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UT SOUTHWESTERN'S EFFORTS IN PATENTING NEW DISCOVERIES AND LICENSING THEM TO PRIVATE ENTITIES IS CREATING A FIRM FOUNDATION TO LAUNCH AND SUPPORT BIOTECHNOLOGY COMPANIES.

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R. DENNIS STONE OPERATES AT THE CENTER of a whirlwind of researchers, venture capitalists, entrepreneurs and economic-development professionals. His job as vice president for technology development at The University of Texas Southwestern Medical Center at Dallas requires him to have a hand in every facet of technology licensing — identifying potentially marketable research, dealing with individuals who can finance and manage new companies, and working to make biotechnology a bigger part of the local economy by enlisting local support and recruiting experienced executives to the area.

A medical doctor and researcher who joined the UT Southwestern faculty in 1984, Stone now has responsibility for the medical center's efforts in patenting new discoveries and licensing or selling them to private entities that want to translate laboratory progress into marketable products and services.

"We are dedicating a lot of work to creating an infrastructure in Dallas to launch and support biotechnology companies," Stone said.

By Wayne Carter

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Dennis
Stone,
M.D.

Dallas Biomedical Corp. was founded in 1986 to create companies that would commercialize UT Southwestern research. With backing from local investors — including Dallas Semiconductor Corp. founder C. Vin Prothro, a longtime UT Southwestern supporter who died in 2001 — Dallas Biomedical achieved success as a technology incubator long before the term became a 1990s venture capital buzzword.

GeneScreen Inc., founded in 1988 as Dallas Biomedical's first venture, still is in business. The company, bought by Princeton, N.J.-based Orchid Biosciences early in 2002, provides paternity, forensic and bone-marrow testing services out of facilities in Dallas; Sacramento, Calif.; and Dayton, Ohio.

"GeneScreen was a clear success, and Dallas Biomedical was something that was clearly ahead of its time," Stone said.

Regardless of its early success, UT Southwestern officials weren't satisfied that the medical center was making the most of licensing opportunities. Annual licensing revenue never broke the \$1 million mark until 1992. Until 1998, the moderate annual growth trend continued, with licensing revenue reaching \$4 million that year. The licensing mechanism also was retooled in 1998 with the establishment of the Office of Technology Development and the naming of Stone as vice president.

By 2001 UT Southwestern was receiving more than \$10 million per year in licensing income.

"The revenue provided by technology licensing has become very substantial, and the Office of Technology Development has grown from six people at the start to 15 people now," said Stone, who holds the NCH Corporation Chair in Molecular Transport.

The opportunities are increasingly understood and appreciated by UT Southwestern researchers.

"Over the past three years, there has been a dramatic change in the emphasis on technology licensing and how things are conducted," said Dr. Stephen Johnston, director of UT Southwestern's Center for Biomedical Inventions. "We have focused on taking developments and translating them into useful, clinically viable stuff."

The Center for Biomedical Inventions (CBI) itself is a product of UT Southwestern's recognition of the importance of advancing science and doing so with an eye toward the practical application of new developments.

JOHNSTON IS ONE OF

four members of the CBI, established in 1997 to conduct research that would have immediate possibilities for commercial development. CBI work includes Johnston's development of a gene gun that delivers genetic vaccines by driving tiny gold pellets coated with DNA through the skin. Rather than conditioning immune-system responses to certain pathogens, the genetic vaccines are designed to alter cells at the molecular level. Those changes program the body to be able to respond appropriately to certain pathogens.

Johnston, holder of the Dr. Eugene Tragus Chair in Molecular Cardiology, is conducting research to develop genetic vaccines for bioterror agents such as anthrax and smallpox. That work has received ongoing funding from the Defense Advanced Research Projects Administration, and early developments already are in the hands of a private company.

MacroGenics Inc., based in Rockville, Md., and Seattle, is working to develop viable vaccines based on Johnston's work. The company has a development facility in Dallas as a result of its 2002 acquisition of Eliance Biotechnology Inc., a Dallas-based company that was founded specifically to translate Johnston's lab work to the commercial market.

Dr. Eric Olson, chairman of molecular biology at UT Southwestern, said the administrative infrastructure that supports technology transfer is vital to the process.

"Academic institutions and researchers are generally not familiar with individuals in private sector biotech business," Olson said. "It's hard to know how to get started; it's hard at first to see the complete financial picture, to know the difference between purely academic and commercial ideas."

Those comments are telling, coming from someone who has co-founded a company.

