-related companies. The Greenhouse offered its portfolio companies first round venture financing, access to a group of investors with deep industry experience and the willingness to work closely with growing companies, and future financing relationships for follow-on venture funding (if companies met their milestones). In return, the Greenhouse had high expectations of performance and participation from its investments. Ruderman had set aside time this evening to explain the relationship the Greenhouse might have with CardioFib and its management. If the fund decided to make an investment, he wanted to be sure Samuelson and his team knew what to expect.

HISTORY

Frank Ruderman's career as a venture capitalist was the culmination of decades of experience in the medical and business worlds. He grew up in Wakefield, Massachusetts, and studied Biology at Tufts University, with the expectation that he would become a physician. After graduating from Tufts, and not yet ready to attend medical school, he applied to a number of graduate biology programs. While Ruderman was completing his master's degree in Vascular Physiology at Boston University, his advisor suggested that although he certainly could complete his Ph.D. work, he might want to consider a career in the business of biology rather than biological

Research Associate Janet Feldstein prepared this case under the supervision of John Glynn, Lecturer in Business, Stanford University Graduate School of Business, as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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research. To “buy time” while he considered his options, he took a job teaching math and biology, as well as coaching basketball, at a local business-focused junior college. Through his teaching position at the junior college, Ruderman recalled, “I met a lot of folks who told me that I was unique among research scientists. My personality was more sales and marketing than research. They suggested I consider business school.” Ruderman applied to, and was accepted at, Dartmouth College’s Tuck Business School. Reflecting back on the path that took him from potential physician to future businessman, Ruderman recalled, “I was just sort of following my nose. It is indicative of what I have continued to do since. I surround myself with good people, people who have my best interests at heart, and who can give me a read on myself.”

After graduating from Tuck in 1972, Ruderman took the first of several positions in “the corporate world”, where he would spend the next ten years working with a variety of life science-focused corporations in various sales and marketing and general management functions. (See exhibit 1 for a brief professional bio.) In 1981, he took his first early stage CEO position which launched a career in his own words, of being “a serial and serious entrepreneur.” Even with a number of entrepreneurial experiences under his belt, until 1996 he never experienced a company “cash out.” Then within one year, four of his companies had liquidity events. In February 1997 after selling and transitioning Genomix, a functional genomics company founded at Genentech, to Beckman-Coulter, he officially retired for a while. “I bought a boat and decided to take it easy. I didn’t know what to do, so I started angel investing to redeploy some of my resources.” His “informal” angel investing eventually led to the creation of Tenex Medical Investors (see below). About a year later, he was recruited to be CEO of Berkeley HeartLab, which eventually became a Tenex Medical portfolio company. As Ruderman put it, “Before long, I was fully employed again.”

Tenex Medical Investors

After about a year of investing independently, in 1998 Ruderman participated in the founding of Tenex Medical Investors (Tenex), a forum for angels who had relevant life science experience and interest in investing in emerging life sciences companies. The concept of angels working together in a group had first arisen in 1995 when Hans Severiens and other Bay Area angels formed the Band of Angels, an angel investing network focused primarily on high tech companies. The Band of Angels worked with companies from a number of high tech industry segments, providing them with seed capital, as well as mentorship, guidance, and oversight¹.

Frank Ruderman and Tenex co-founders Alfred Mandel and Paul Quadros posited that an angel group with a vertically-focused membership on life sciences and an exclusive investment focus would have advantages over a generalist group like the Band. The deep industry expertise of its members would differentiate Tenex from other angel groups and VC firms. Furthermore, it would give portfolio companies access to what Ruderman described as “intellectual capital”, the relevant and meaningful guidance of a larger pool of angels.

¹ The founders of the Band of Angels had observed that private investing was becoming increasingly time-consuming and challenging. Identifying opportunities, screening potential investments and pulling together financing was possible for one investor acting alone, but was easier for several investors acting together. Several case studies address concepts in angel investing, including GSB Industry Note e-127 “Angel Investing” and HBS case 0-898-188 “The Band of Angels”.

Tenex' founders brought together over 125 other highly experienced technical and managerial professionals from the life sciences field. They established a headquarters for the group in Burlingame, California (now shared with the Tenex Greenhouse Ventures fund.) Tenex' founders established Tenex as a "non-profit forum for entrepreneurs and investors": entrepreneurs presented to Tenex members as a group, and then each angel made his or her investment decisions independently. The fund's role was to facilitate this dynamic and to enable the due diligence and investment processes. Any company that became part of the Tenex portfolio had access to the intellectual capital of the whole group and also to the Tenex facilities, when required. Frank Ruderman explained that Tenex succeeded as a non-profit, because providing portfolio companies with access to the Tenex intellectual capital results in better investment decisions and more opportunities for the Tenex angels: "The angels work with entrepreneurs and bring the entrepreneur expertise to the portfolio company, but this is more than just a free service. We expect a quid pro quo in access to deals. This is an economically driven operation."

In 1998, Tenex was contemplating an investment in a re-start of Berkeley HeartLab, a specialty reference laboratory that was repositioning and relaunching itself as a provider of advanced cardiovascular treatment informatics for secondary prevention and management of coronary artery disease. As a prerequisite to final investment interest from Tenex, the fund inserted Frank Ruderman as the relaunched company's CEO. With his career of managing life science companies, and degrees in biology, vascular physiology, and management, Ruderman (like many other Tenex members) was an angel investor who had relevant experience and was prepared to take an active role with the company immediately. His first task was to "stabilize the ship and stop the bleeding," as he put it. He devised new revenue models for the company to pursue, and within less than four years tripled the number of customers and grew monthly revenue to over \$750,000, a greater than 5x growth rate from 1998. Ruderman explained that working so closely with portfolio companies was the essence of the angel's job: "With angel investing, you *have* to get personal. You go belly to belly and you go face to face with the investments. You get into it. You've got to smell it, and you've got to feel it." By 2001, Tenex had become the largest life-science angel investor network in the United States, with over 160 members. (See exhibit 2 for more details on Tenex Medical Investors.)

