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Tucson, Arizona | Published: 09.09.2003

« back

Planting the seeds

Venture capital, business support, training needed to make tech bloom

By David Wichner and Inger Sandal ARIZONA DAILY STAR

(Third of Three Parts)

When Dr. Laurence Hurley came to the Arizona Cancer



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Center in 2000, he brought along his groundbreaking work in cancer therapy and a team of about 10 researchers.

What he didn't bring to Tucson from Texas was his fledgling drug development company, Cyternex Inc., which he established in San Diego instead.

"There was not a good infrastructure to support a biotech company in Tucson," Hurley said, citing lack of local investment capital and lab space.

As it builds research space and seeks

Bob Breault

Co-chairman of the Arizona Optics Industry Association and chairman of Tucson-based Breault Research Organization, on firms moving from California to Tucson

There's venture capital money that is here and can be attracted, but it's the seed capital that's the toughest to get. It doesn't pass the MBA test.

Dick Love

Chief operating officer of TGen

Engineers from the optical sciences have been doing technician work because there were no technicians. That's why there was a big cry for us to be doing this. You have to have the manpower to be able to serve these industries.

Lazaro Hong

Chairman of the technology department at Pima Community College's Desert Vista campus

**Arizona venture capital**

Venture capital investment in Arizona companies, in millions

1993	\$47.3
1994	35.6
1995	93.4
1996	94.6
1997	158.1
1998	210.5
1999	360.1
2000	679.0
2001	270.6
2002	208.5

Sources: MoneyTree Survey,

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more private support through endowments and commercial partners, the University of Arizona is getting serious in its effort to spin university research into high-tech, high-paying companies that could help Tucson transform its low-wage, service-dependent economy.

But business owners, researchers and university administrators say the effort could wither unless the local business community and investors step up to fill some gaps:

Employers working with the UA and Pima Community College to graduate students with the skills high-tech industries need.

Investors ponying up venture capital money to help tech companies form and grow.

Builders taking a risk by constructing expensive "wet lab" space with the equipment biotech companies need to work safely with liquids and gases.

PricewaterhouseCoopers, Thomson Venture Economics and the National Venture Capital Association

**About the writers**

Tech Transformation was reported and written by Star staff writers Inger Sandal and David Wichner.

Sandal, who works with the Star's Metro reporting staff, is the newspaper's higher education writer. A University of Arizona journalism graduate, she joined the Star in 1996 after working at The Tribune in Mesa.

Wichner covers optics and high technology on the Star Business staff. An Ohio University journalism graduate, Wichner came to the Star in 1997 after working with the Phoenix Gazette and The Arizona Republic.

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"It is a two-way street," said Bob Hagen, chairman of the Southern Arizona Tech Council. "I can't think of a high-tech community across the country that doesn't have very close ties with a research university."

Seeding startups

The funding pinch comes in two stages: Early "seed" money that university startups need to sprout, and big-dollar venture capital that can determine a company's success or failure.

Founders of local high-tech startups say they've had to dig into their own pockets to come up with initial capital.

"Every great success story that you've probably heard of, one way or another, had to use money out of their own pocket," said Louis Breton, co-founder and executive vice president of Tucson-based Cellz Direct Inc.

Cellz Direct, which supplies human and animal cells for biomedical research, got \$3.4 million in its first round of venture capital funding last fall, but not before pitching its business plan to numerous glassy-eyed investor groups.

"It was a trying time, and like most people will tell, it's been difficult to get funding here in Tucson and across the country," said Breton, who holds a bachelor's degree in molecular and cellular biology from the UA. "There's a lot of great technology that goes unfunded."

The new Governor's Council on Innovation and Technology is studying the challenge and is due to come up with proposals by the

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year's end, said Richard Powell, UA vice president for research and graduate studies and a member of the council. Possibilities include encouraging the creation of private seed funds through tax credits and government matching money.

The UA is working to provide money and space with a new high-tech business "incubator" at the UA Science and Technology Park, 9040 S. Rita Road. But it still needs the support of local businesses, said Bruce Wright, UA associate vice president for economic development and CEO of the Science and Technology Park.

The incubator, the Arizona Center for Innovation, was launched in June with 4,500 square feet of office space and 8,000 square feet of wet lab and laser lab space. It replaced the Tucson Technology Incubator Inc., which closed in January.

As of late 2002, the Tucson Technology Incubator had admitted about 16 companies that collectively raised \$3 million in capital and generated more than 40 new jobs.

The new center is designed to be more hands-on and more focused on high-tech businesses based on UA research, with a lineup of local business advisers who have agreed to offer services - legal and marketing, for example - at discount rates, Wright said. It opened with two clients, Arizona Microsystems Inc., which is developing UA technologies for optical material design, and Earth Knowledge LLC, an environmental consulting company founded by former research scientists with the U.S. Geological Survey. About 10 other companies are considering applying to become center clients, Wright said.