Olson helped put together Myogen Inc., a Denver-based company that specializes in developing and marketing cardiac drugs. Olson and colleagues founded the company shortly after his arrival at UT Southwestern in 1996. Myogen has licensed some of Olson's discoveries and provides some funding for his ongoing research. But even as a co-founder, Olson prefers to work at arm's length. The organizational separation gives a bit of breathing room between scientists working on new developments and business experts looking for new opportunities, said Olson, who directs the Nancy B. and Jake L. Hamon Center for Basic Research in Cancer and the Nearburg Family Center for Basic Research in Pediatric Oncology and holds the Robert A. Welch Distinguished Chair in Science.

Currently, the majority of biotech companies are located on the East and West coasts — which Stone and others in the Dallas area would like to change. Dallas is one of many municipalities nationwide working to siphon biotech talent and money away from centers like Boston; Washington, D.C.; and San Diego.

UT Southwestern has developed a strong partnership with StarTech Early Ventures, a small-business incubator based in Richardson, originally founded to support startups in that city's telecom corridor. StarTech, which invests in early-stage companies and provides expert counseling and executive talent, was an investor in Eliance and now holds a stake in MacroGenics.

But beyond StarTech, it's hard to find local capital and leadership for the kinds of companies that would buy UT Southwestern technology.

"There's a lack of biotech venture capital, whether it's seed funding or firms capable of doing large-round investments," Stone said. "And we don't yet have a pool of entrepreneurs with the credibility and exposure to attract East Coast and West Coast venture firms."

Dr. Harold "Skip" Garner, chairman of biomedical engineering and also a founding CBI member, agreed. He has found fertile ground for cultivating new scientific developments at UT Southwestern, but he admits missing his old stomping grounds when it comes to turning ideas over to the private sector.

"I came here from San Diego, where if you have a commercially viable idea, you can walk down the street and round up venture capital and a chief executive officer and a chief financial officer," said Garner, holder of the Philip O'Bryan Montgomery Jr., M.D., Distinguished Chair in Developmental Biology. "There are people working hard to change this, but Dallas has little history in biotech. Entrepreneurs and venture capitalists in Dallas traditionally have been focused on telecommunications and semiconductors."

Stone and others believe they are up to the challenge. Stone says he'd rather see companies starting up and staying in Dallas, but that trying to force the issue at the expense of getting deals done would be counterproductive. Rather than viewing Eliance's acquisition by an out-of-state company as a blow to the Dallas biotech scene, Stone points to the fact that the former Eliance operation still is fully intact in Dallas and has greater opportunity for growth through MacroGenics and its investors.



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Stephen
Johnston,
Ph.D.,
with his
gene gun

Stone said his office is close to finalizing a deal that would create a company to develop technology created by Dr. Jon Graff, associate professor in the Center for Developmental Biology and of molecular biology. Graff has developed a way to rapidly characterize cell-surface proteins that act as gateways to the cell for outside elements.

Understanding those proteins and how they work will allow development of drugs to attack diseases like cancer, in which

rogue cells proliferate.

But Stone and his colleagues have much more on their plates than just start-up companies. More than 70 technologies available for licensing are listed on the Office of Technology Development's World Wide Web site, and there are many more active licensing agreements that don't require the office's day-to-day attention.

Among those is a licensing agreement with San Antonio-based Mission Pharmacal Co., which manufactures an over-the-counter calcium supplement developed by Dr. Charles Pak, director of the Center for Mineral Metabolism and Clinical Research. Citrical is one of the most effective and widely recommended calcium supplements to halt the bone-ravaging effects of osteoporosis.

The list of available technologies constantly is in flux as new developments are patented and others fall behind due to lack of interest. It seems that fresh inventory is as important in the technology-licensing business as it is in the grocery business.

"We try to keep a viable portfolio," Stone said. "If we're unable to commercialize something, we will look at doing nonexclusive licensing or we will abandon the patent."

Perhaps the greatest challenge Stone and his staff now face is maintaining the momentum they have been able to generate in a very short time. New developments will continue to surface, and entrepreneurs and investors are always on the lookout for new opportunities. ❖

LICENSE TO HEAL

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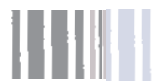
THE MOST IMPORTANT

thing is to do what's best for the company," Stone said. "I do believe that both would have thrived with corporate headquarters in Dallas, and hopefully the next company will stay here in its entirety."

That desire is important enough for Stone to make it a priority to try to help Dallas create a firm foundation for biotech. Thanks to the Office of Technology Development, UT Southwestern is active with the Greater Dallas Chamber of Commerce and the Dallas Plan's biotechnology initiative. The Dallas Plan is an independent, nonprofit group working with business and community leaders to plot the city's course in several strategic areas, one of which is real-estate development.

"There's a lack of laboratory space," Garner said. "You can find all kinds of space that's tailored for electronics or telecommunications but not for biomedical space."

The next company already is on the drawing board.



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