BUILDING THE GREENHOUSE

In 2000 and the first half of 2001, when a difficult and deteriorating economic environment presented new challenges for angels, as well as for professional investors, several members of Tenex, led by Frank Ruderman, teamed up to create a new investment vehicle. When the bubble burst on the dot.com economy in early 2000, Tenex's members began to speculate whether the group's angel investing model would still work in a deflated economy. Ruderman recalled:

Tenex was made up of high net worth individuals who had a lot of liquidity during the market's heyday. Angels were doing a huge number of deals and there was money available. That all stopped in 2000. The public market closed, and the liquidity of the high net worth guys dropped. Fewer deals were being done. We became much more pragmatic about where and how we wanted to invest. We still had high net worth guys who had resources and were interested in investing, but they were much more scrutinizing and far more deliberate in decision making.

Tenex' members were concerned about the state of the market for liquidity and the availability of sufficient follow-on capital at attractive step-up valuations. They were primarily aware that the new scarcity of capital increased the likelihood of being "washed out" of any early stage investment they did make. These angels recognized the possibility that they could make a considerable investment of time, money and effort in the early stage, only to have a "crunch-down"² round from a VC wash them out. Given these insights, Ruderman and his peers saw a "strategic imperative" to adjust their current model of angel investing. Ruderman listed the characteristics of the market climate that had signaled this need:

- Less predictability of cash availability
- Tighter funding market with greater scrutiny
- Heightened fear of "crunch-downs"
- Significantly fewer deals being done with more competition for the premier deals
- Investors' preference for co-investments and large consortiums to insure funding through subsequent rounds, if required
- Expectations of two or more rounds of financing with the initial funding

Hand in hand with this new climate was a set of demands that an investing vehicle would need to satisfy:

- Improved deal flow with focus on early stage life science deals
- Being prepared to put more than one round of funding in place
- Emotion/passion component still in place: availability of intellectual capital
- Knowledge of segment: to understand the problem and to impose an enlightened fatal flaws analysis
- Co-investing with other financial institutions
- Assisting entrepreneurs in future rounds with institutional funding

Ruderman and his colleagues believed that the answer was to create a new hybrid fund that would embody the best that Tenex already offered, along with the financial resources of at least one if not more than one venture financing institution. He and two fellow Tenex angels — Robert Leach and Paul Quadros — became the founders of Tenex Greenhouse Ventures LLC (the Greenhouse) along with Tim Mills Ph.D, a partner at Sanderling Venture Partners, which became one of the two founding venture financing institutions.

What had always set Tenex apart from other angel groups and VCs was its focus on life sciences and its members' deep experience in the sector. Their "narrow but deep" intellectual capital improved deal flow, allowed for extensive and rigorous due diligence, and provided support for portfolio companies. The Greenhouse's founders believed that reinforcing this with institutional-strength financial resources would allow them to continue to fund successful investing opportunities. Ruderman described the situation as they launched the Greenhouse, "We already had a path for feeding well-supported seed-round companies to institutional investors. The challenge was to institutionalize the approach, to establish a sustainable identity and to harness the intellectual capital." The founders brought together 70 fellow Tenex angels, and established affiliations with two institutions: Sanderling Venture Partners, a biomedical-focused venture firm, and Diaz & Altschul, a late stage healthcare investment firm.

² A "crunch down" or "down round" occurs when a company receives a lower valuation in a follow-on round than it did on a previous round. As a result, the equity of investors from previous rounds would lose value.

The founders dubbed the new fund the Greenhouse, because it was conceived as a venture capital fund that would “grow and nurture” its portfolio companies into successful life science businesses. In short, the Greenhouse would be more than just a financial investment fund. It would also reflect Tenex’ ability and willingness to leverage the knowledge and network of its members, and would draw on the financial resources of its professional investor partners. As Greenhouse president Robert Leach explained, “We capture as much of the knowledge of the Tenex angels as possible. We want to be known for providing superior returns to our investors by nurturing our portfolio companies with the vertical knowledge and networks represented by Tenex and our institutional investors.”

The Greenhouse planned to allocate the fund over three years, making about four investments per year. The group was willing to invest in companies at the seed, start-up, re-start, or spin-out stage. The average investment was \$1-1.25 million, which would support the company for 9-18 months with the expectation that professional investors such as the Greenhouse’s partners or other VCs or institutional investors would take follow-on rounds, when the company needed significantly less of the Tenex non-financial resources.

Though the Greenhouse was not an incubator, it did offer additional resources beyond those typical of traditional angel groups or VCs. For example, it gave portfolio companies access to sophisticated laboratories, including wet labs, and fully furnished office facilities at its Burlingame headquarters ‘innovation center’. The Greenhouse also offered consultative management talent and administrative support for its portfolio companies. Members of the Greenhouse would actively work with management to hone business and organizational strategies, to recruit outside business and technology management, and to set up operations. In return for its investment of these non-financial resources, the Greenhouse viewed itself as a participating partner and expected a percentage, dependent on the extent of resources used, of founder’s common shares of company equity and at least one seat on the Board.

Ruderman and his co-founders selected established institutional investors with biomedical expertise and focus for partnership in the Greenhouse as a means to increase investing capital. The partnership with institutional investors strengthened the Greenhouse’s unique ability to identify and support the best start-ups in the life sciences sector. All of the Greenhouse members’ existing relationships, networks and knowledge would give them unparalleled access to opportunities and the ability to support and strengthen these companies. In addition, early stage opportunities that came to Sanderling or Diaz & Altschul could be redirected to Greenhouse. The relationship with institutional investors would also serve as a key marketing point for the Greenhouse in attracting the best investment opportunities. As Ruderman explained, “We want the entrepreneur to say, ‘Hey, I want to deal with *these* angels. They will work with me. They can get their hands dirty now, and they have back-end protection.’” The fund expected that entrepreneurs would value the access to follow-on financing because it would relieve them of the stress and time-demands of fundraising, and allow them to concentrate on the immediate challenge of growing the company.

