

## Berkeley Lab And Symyx Technologies: A Winning Combination

Lawrence Berkeley Natl Lab



With its unique approach to materials identification and analysis, Symyx Technologies is helping powerhouse companies worldwide blaze new trails in the realm of research and development.

Take one brilliant idea, a supportive national laboratory and a savvy technology transfer office, and occasionally the combination will hit the jackpot. It's all quite fitting given that the essence of this story is a technology based on the concept of combinations. The key elements, when brought together, resulted in the company Symyx Technologies, Inc., which today generates over \$100 million in sales annually.

Symyx was sparked by the innovative research of renowned scientist Peter G. Schultz, Ph.D., who began his career studying DNA, catalytic antibodies and other biological molecules. Professor Schultz was intrigued by the concept that manipulating antibodies in different combinations yielded an exponentially higher number of biological products, thereby opening the door to broader testing for immune-related drugs. As a chemistry professor and principal investigator at the Lawrence Berkeley National Laboratory in Berkeley, Calif., back in the 1990s, he applied the same approach to the growing field of materials sciences.

While conventional materials development involved creating new materials one at a time, and then painstakingly testing each one for desired qualities, analyzing combinations of materials promised to revolutionize the process. Professor Schultz and his colleagues at Berkeley Lab invented and reduced to practice a highly efficient and automated process, called high throughput, for simultaneously analyzing 10,000 different materials, or “combinatorial libraries.” Using the techniques of miniaturizing and simultaneous parallel processing, they designed a technology that allowed them to identify new materials with specific and desirable physical and chemical properties. These lead compounds were then analyzed and characterized to determine their structure.

“*The scientists achieved their goal of applying the concept of high throughput research to combinatorial chemistry, and applied it to the discovery of new materials – from magnets and super conductors, to catalysts and polymers. When they published this milestone in 1995, it warranted the cover story of the journal Science. That very same year Symyx was founded.*”

“It was a very broad concept with high risk that needed to be developed and commercialized within an entrepreneurial venture,” says Symyx President and CEO Isy Goldwasser. “That’s why Symyx was quickly founded to advance this technology.”

### **New Strategies for Successful Technology Transfer**

The partnership between Symyx and the Berkeley Lab Technology Transfer Department was somewhat unusual, but proved to be beneficial to both parties. According to Viviana Wolinsky, licensing manager at the Berkeley Lab, the SymyxBerkeley license transaction is believed to be the first of its kind whereby a national lab accepted partial payment in the form of equity. This arrangement allowed the startup company, based on the core intellectual property created at the Berkeley Lab, to devote more of its initial capital to developing the promising technology.

“As a Department of Energy lab, we’re always keen to make appropriate choices with licensing,” says Wolinsky. “We realized that Symyx had a great plan from the start — it made the right choices and has really gone far beyond initial plans.”

The original funding for the work was an \$80,000 grant to Professor Schultz for his research from Berkeley Lab’s Laboratory Directed Research and Development (LDRD) Program. The LDRD program is a source of discretionary funding that awards grants through a scientific and management peer review process for early-stage projects that are directed to the advanced study of hypotheses, concepts, or innovative approaches to scientific problems.

By 1998, Symyx had raised \$38.7 million from a variety of private and venture sources, including Alejandro Zaffaroni, Bayer INNOVATION, Chemical and Materials Enterprise Associates, Institutional Venture Partners (which is now Versant Ventures) and Venrock Associates. The company, headquartered in Santa Clara, Calif., went public in 1999 and is listed on NASDAQ.

Today Symyx is an impressive example of a federally funded technology that resulted in a vibrant and profitable startup, creating hundreds of high-value jobs. Symyx has more than 375 employees, the majority of whom are highlevel scientists and technical staff.

“We’re proud of this job creation, as well as other direct and indirect effects on economic development,” says Wolinsky. “Symyx has become a research powerhouse for other businesses both nationally and abroad.”

Symyx's performance continues to shine. Last year the company reached over \$108 million in revenue. Goldwasser says that as the first company worldwide to offer this technology, it has built a leadership role and therefore gains the most business and the most investments. Currently its equity is worth approximately \$750 million, a value that has benefited both the Berkeley Lab and other Symyx shareholders.

### **Impacting the Big Industries**

The list of materials and technologies that have emerged from the company's founding technology continues to grow, as does the list of pharmaceutical, chemical, energy and electronics companies that have benefited from Symyx Tools, Software and research services. Two of the company's more prestigious clients are ExxonMobil and Dow Chemical, and each has made a long-term commitment to change its organization to conduct research and development the way Symyx does, according to Goldwasser.

"Industry-leading companies like these don't usually seek help from outsiders, so it's been a big shift for them," he says. "This exemplifies how Symyx has changed an industry that is normally very resistant to change."

The materials that have been developed in the years since Symyx introduced its broad methodology include new polymers, chemical catalysts and specialty formulations. With over 320 issued patents, Symyx has the largest portfolio of any company devoted to high throughput materials discovery.

"Most technologies out of universities and national labs are very early stage technologies that need further nurturing and are not ready to jump out of the lab and into the marketplace," says Wolinsky. "But Symyx was able to take a very early stage technology, and a great concept, and exploit it to its fullest so that it's now providing huge value across an entire panoply of industrial sectors. It's very rewarding to see a licensee that has devoted its resources and creative energies so well."

Goldwasser, who began his involvement with Symyx as a summer student with Schultz, is perhaps most proud of the way in which Symyx is changing the field of materials sciences.

"We have been very profitable and very fast growing for a small company," he says. "What's most impressive for everyone is that we have really achieved what we initially defined as our overall vision — to change the way that research and development is conducted, by making it faster, better and more efficient."

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