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Scientific grants, patents increase

But Ariz. ranking in middle for its biotech economy

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Arizona is collecting buckets of research dollars, generating scientific buzz and working on medical cures for diseases such as cancer and Alzheimer's.

Yet while making strides in developing a research-based economy, Arizona remains middle-of-the-pack compared to other states in two key measures: research grants and biotechnology patents.

Many say research dollars and innovation go hand in hand. The more the state's universities and companies take in, the more innovation, patents and disease cures will follow.

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"Research does turn into technology and products," said Walt Plosila, of Battelle Memorial Institute, the Columbus, Ohio-based non-profit group that researches biosciences. "We need to create a critical mass of research."

Arizona has taken aggressive steps over the past five years to bolster its position in the biosciences. The state has plowed more than \$1 billion in public money toward research since 2001, a big bet that the state hopes will yield high-wage jobs and a more diversified economy.

Is all that research paying off with innovation?

Patent data shows that Arizona has gained some ground. Arizona ranked No. 25 among all states in biotechnology-related patents issued in 2005, a slight bump from its No. 27 ranking in 2001, according to the U.S. Patent and Trademark Office.

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At the same time, Arizona's universities, schools and hospitals have secured more research- and health-related grants, money that proponents say will keep scientists busy making new discoveries. The National Institutes of Health gave \$175.9 million last year in research grants, fellowships and other awards to Arizona companies and groups. That represented a 50 percent jump from \$117.6 million awarded in 2001.

That money is being spent for research on everything from personalized cancer cures to nanotechnology. Many of these research projects will take years to develop from the lab to products that help ward off disease.

Still, Arizona invests just a fraction of the amount of biotech powerhouses such as California and Massachusetts, states with established research-based economies that far outpace Arizona in innovation, patents and high-wage sciences jobs.

For example, California last year took more than \$3.3 billion in government funds and secured more than 1,400 biotechnology-related patents. California charted its course three decades ago and has built well-established research universities, large tech companies and startups with an open spigot of venture capital.

What's more, states across the nation and other nations such as India and China are aggressively courting biosciences as a cure to the economy because of the promise of good-paying jobs. At least 40 states have some type of biosciences initiative. All the interest creates intense competition for the top-tier scientists and companies that ultimately make the discoveries leading to patents and products.

Economic development officials here say Arizona cannot expect to become a research hotbed overnight, nor should leaders expect to develop expertise in a broad array of science disciplines.

"If you look at most of those markets that are ahead of us, bioscience has been their focus," said Troy Ignelzi, vice president of emerging technologies for the Greater Phoenix Economic Council, the Valley's main economic-development arm. "This effort in Arizona began in the 2000-to-2001 timeframe. The thing Arizona has to recognize is patience."

Arizona seeks the most bang for its buck by narrowing its research to key areas as outlined in the state's Bioscience Roadmap, a 10-year plan to develop the state's biosciences efforts. The idea is to spend Arizona's limited research dollars wisely and develop expertise in a few key areas such as pharmaceuticals, hospitals and laboratories, research, testing and medical devices.

"It is a big investment," said Teree Wasley, director of Arizona State University's Technopolis, which offers education and other services for life sciences entrepreneurs. "We want to see more research, more patents and more university spinoff. Everybody is anxious for it to be ready tomorrow."

Arizona's universities are scrutinizing discoveries and research in an effort to stretch limited research dollars. The theory is by narrowing spending on a few discoveries with a better chance of hitting store shelves, taxpayers and universities will get more for their money.

A key gatekeeper in that process are the so-called "technology transfer" offices at universities that seek to turn discoveries into products that people can buy.

Arizona Technology Enterprises, the transfer arm of ASU and Northern Arizona University, attempts to nurture start-up companies and fund discoveries that have a good chance at succeeding in the market.

Because the patent process can be long and expensive, ASU is very selective about the technologies it seeks to patent, said Andrew Wooten, Arizona Technology Enterprises' vice president and managing director for life sciences.

"We're trying to be wiser about how we are spending the money," Wooten said. "You can't just patent everything that comes through the door."

Wooten said his agency helped obtain 22 biotechnology-related patents in fiscal 2006 compared to 15 the year before. He cites the tight spending approach as one factor for the increase.

A recent study by Santa Monica, Calif.-based Milken Institute suggests universities get a return of \$6 in licensing fees and other revenue for every \$1 invested in transfer arms.

It's unclear whether Arizona's narrow focus and tight spending will yield more patents, discoveries and start-ups. For one, the federal government has become much more stingy in how it issues biotechnology-related patents. The total number of such patents issued in Arizona, California and elsewhere has dropped since a peak in 2001 due to stricter standards, a backlog of applications and other factors, according to a patent and trademark office spokeswoman.

About five years ago, the feds typically approved 70 percent of all biotech-related patent applications. That number has dropped to about 58 percent.

"We've seen a bit of a downward tick in (approvals)," said Brigid Quinn, the agency's deputy director of public affairs. "That is across the board in biotech."

Despite the feds' tougher standards, experts say Arizona's patents remain an important measure of the state's bioscience efforts.

"Patents are a useful proxy to find out where your strengths are," Plosila said.

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