Sanderling and Diaz & Altschul were eager to join the Greenhouse because it offered them interest in, and access to, pre-screened opportunities that would be supported and well-nurtured in the early stage by the Greenhouse. Sanderling had just raised a fund of over \$300 million, and

saw the Greenhouse as an innovative way to deploy some funds, while conserving its human resources. Diaz & Altschul was essentially a public hedge fund and saw its position with Greenhouse as a path to future private equity investing. In both cases, the firms saw the Tenex element as key to attracting and nurturing deals that larger funds could not easily work with. Fred Middleton, General Partner of Sanderling Ventures explained:

We were attracted to the Greenhouse because of the unique situation it presents of providing key physical infrastructure for companies when needed, and access to the experience of the Tenex Medical Investors. Through this combination, the Greenhouse brings technical, managerial, and strategic know-how directly to companies that can most benefit from these advantages, providing them with the critical resources they need to grow into successful life sciences companies.

Despite the founders' and partners' enthusiasm for the Greenhouse concept, the new fund received a lukewarm reception from its peers in the investing community. As Ruderman recalled, "The response was 'We don't see it.' They either didn't understand the concept of integration of angels and VCs or the uniqueness posed a competitive threat; regardless, initially there was not a lot of overwhelming support. But now, by 2002, one year after its inception, the naysayers are starting to go away." Ruderman credited the increasing respect for the Greenhouse concept to the venture community's pressing need for a new model:

This is more than an innovative approach to angel investing, it is an enabling approach to VC investing. How does a VC get access to early stage opportunities? How can he participate professionally in \$1-3 million financing deals that are likely to succeed, but need nurturing for 12 to 24 months? If he wants to put \$7-10 million to work, how does he do that within his present structure, without adding headcount or draining resources? The Greenhouse answers that question.

To illustrate the situation, Ruderman made a comparison, "We've sat in the church of early stage life science institutional private equity investing. We saw the pews that were available to us, but we couldn't see the altar from those pews. We didn't want to move out of the church, so we had to move the pews and rearrange the seating so everyone could see the stage."

LAUNCHING THE GREENHOUSE

In October 2001, Tenex Greenhouse Ventures announced the successful completion of its \$12 million fund-raising. Though it might have seemed counter-intuitive to rollout a new fund in the middle of a recession, The Greenhouse's founders believed that even in a difficult economic environment, they were well positioned to succeed. As Robert Leach commented in June 2002, "These will be challenging times for VCs and companies for at least the next six to nine months. But a new VC firm like the Greenhouse does not have prior investments to support and to distract it. We see this as an ideal time to launch a new fund." Furthermore, the market's new distaste for dot.com-era companies had not negatively impacted life science companies. As the Sorrento Valley Business News reported in November 2001, "In the year 2000, the phobia against investing in life sciences by the public and by the venture community fell away as the markets opened for a very healthy window of public financing... While the performance of the overall stock market has appeared weak, this appearance belies the reality of a great deal of

positive fundings taking place.” Also, as Ruderman explained, “The early stage life science space proved relatively immune to market vagaries, taking most of its value from technology enhancement, feasibility demonstration and market acceptance confirmation.” Nevertheless, the fund amended its initial plan to raise \$18 million, and closed at \$12 million. The founders decided to “seize the moment” with the funding available and move more quickly from the fundraising phase to the investing phase. The decision was motivated in part by the tight financial market, in addition to the group’s eagerness to prove the model. They knew that this could clearly be accomplished with \$12 million, laying the foundation for Greenhouse II.

THE INVESTMENT DECISION

In its first twelve months, the Greenhouse had reviewed over 225 business plans and was in the process of completing three financings. To-date in June 2002, it had been consistently able to follow its preferred pathway of milestone-based trenched investments of up to an aggregate total of \$1.25 million with a piece of the founder’s common equity for delivering the incremental non-financial value by being a participating partner. Ruderman expected that the fund was ready to make a decision on CardioFib within the week.

The Company

CardioFib was a cardiovascular medical device company that was developing a mapping technology for atrial fibrillation. (See exhibit 4 for more information on the company.) Dr. Brady Samuelson, a medical school professor and successful ‘serial entrepreneur, had developed CardioFib’s technology. He recognized the potential of the technology, and built an initial prototype with money raised from “friends and family.” With the company underway, Samuelson received \$350,000 from the Band of Angels in October 2001. Unfortunately, as Samuelson recalled, “The money had allowed us to begin to develop a new prototype, but was really not enough to establish ourselves. So we went out again to seek financing six months later.” The CardioFib team approached the Band as well as Tenex Medical Investors, but both angel groups passed on the deal. Frank Ruderman explained that the Band had decided not to invest because of its reticence to participate twice in a single deal; Tenex did not embrace the investment because it felt that Samuelson’s goals for the company were too broad. Furthermore, CardioFib had not reached a solid fundable benchmark with their initial seed financing. Two months into this financing activity and eight months after the first Band investment, CardioFib “resurfaced” at Sanderling. Ruderman recalled:

One of the Sanderling partners had segment expertise and took a new view on the business. He thought that CardioFib should drill down on just one of the company’s four goals. But CardioFib was still too early stage for Sanderling, primarily because it needed significant guidance to make this strategic transition. The partner called me to see if Tenex or the Greenhouse would be willing to consider the deal in a new light.

