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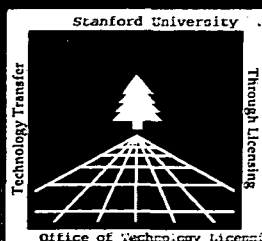
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Splices of Life and So Much More- A Retrospective of 25 years on Recombinant DNA Cloning, Biotechnology and Technology Transfer

It's become a story of mythical proportions in the biotechnology community. Two researchers meet on a tropical island and, during a nighttime snack, give birth to the basis for reproducing and cloning individual DNA segments. The punch line is that truth is stranger than fiction.

This tropical brainstorm, the Recombinant DNA Cloning technology, was produced by a collaboration between Dr. Stanley Cohen of Stanford University and Dr. Herbert Boyer of the University of California at San Francisco (UCSF) in 1973. Cohen and Boyer's invention laid the foundation of a new industry - biotechnology. But academics, industry and technology transfer offices also now view the Recombinant DNA Cloning technology as a direct and indirect aid in the promotion and progress of research and technology transfer.

Foundation of a New Industry

The consequences of Cohen and Boyer's discovery, from the early debates over the initial findings to the resulting patent process to the industry it engendered are dramatic in scope. Initially there were concerns over the freedom of researchers' works, questions about whether man-made living organisms should be patented, and safety issues stemming from the possible applications of Recombinant DNA Cloning (see "Tiger by the Tail," Niels Reimers, *Journal of the Association of University Technology Managers*, Volume VII, 1995).

In the early 1980's, biotechnology companies were just getting started as a viable group. Venture capital was also available, noted Jack Granowitz, Executive Director of Columbia Innovation Enterprise (Columbia University), and the venture capital firms were looking for something in which to invest their money.

These firms were eager to invest in innovative technology, and their initial investments paid off as the companies emerged as a new force in medical technology. As the biotech companies expanded, so did the need for leading edge technology.

The Rise of Technology Transfer

In 1981, Congress enacted the Bayh-Dole Act, allowing universities the right to license inventions created with government support without lengthy negotiations with each government agency. As a result of this Act and the interest in new ways to

acquire funding for academic research, university technology transfer offices started springing up all over the country.

"Academic researchers' attitudes 25 years ago were that patenting something, or giving a patent to industry, or developing a company of one's own, was selling out," commented Hugh McDevitt, Professor of Microbiology and Immunology at Stanford. "The major reason that attitude has changed...is the observation by the academic world that a patent accrues to the benefit of the university." And these benefits were allowed to occur due to the Bayh-Dole Act.

When the Recombinant DNA Cloning technology was invented, not only was a new industry created, but so was a new area of technology transfer. Biotechnology licensing accounted for over half of the licenses completed by Stanford's OTL in the 1996-1997 fiscal year.

Before Cohen-Boyer, non-profit technology transfer offices mainly focused on engineering, physics and chemistry. "The biologists and biomedical researchers needed to become acquainted with the value of technology transfer to the university and to the community in general," said McDevitt.

Technology transfer had remained somewhat unfamiliar to biologists because there were not many success stories or known advantages. "Cohen-Boyer came along as the first big commercial success [of university biotechnology transfer]," commented Ashley Stevens, Director of the Office of Technology Transfer at Boston University.

"As the new biotechnology companies started
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Glennia Campbell, Industrial Contracts Officer

by Kellyanne Ebisui

Glennia Campbell is the new Industrial Contracts Officer at OTL and Sponsored Projects Office (SPO). She can be found here fulfilling the University's contracting needs by negotiating sponsored research agreements with industry. Her liaison role between SPO and OTL further solidifies the working relationship between the two offices.

Glennia originates from Ohio, but was educated at Barnard College of Columbia University, receiving a B.A. in English. She continued her education to earn her J.D. from Northwestern University Law School. She is currently a member of both the New York and Texas Bars and recently passed the California Bar examination.

After law school, Glennia worked for the Bronx Legal Services, dealing with low-income clients in civil cases which included landlord-tenant disputes, civil rights and education issues. She then moved to Texas to work in the Contracts Department at Sematech.

While there, Glennia began doing project planning and contract management for the Lithography Group, specializing in Photomask development activities. She eventually became responsible for managing part of the Contracts Department and then transitioned to doing general corporate and contract law in Sematech's 3-attorney Law Department.

Only a few months new to both the Bay Area and the University setting, Glennia moved to the area as a result of KLA/Tencor's offer to her husband, Frank Schellenberg, for a position as Product Marketing Manager. In the relatively short time Glennia has been at Stanford, she finds she especially likes the people and the university environment.

She has learned a lot from both offices and enjoys the exposure to all of the different technologies. Because her position is newly created, she is continually redefining and learning new facets of her job. She says so far it has been pretty fun and exciting.

Glennia and Frank are avid travelers and have visited many countries, including an eight-country, around-the-world honeymoon. Her favorite countries include Japan, Korea (where she was born), and Italy.

Glennia is a very welcome addition to our offices, and we hope you will get

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a chance to work with her. She may even tell you some great stories about her travels. We hope, however, that no matter how far she travels, she has found a home in the Bay Area and with both SPO and OTL. ♪

Spices of Life...

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has lessened to a great extent, especially considering the number of start-up companies created by entrepreneurial faculty and students.

The End of an Era?

All three Cohen-Boyer patents expired December 2, 1997. OTL considers itself incredibly fortunate to have had such an opportunity to help establish biotech licensing as an important mechanism for technology transfer. Patenting the Cohen-Boyer invention "was a once in a lifetime situation that could easily have been overlooked," said Reimers.

"Cohen-Boyer, along with its tremendous success, has had an enormous public benefit," said Granowitz. "It was a win-win situation." While providing support to the same type of research that created the technology, the companies which licensed the technology from Stanford were able to generate products that benefited the entire world.

There is the well-known complaint that if biotechnology companies did not have to license the technologies from universities, the products would not be as expensive. "But did the biotechnology companies reduce their prices on December 3, 1997?" asked Stevens.

The Bayh-Dole Act was clearly the primary factor in facilitating technology transactions and increasing the number of university technology transfer offices. But the Cohen-Boyer invention helped promote technology transfer as a source of intellectual property available to industry and funding to support the research institutions. ♪

Many thanks to Glennia Campbell for her help editing this article. -KL



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