As the new incubator grows, Wright is looking for money to help

clients succeed. He needs "pre-seed" money to pay for studies that show an invention works as intended, and "early seed" money to help high-tech startups write business plans, develop products and cover expenses while they seek larger investments.

Wright said he's talking with a local private investor group, the Desert Angels, to help provide pre-seed funding. He's also talking with four local companies and investment groups to help provide part of the \$500,000 or so he figures the center needs each year to incubate 10 or 12 businesses over two- to three-year periods.

Jim Strickland, general partner in Coronado Venture Management, which manages several venture capital funds based in Tucson, has agreed to help the Arizona Center for Innovation by relocating his fund office there, lending advice to startup companies and possibly providing some seed money.

Getting seed money isn't easy, because savvy investors see startups as highly risky, said an executive of the Translational Genomics Research Institute in Phoenix, or TGen, who has raised startup capital.

"There's venture capital money that is here and can be attracted, but it's the seed capital that's the toughest to get," said Dick Love, chief operating officer of TGen, a Phoenix-based project that seeks to use human genetic data to prevent or cure diseases. "It doesn't pass the MBA test."

Other states, such as Oklahoma, have raised pools of seed money and used income tax credits to encourage so-called "angel investors" - wealthy individuals willing to risk money on local startups.

The city of Phoenix was recently awarded \$170 million in federal New Markets Tax Credits to aid investment in low-income areas over seven years, partly earmarked for biotech companies.

Tucson doesn't have such credits, though the city can offer tax breaks for development in certain areas.

"With these tax credits and other ways, we've got plenty of wealthy people in Arizona, so it's inducing them to invest in this fertile area," Love said.

#### Matching dollars

A state matching-funds program helped launch Ardext Inc., a Tucson software company spun off from research at the Georgia Institute of Technology.

Ardext's software for speeding up the testing of computer chips got help from the state's Yamacraw Seed Capital Fund, which helps telecommunications startups.

The fund, launched in 1999, provided \$250,000 in early seed money, matched by \$750,000 from private investors. In exchange, the state of Georgia has an ownership stake in the firm.

"Everybody's got skin in the game," said Ardext President and CEO Doug Goodman.

Arizona has a jump on Georgia in many areas, Goodman said. Its computer-chip manufacturing and design industry drew Ardext to the state.

The UA attracts and spends more in research money than Georgia Tech: In 2001, the UA pulled in \$370 million, compared with \$304 million for Georgia Tech, according to a survey by the Massachusetts Institute of Technology's Technology Review magazine.

But Georgia Tech reaped nearly \$4.7 million in gross licensing revenues in 2001, while the UA got only about \$834,000, the survey showed.

Venture vacuum

Facing huge costs for lab research and years-long clinical trials, tech companies - especially drug-development firms - need investors with deep pockets.

Few of them are in Arizona or investing in companies here.

Venture capital investment in Arizona companies - by in-state as well as out-of-state funds - fell to \$208 million in 2002, from \$270 million in 2001 and a high of \$679 million in 2001, according to the MoneyTree study by PricewaterhouseCoopers, Thomson Venture Economics and the National Venture Capital Association.

By contrast, venture capital investments in 2002 totaled more than \$1 billion in the San Diego area and \$5.2 billion in the San Jose, Calif., area.

Hurley launched Cyternex in San Diego because most of his investors were based in California. The company raised \$4 million in its first round of venture funding and is trying to raise \$25 million more. It's unlikely he'll find that here.

"For big bucks, you've got to go to California; you've got to go to the Bay area; you've got to go to Los Angeles," said Nasser Peyghambarian, chairman of laser and photonics at the UA Optical Sciences Center and founder and chairman of NP Photonics Inc.

Excluding corporate venture funds and smaller "angel" investor groups, Arizona has four institutional venture funds - Strickland's Coronado; Valley Ventures, which is based in Tucson and Scottsdale; Solstice Capital, based in Tucson and Boston; and Phoenix-based Grayhawk Venture Partners. In addition, Salt Lake City-based Wasatch Venture Fund has an office in Tempe.

The \$250 million to \$300 million available in Arizona venture funds is about 10 times the amount of local venture capital that existed here 10 years ago, said Larry Aldrich, a general partner in Valley Ventures.

While initial seed capital is scarce, Aldrich noted that Solstice and Tucson Ventures, which merged last year with Valley Ventures, ranked in the top 100 venture firms nationwide for early-stage deals in 2002, according to the MoneyTree survey.

Outside investment in the area may be on the rise. Many venture capital funds see potential in Tucson's growing tech industries, said Bob Breault, co-chairman of the Arizona Optics Industry Association and chairman of Tucson-based Breault Research Organization.

That has as much to do with problems in California as it does opportunities in Arizona, Breault said.

"They've got energy problems. They've got governance problems. If they are thinking about moving or expanding, Tucson is the place to

go."