This time, Ruderman’s interest was piqued. In an initial conversation with Samuelson, Ruderman realized that the Greenhouse could be very attractive to CardioFib. “They had been talking with other people, but we differentiated ourselves quickly. We showed Samuelson that we know the segment better than most investors and that we have a vision for CardioFib’s future, and the ability to support the company in the present and in the future.” Ruderman explained

that an early stage company needs what the Greenhouse offered: "A lot of involvement from relevant intellectual capital, experienced supervision and a direct line towards follow-on funding." In fact, as Ruderman saw it, this set of needs was always present with early stage companies, and would always give the Greenhouse a competitive advantage over other funders. He explained, "We would always be the choice over an angel group or a VC firm, except when the entrepreneur really doesn't want someone working with him or if he can aggregate it himself due to prior successes." The real competition that the Greenhouse faced was with the entrepreneur's tendency to be "a control freak," and to resist the "interference" and involvement that the Greenhouse presented.

Ruderman was particularly eager to clarify these final issues with Samuelson. Some entrepreneurs often instinctively resisted the intrusion of a team of investors involving themselves closely with the management and development of the company. The Greenhouse's signature, however, was to work closely with the company and to provide it with the intellectual capital of its experienced members. Many entrepreneurs also resisted the milestone-based funding approach preferred by the Greenhouse. Would Samuelson do so as well, or would he welcome the insight and involvement from his investors and embrace the need to be accountable for achieving his plan?

In the case of CardioFib, Samuelson had embraced the idea of adding a new board member, but he had indicated a reluctance to accept an interim COO from the Greenhouse. As Ruderman explained,

He had established a set of milestones internally, and was working towards those goals. It's not that Samuelson is naïve or unqualified to lead the team. We simply believe that it is prudent for the Greenhouse to participate in deciding what is best for the company given its prior history. Had Samuelson considered fully whether he was the right person to lead the company? His initial hesitation to a new COO had given us pause. We wondered if he would be unable to relinquish any control at later junctures, even if it would add value. If you're going to put money into a new venture, then you really want to be able to *partner* with the entrepreneur, so that you can help him increase the probability of his success. Making major decisions is part of that partnership agreement. It sounds very basic. But it is really the most difficult concept for entrepreneurs to get into.

Ruderman pressed Samuelson on the management plan for the company. The Executive Summary did not offer insight to a management succession plan. Ruderman probed Samuelson on his current ability to lead, and his plan for the future. What was his view on succession and how would he enact his plan? Implicit in these discussions was his confidence and capability to achieve the stated milestones and ultimately his perceived value of the Greenhouse. Or was he just maneuvering for funding with minimal outside influence. Samuelson's reaction to a discussion of leadership played out Ruderman's concerns. "If we accept an investment from the Greenhouse, we ultimately embrace more interference from you and I'll have less control of CardioFib. I've put my heart and soul into making this company run for the past 30 months. Do I want someone else to be the one to take us over the finish line?" Ruderman responded with frank honesty:

It's true that you'll lose some control now. We are likely to hold you to greater accountability than other investors will. Our funding is based on milestones that we set together, and those aren't easy to achieve. You'll probably also be more diluted in this round than with another VC firm, but likely will need to spend less cash to achieve your goals. And it's possible that we will recommend that your management team is shored up with other experienced leaders. But keep in mind that we help you with the heavy lifting now so that later you will have a greater probability of achieving your dream. Everyone on our team has already walked this path that you are on — several times.

By the time Ruderman and Samuelson ended their conversation, it was after 9 o'clock. The pair had agreed to speak again on Monday, and to be prepared with a final decision on an investment agreement. If the Greenhouse decided to offer CardioFib an investment, Ruderman would also give the full details of its offer. Samuelson needed to be prepared to make his final decision on his flexibility and willingness to relinquish greater managerial and ownership control.

NEXT STEPS

After hanging up the phone, Ruderman lingered in the office to ponder whether to invest in CardioFib and what some of the larger implications were of this process and decision.

The company was intriguing, and he saw great potential in the device Samuelson had invented. But the decision to invest was not foregone in his mind. For example, he wondered whether CardioFib would be better off with or without the Greenhouse's involvement? Was the company at the right stage for working with the Greenhouse? How would Samuelson and his co-founders respond to the Greenhouse's policy of milestone-based investments? Was the current management team a good fit to work with the Greenhouse?

In the bigger picture from a motivational point of view, should the decision whether or not to invest be governed by the economic climate? Or by the development stage of the company? Did the Greenhouse have leverage for exacting better terms, given the current market and should they use it?

Even as he mulled over this investment decision he was also considering the "bigger picture" questions facing the Greenhouse. "We still have a number of outstanding questions for the future development of the Greenhouse. Are we playing our cards correctly?" For example, had the Greenhouse's founders made the right decision to close the fund at \$12 million? Did the size of the fund limit or lend itself to the type and size of investments the Greenhouse wanted to make? And how did it affect other aspects of the fund? The Greenhouse provided expensive office space and wet labs for its portfolio companies. Were they necessarily worthwhile? Did these facilities give the Greenhouse a competitive differentiation? Did they allow the fund to increase the probability of a company's success?

Yet another issue for the Greenhouse was visibility. As Ruderman mused, "Our deal flow is just starting to come into its own. People are starting to get to know us and think about us, and pitch to us. Are we ensuring that our visibility continues to grow? We've got four partners and only

\$12 million, so we can really only afford one full time partner. Finally, school's still out on the long term success and acceptance of our model. We believe – and our portfolio companies have agreed so far – that we can fairly expect a premium of common equity because of our intellectual capital. But the model has yet to play out fully.”

Ruderman checked his watch as he cleared off his desk to head home. It was 11:24 pm. In just over eight hours, he would call Samuelson, and let him know the Greenhouse's final decision for CardioFib.

Exhibit 1

Tenex Medical and Tenex-Greenhouse Founders Biographical Information

Frank R. Ruderman: Frank Ruderman has had a 30-year career as an operating executive in the life science industry and has been a life science industry entrepreneur for 20 of those years. Mr. Ruderman is the Chief Executive Officer, Chairman of the Board, and a Managing Partner of Tenex Greenhouse Ventures a new concept venture fund partnered with Sanderling Ventures. The fund integrates life science angel and venture capital financing, and nurtures early stage life science opportunities while leveraging the intellectual capital resident in the Tenex network. Mr. Ruderman is also the Chairman and CEO of Berkeley HeartLab and a founder of Tenex Medical Investors, a 140-member Bay Area network of angel investors formed in 1997 to fill a growing need for early stage investment and intellectual capital in emerging life science opportunities. Berkeley HeartLab is a cardiovascular informatics company with proprietary lipoprotein technology used for coronary artery disease risk assessment and monitoring of patient progress to personalized treatment plans. He served on the Board of Directors of Watergate Software, and was also a member of the Global Advisory Board of the Asian Business Association. Mr. Ruderman had been a consultant and a director of Genomix from its founding at Genentech with Human Genome Project funding, later acting as President/CEO and CFO. Genomix, a functional genomics hardware and reagent company, was sold to Beckman-Coulter in 1997. He founded and acted President, COO and a Director of Physiometrix, which went public at a \$60 million valuation. Mr. Ruderman also helped to found two additional medical device companies, Intella Interventional (private) and Cardiac Pathways (public at a \$200 million valuation) as spin-outs of Physiometrix. Mr. Ruderman served as a Board member, President, COO and CFO of American Bionetics, which saw revenue growth of 5x and its stock price increased to a high of 8x, the IPO price. The Company was sold to BioGenex after finalizing two acquisitions and completing joint ventures with Millipore and Dupont. He served as a member of the Board and the first President/CEO of Mast Immunosystems, which was sold to Hitachi. Before that, Mr. Ruderman served in various domestic and international corporate executive positions with Pfizer Pharmaceuticals, Pfizer Diagnostics and Millipore. Mr. Ruderman has an M.B.A. from the Amos Tuck School of Business at Dartmouth College, an M.A. in vascular physiology from Boston University, and a B.S. in biology from Tufts University.

Robert E. Leach: Robert Leach is the President, Chief Operating Officer, and a Managing Partner of Tenex Greenhouse Ventures. He is responsible for smooth running the Greenhouse fund, ensuring that deals are well represented and that there is sufficient deal flow. Mr. Leach served as Chairman and CEO of EPIcyte Pharmaceutical. He completed an angel financing followed by the Company's first venture capital round. He also completed a strategic alliance with Dow Chemical providing some \$50 Million of value to the Company. Mr. Leach founded CEO Consulting to assist biotechnology companies through transition, and typically would serve as an interim CEO. He initiated and completed the merger of two client companies. Mr. Leach was appointed Chief Operating Officer of CONNECT, the University of California San Diego's innovative program in Technology and Entrepreneurship. In this capacity he and the CONNECT staff worked with over 300 early stage high technology companies. Mr. Leach was formerly the President and Chief Executive Officer of Genencor International. Genencor is now number 2 in its industry with revenues of over \$300 million and 1300 employees, and has been sold to Eastman Kodak and Cultor Limited of Europe. Prior to Genecor, he worked at Corning Inc. Mr.

Leach has an M.B.A. from the Smeal College of Business at Pennsylvania State University and a B.S. from Pennsylvania State University.

Dr. Timothy Mills: Dr. Timothy Mills is a Managing Partner of Tenex Greenhouse Ventures. His focus is on selecting portfolio companies for which Sanderling might be interested in providing follow-on funding. With over fifteen years of experience in biomedical research and corporate management, Dr. Timothy Mills joined Sanderling as an Operating Partner and was subsequently promoted to General Partner. At Sanderling, Dr. Mills has focused on early stage investments in medical devices, biotherapeutics, and i-Health. He serves Sanderling portfolio companies as Director, Chief Executive Officer or management team member. Prior to joining Sanderling, Dr. Mills served as the Corporate Vice President of New Business Development and Chief Scientific Officer of Target Therapeutics, a medical device company that was acquired by Boston Scientific for \$1.2 billion. He also served as the Director for Prograft Medical, a Target affiliate. Prior to joining Target, Dr. Mills served as Director of Business Development and Advanced Research & Development in the Interventional Cardiology Division of Baxter Healthcare. Dr. Mills' academic appointments include service as the Director of the Artificial Heart Program at the University of California, Irvine Medical Center and membership in the University of California, San Francisco Radiology Department. Dr. Mills received his Ph.D. in Bioengineering from the University of California, Berkeley & San Francisco School of Medicine, his M.S. in Electrical Engineering & Computer Science from the University of California, Berkeley, and his B.S. in Electrical Engineering from the University of Colorado, Boulder.

Paul J. Quadros: Mr. Quadros is a Managing Partner of Tenex Greenhouse Ventures. He is responsible for the initial screening of business plans and concepts and manages the selection process. Mr. Quadros is a co-founder and Chairman of the Board of Genstar Therapeutics, Inc. (AMEX:GNT), a developer of gene therapies for the correction of genetic abnormalities, enhancement of standard therapies, and prevention of infectious diseases and TheraCyme, Inc. a developer of cell based therapies using its proprietary encapsulation technology. He served as President and CEO of GenStar through a milestone partnering agreement with Baxter Healthcare in 1998. Prior to founding GenStar in 1995, Mr. Quadros was a General Partner of Technology Funding, a venture capital management organization. Mr. Quadros was a member of Technology Funding's Commitments Committee from 1986 to 1994, serving as its Chairman from 1987-1990. From 1990-1994, Mr. Quadros served as Chairman of Technology Funding's Medical Investment Committee and was actively involved in managing Technology Funding's health care portfolio. Mr. Quadros is a founder, and former Chairman of the Board, of Cardiac Science (NASDAQ:DFIB), a developer of automatic external defibrillator (AED) devices and software. Mr. Quadros is a founder of Tenex Medical Investors, a life science angel investment organization. He is also a founder and director of NexCura, Inc. a patient decision support software tools company that markets corollary services to the pharmaceutical industry. Mr. Quadros holds a BA in Finance from California State University at Fullerton and a MBA from The Anderson School at UCLA.