Wet labs wanted

Raising money doesn't do high-tech companies much good if they don't have lab space to develop their products.

That space, especially the wet labs biotech companies need, is in short supply in Tucson. Its high cost - at least \$400 per square foot, compared with around \$180 per square foot for deluxe office space - keeps developers away, said Bob Davis, a vice president at CB Richard Ellis Tucson who specializes in industrial development.

Tucson officials last fall asked private developers to build basic wet lab space with a generic layout that could be modified to meet specific researchers' needs. Davis said no new wet lab space has been built for lease in the area since last fall.

When Hurley was unable to find local wet lab space for Cyternex, he tried to secure financing to build it. But bankers and contractors said they wanted repayment in two years to limit the builder's risk.

"That was going to make it much more expensive to do it here than in San Diego," Hurley said.

That city was overbuilt with lab space, making lease rates attractive, he added.

Davis expects new interest after the UA begins to build its Institute for Biomedical Science and Biotechnology and the new Medical Research Building north of the main campus.

"When the shovel goes into the ground, everything will come into

focus, and there will be more clarity on just what is needed," Davis said.

Current wet lab space at the UA Science and Technology Park is too far from campus to support biotech companies that want to partner with UA researchers, he said.

#### Training tech workers

As tech companies try to build Tucson's "knowledge-based" economy, they are helping to train the city's future work force.

High-tech companies are collaborating with Pima Community College to ensure graduates have the skills to qualify for jobs - jobs that offer starting salaries around \$40,000 in a community where annual pay averages \$31,000.

And through partnerships between business and the college, students are pursuing professional certificates in specialties that range from engineering and technology to health care and manufacturing. Pima also provides on-site training to businesses - including Raytheon Missile Systems, Tucson's largest private employer - and its Small Business Development Center helps existing and startup companies.

Such programs can assist workers throughout their careers because today, jobs evolve - whether you hold a doctorate or work in production, said Roy Flores, an economist and Pima College's chancellor.

"You have to keep retooling in order to keep current," Flores said.

Johnson Bia, dean of PCC's Workforce and Business Development,

said the college is always fine-tuning its programs to meet the needs of employers and students. People reach different goals all year long.

"We have a lot of small graduations going on throughout the year. That's when we know we are touching the lives of the students that come to us," Bia said.

David De Leon, one of nearly 300 Tucsonans who took part in Pima's GED high school equivalency graduation ceremony this summer, works in room service at a local resort. He received a scholarship to the college and plans to get a degree in computer engineering.

"That's what I love to do," De Leon said. "I wouldn't mind the money, either."

Pima College started training optics technicians at the urging of local companies, said Lazaro Hong, chairman of the technology department at Pima's Desert Vista campus.

"Engineers from the optical sciences have been doing technician work because there were no technicians. That's why there was a big cry for us to be doing this," Hong said. "You have to have the manpower to be able to serve these industries."

Fast-track certificate

Tucson's biggest biotech company, Ventana Medical Systems Inc., is among local companies working to support the high-tech worker pipeline at Pima.

Ventana, which makes automated microscope slide preparation equipment for pathologists, has committed more than \$100,000 in

equipment and supplies to a new Pima program in histology - the science of preparing microscope slides and samples for testing.

To answer the growing need for histology technicians, Pima created a fast-track "certificate for direct employment" for students with on-the-job experience, as well as a two-year associate's degree. The new program began this semester and filled up with 28 students.

In addition, 18 students a year will intern at Ventana, and the company will provide guest lecturers and on-site specialty classes for students, spokeswoman Kimberly Schmitz said.

Tucson-area hospitals with histology labs have also committed to training students and donating supplies.

Starting histologist salaries range from \$28,000 to \$33,000. With continued education, histotechnicians can become specialists, clinical lab supervisors, sales representatives and technical support personnel, Schmitz said.

Ventana also supports worker training with tuition reimbursement.

Ricardo Espinoza, a Ventana test technician who started as an assembly worker five years ago, makes about \$27,000 a year - about \$13 an hour - after five years with the company.

He plans to go to PCC to earn an associate degree in electrical engineering with the help of the company's tuition reimbursement program.

"I already talked to human resources, and they said we can work it out," said Espinoza, 34, a Nicaraguan immigrant who came to the

United States when he was 17.

The tech industry many hope will boost Tucson's future is attracting workers away from the industries that ruled its past.

Walter Bryant, 35, wanted to stay in Tucson after he got laid off from the mines for a second time. But he didn't want a service job or a position in the prison system, so he signed up for Pima's new optics program. The starting pay nearly matched that of the mines, and "Tucson was billing itself as Optics Valley."

Today he is one of about 18 future optics technicians in the program, which will graduate its first class in May. Bryant looks forward to having a degree that offers him opportunities in a growing industry.

"I hope it's a big future," he said.

Contact reporter David Wichner at 573-4181 or [wichner@azstarnet.com](mailto:wichner@azstarnet.com).

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