Alfred J. Mandel: Mr. Mandel is a co-founder of Tenex Medical Investors and a member of the Operating Committee of Tenex Greenhouse. Mr. Mandel continues to run his own business development firm: 'Big Idea Group' (BIG). BIG focuses on helping emerging high technology companies penetrate the market and communicate their differentiating elements. BIG was started in 1995 after the sale of Redgate Communications Corp. Mr. Mandel had co-founded Redgate along with Ted Leonsis in 1986. Mr. Mandel met Ted while working at Apple Computer. Redgate grew to become a 120-employee marketing communications firm, and an industry leader in new media. Redgate was acquired by American Online in 1994. Ted Leonsis moved over as a President of AOL, and is now a vice Chairman of AOL Time Warner. In 1982 Apple Computer hired Mr. Mandel as their printer product manager. After introducing the Imagewriter, Mr. Mandel helped roll out both the Apple Lisa and Macintosh computers as Marcom manager in Apple's Macintosh Group. John Sculley then appointed him Apple's first event marketing manager. Mr. Mandel studied electronics and environmental sciences and holds an MA in Environmental Design from the University of Oregon's School of Architecture.

Exhibit 2

Tenex Medical Background Information

Tenex' mission is to provide a forum for private investors with life sciences expertise to meet entrepreneurs who had developed innovative concepts, procedures, products or services and who were seeking both advice and capital for early stage ventures in life sciences.

Though Tenex places no binding requirements on its members, on average, each angel is expected to invest \$75,000 annually. Most Tenex portfolio companies received \$250,000 to \$750,000 from five to ten investors. Crucially, Tenex always emphasized its intent to provide companies with more than just money; membership in the group implied the angel's willingness to network, and to assist portfolio companies and other members as necessary. Receiving any financial investment from Tenex meant that the entrepreneur would have access to the pooled intellectual capital of Tenex' membership, not just from the angels who made a financial investment.

Companies selected by the screening committee would present at one of seven dinners in a year. Interested members would then participate in subsequent formal due diligence sessions to further assess the investment potential. Since its founding in January, 1998 through December, 2001, Tenex has had 70 companies present with 54 of them receiving funding. These 54 companies have received a total of \$19.9 million from Tenex. In 2001, there were 182 Tenex members and three corporate sponsors; membership in 2002 has been reduced to 150.

Developing predictable avenues for next round financing for Tenex financed companies has also become an area of primary focus for the group. Starting in the second half of 2001, Tenex has gravitated toward co-investing with VCs or investing in companies that would achieve cash flow positive with the completion of the sought after financing. The earlier stage investing was addressed by the Greenhouse.

The Founders

The founders of Tenex are in aggregate representative of the diversity and breadth of the membership. They have substantial experience working with and/or in life sciences companies or in functions that are adjunct to the needs of life science companies such as database or informatics. Paul Quadros was the general partner in charge of life sciences at Technology Funding, where he directed numerous healthcare investments. Frank Ruderman is a senior executive who has been CEO and senior team member of several healthcare companies, including Berkeley HeartLab, Physiometrix, Genomyx and Mast Immunosystems. Alfred J. Mandel was a marketing executive for many years with Apple Computer and was a founder of Redgate Communications. He is now involved in high technology business development and investment banking. Mitch Stevko is a senior investment banker with Piper Jaffray and previously with Pacific Growth Equities; his clients have included include medical device, biotechnology, and healthcare information system companies.

Exhibit 3

Supplementary Information on Tenex Greenhouse

Tenex Greenhouse selects a small number of promising ventures that can benefit from the leverage of our support network, and then champions each, making available the critical resources necessary for success. Greenhouse advantages include:

Ready Access to a Wealth of Intellectual Capital: The Greenhouse brings technical, managerial and strategic know-how directly to young companies through our partners and our broad network of experienced scientific and managerial talent within Tenex Medical Investors, ensuring access to the resources essential for success.

Comprehensive Infrastructure Support: Tenex Greenhouse Ventures actively helps early stage companies develop business and organizational strategies, recruit senior business and technology management, establish corporate alliances, and establish operations. When needed, the Greenhouse can make available fully functional wet lab and office facilities at our Center for Life Science Innovation in Burlingame, California.

Funds Available for Follow-On Financing: Follow-on financing is available through our investment partners, including Sanderling Ventures and Diaz & Altschul, relieving young companies of the time consuming task of continuous fundraising, allowing a more concerted focus on achieving core business milestones.

Tenex Greenhouse seeks opportunities to which we can add both financial and intellectual capital to create a firm foundation upon which to grow. Our focus is the early stage, where many companies fail to realize their potential. As the name implies, the Greenhouse nurtures life science companies, adding value in the following stages of development.

- Seed: We cultivate new concepts and technologies from scientists and entrepreneurs, to build them into significant ventures. We invest and contribute to all aspects of the formation of the company.
- Start-up: We invigorate early stage companies where our skills can add significant value. We can be the lead investor or co-invest with private investors or venture firms.
- Spin-Out: We transplant products and technology pruned from larger corporations to form new enterprises.
- Re-Start: We re-pot and revitalize companies using our scientific and business skills to convert failures into successes.

Exhibit 4

CardioFib Executive Summary

Investment Opportunity

CardioFib is a medical device company developing proprietary non-invasive platform technology serving the multi-billion dollar cardiac rhythm management and interventional cardiology markets. The company's Origin System is used to perform an ElectroCardioScan™ (ECST™). An ECST™ precisely identifies the site(s) in the heart causing an abnormal rhythm (arrhythmia triggers), and also detects, localizes, and quantifies areas of cardiac tissue starved of oxygen due to an arterial blockage (ischemic zones). CardioFib's products are well positioned in today's reimbursement structure to enable cardiologists to treat more patients, guiding them to appropriate therapies sooner and more cost effectively than today.

Target Markets:

Atrial Fibrillation Market

Atrial fibrillation (AF) is the most common cardiac arrhythmia with an estimated existing US population of 2.7 million patients. New techniques for guiding therapeutic catheter ablation of AF are addressing previous physical and technical challenges associated with AF treatment, leading the market research firm Datamonitor to project a disposable market of over \$1 billion annually by 2005. At present, no effective enabling technology can quickly and noninvasively stratify the AF patient to an appropriate therapy, whether that therapy is medication, surgery, ablation or a pacemaker.

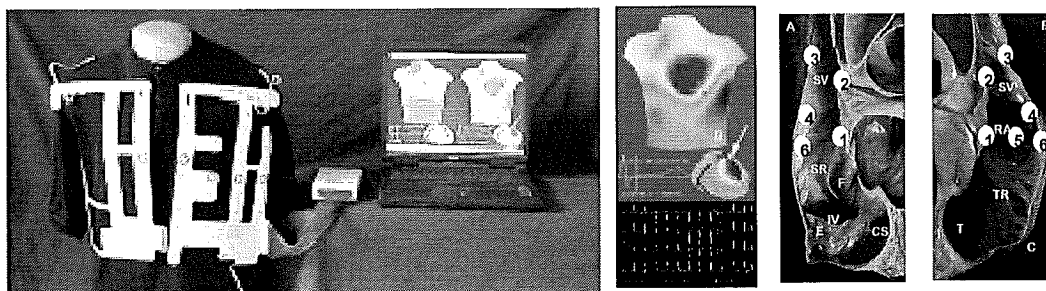
Ischemia Market

The CardioFib technology platform can address the ischemia market in the Emergency Room (ER) and in the Cardiac Stress Test Lab. There are 840 million ECGs performed annually in the US with 8 million for the sole complaint of chest pain in the ER. More than 20 million patients with chest pain are diagnosed in hospitals worldwide each year. Current technology allows early diagnosis for fewer than half of these patients. Approximately 1.5 million patients underwent cardiac stress testing last year in the US. According to studies recently cited in the New England Journal of Medicine, acute myocardial infarction or unstable angina is confirmed in only about one-third of chest-pain patients admitted for observation, delaying treatment and resulting in unnecessary hospital stays at an annual cost of \$5 billion. Based on these studies, it is also estimated that missed diagnoses of heart attacks result in the release of up to 160,000 Americans each year without required treatment, many of whom will subsequently die.

Clinical Opportunity

Atrial fibrillation can be treated in the EP lab using catheter ablation after intensive catheter mapping has identified the target site. However, catheter mapping is not only invasive but also difficult and time consuming because AF occurs erratically and cannot be induced effectively. These difficulties restrict the number of AF patients referred to and treated in the EP lab, resulting in lost revenue for the hospital and cardiologist. The market needs a noninvasive mapping tool to appropriately direct AF patients to ablative therapy, and an efficient therapeutic guiding tool to shorten procedures and improve clinical success rates.

Figure 1. Origin™ System: ECST™ Panels, Amplifier and PC; Ischemia and Atrial ElectroCardioScans™



AF Solution - OriginEP™ System

The OriginEP™ system is a 510(k) class II medical device used to perform an ElectroCardioScan™ by simultaneously recording 65 surface ECGs from proprietary disposable, multi-electrode panels (ECST™) worn by the patient. The peel-and-stick ECST™ panels are fitted to the patient by a trained nurse and can be applied more rapidly and consistently than the conventional 12-lead ECG. The OriginEP™ system acquires more than five times the amount of electrical information obtained with a standard 12-lead ECG. The system uses proprietary software and databases to non-invasively identify target areas for therapeutic catheter ablation. It needs to analyze only a single triggering heartbeat to produce 3-dimensional color maps of the heart and can be updated in real time. Unlike conventional invasive mapping systems, it is used as an initial mapping tool to screen patients and localize arrhythmias in the office or outpatient clinic before the patient is brought into the EP lab (e.g. while at home or in the office or outpatient clinic). The system is used again in the EP lab to guide where to apply therapy during the ablation procedure. The OriginEP™ system will:

- Increase the number of AF and other cardiac arrhythmia patients who may benefit from ablative therapy
- Improve AF ablation success rates by identifying focal triggers within as well as outside the pulmonary veins.
- Reduce AF ablation procedure times from greater than 6 to less than 2 hours by performing most of the time consuming mapping procedure outside the EP lab
- Save procedure costs by reducing procedure time and decreasing the number of expensive mapping catheters used
- Increase the profitability of the hospital by utilizing the EP lab more frequently and more efficiently
- Enable the cardiologist to earn more money by performing more AF ablations in a given time

These benefits will establish AF ablation as the first therapy option, grow the AF market by enabling cardiac electrophysiologists to perform more ablation procedures, make the procedure more profitable for the hospital by reducing material cost, and improve the standard of patient care while saving money.

Ischemia Solution – OriginER™ System

Like the OriginEP™ system, the OriginER™ system simultaneously records 65 ECGs from the entire torso using peel-and-stick ECST™ panels. The system uses proprietary software to noninvasively detect, localize and quantify ischemia zones and presents the findings in 3-D color anatomical images of the heart. The OriginER™ system has immediate utility in the ER and Cardiac Stress Test Lab. In the ER, the system enables the busy ER physician to triage patients presenting with chest pain to a therapeutic procedure such as thrombolytic therapy or coronary intervention (PTCA, Stent). In the Cardiac Stress Test Lab, the system has superior sensitivity and specificity in detecting ischemia (coronary artery disease) compared to the 12-lead. By performing a pre- and post- therapy ECST™, physicians can also use the OriginER™ system to assess therapy efficacy (thrombolytics or interventional procedures). As an integral part of chest-pain assessment, the OriginER™ system will:

- Detect, localize and quantify ischemia and myocardial infarction immediately reducing time to treatment
- Reduce cost by eliminating erroneous (often life threatening) patient discharges and the need for expensive but precautionary or “rule-out” hospital admissions.

These benefits will maximize the number of presenting ischemia patients that are correctly diagnosed for interventional therapy procedures and immediately expand the markets for all ischemia therapies including interventional products such as angioplasty catheters and stents, as well as thrombolytics such as tPA and streptokinase.

Ambulatory Solution – OriginHome™

Like the OriginEP™ system, the OriginHome™ system will be used to identify arrhythmia triggers, but will be wearable by the patient with a belt pack that attaches to the ECS™ panels. The patient can then be monitored while at home or work to capture clinically relevant arrhythmia or ischemia occurrences. The data obtained by the OriginHome™ system will be transferred to the OriginEP™ or the OriginER™ system for analysis.

Business Model

CardioFib will remain highly focused to first establish the OriginEP™ system as the industry-standard platform technology in the AF market by serving as the catalyst for therapeutic AF ablation procedures. The company will then target the ischemia opportunity and introduce the OriginER™ system into the ER and Cardiac Stress Test Lab. CardioFib will establish the ElectroCardioScan™ as the new starting point for all cardiac ischemia evaluation, challenging today's ischemia detection paradigm, with the ultimate goal of replacing the standard 12-lead ECG. The company will generate revenue through recurring sales of high-margin disposable electrode panels, supported by an installed base of low-priced systems. This is a proven and common model in the medical device industry as well as with hospitals and cardiologists.

CardioFib Founder

Brady Samuelson, MD, BSME / President and Chief Executive Officer / Director
Dr. Samuelson has helped raise over \$60M in venture financing and helped grow four startup healthcare companies, of which three have experienced IPOs including HeartShot Technologies (acquired by Boston Scientific) and Ventrica, Inc. where he was co-founder, Vice President of Marketing and Business Development as well as Chief Technical Officer. He was VP of Marketing at MedicLab through the IPO which raised \$101 million. He holds numerous patents in cardiology and has launched cardiovascular products worldwide.

Current Achievements

CardioFib incorporated in California and raised \$1 million in seed funding. With these funds, the company has increased its value by hiring the CEO, filing 6 US and 5 International patent applications on the key technologies, securing exclusive license and distribution agreements, assembling a scientific advisory board, prototyping and testing the disposable ECS™ panels and hardware system and conducting a clinical feasibility study to validate the technology.

Investment Opportunity and Financial Summary

The company is currently raising \$8 million in a Series A Financing with \$0.5 million committed from existing seed investors. Funds will be used to obtain regulatory approvals (US and Europe) for the OriginEP™ and OriginER™ systems, to conduct clinical marketing and reimbursement studies. The company expects to raise an additional \$15 to 25 million in financing to launch its products and achieve profitability. First sales are anticipated in the second half of 2003, and break-even is expected to occur in 2004.

<i>Financial Summary</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>
<i>Headcount</i>	14	33	85	141	178
<i>Sales (\$ millions)</i>	0	2.2	17.4	47.3	103.1
<i>Expenses (\$ millions)</i>	2.8	5.7	10.6	20.2	25.2
<i>EBITDA (\$ millions)</i>	(2.8)	(4.6)	1.2	15.0	55.0



STANFORD

GRADUATE SCHOOL OF BUSINESS

STUDY QUESTION#: E-126SQ
DECEMBER 6, 2002

TENEX-GREENHOUSE VENTURES STUDY QUESTIONS

STUDY QUESTIONS

1. Consider the model presented by Tenex-Greenhouse. Why (or why not) would you participate in the Greenhouse? Given individual partner economics, why would each participant become a limited partner in this fund? How can the participants involved economically justify it? Address the question from the point of view of:
 - a. The entrepreneur
 - b. The Tenex angel
 - c. An institutional partner (both pension fund and VC)
2. Comment on the following questions regarding Tenex-Greenhouse:
 - a. Is the Greenhouse's approach in front of, coincident with or behind a dominant emerging trend in venture capital? What is that trend? Where should Greenhouse want to be? Is this unique to life sciences; is it unique to early stage life sciences?
 - b. What is the Greenhouse's "ideal deal" given its resources and competitive positioning or advantage?
 - c. Why have a corporate Board in addition to General Partners?
 - d. Will a 4-year fund concept work? How best to view it? Where potentially is the 4-year life going to have its greatest negative impact?
3. Consider the potential deal between CardioFib and the Greenhouse. Comment on the issues and concerns both sides have raised. What other issues should they discuss? If you were Dr. Brady Samuelson, would you pursue/accept an investment from the Greenhouse? If you were Frank Ruderman would you proceed with an offer? What

Research Associate Janet Feldstein prepared these questions under the supervision of John Glynn, Lecturer in Business, Stanford University Graduate School of Business, as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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factors drive your decision? From Samuelson's and Ruderman's perspective what terms and conditions would be most essential? Are there any for each of them that are "non-negotiable"?

4. Would you, as a recent graduate of the GSB want to become a managing partner in the Greenhouse rather than in a large, traditional VC firm? Why or why not? Compare the job descriptions for each position. Would you accept a position as a venture associate or junior partner with the Greenhouse, before you accepted the same position with a traditional venture capital firm?