Economic Development Planning, Summary 21

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**Title:** Growing Southern Arizona’s Bioscience Sector: A Regional Roadmap

**Year:** 2006

**Source:** Battelle Technology Partnership Practice, of Columbus, Ohio

**Authors:** Battelle Technology Partnership Practice

**Prepared for:** Southern Arizona Leadership Council, with financial support provided by the Flinn Foundation

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**Website:** flinn.org or flinnscholars.org/file/regional_roadmap_full_526.pdf

**Summary:** Southern Arizona’s bioscience sector is young, but has experience rapid growth. Much of Arizona’s bioscience activity – industry base and research base – is located in this region. The University of Arizona is the key driver of bioscience research in the state, but it is still playing catch-up in the biosciences. The region is home to such well-established bioscience companies as MRI Medical Manufacturing and Research, SEBRA, Sonora Quest Labs, and Ventana Medical Systems, and has a strong track record of bioscience spin-offs from research. Five strategies and 17 actions are proposed to grow Southern Arizona’s bioscience sector over the next five years. The strategies include building a talent base and continuing to build a critical mass of bioscience firms.

**Sector:** Bioscience, including diagnostics, preventive medicine, agricultural feedstock and chemicals, drugs and pharmaceuticals, hospitals, medical devices and equipment.

**Geographic impact:** Southern Arizona
Key actors: University of Arizona, University Medical Center, Southern Arizona Leadership Council, Tucson Regional Economic Opportunities, Ventana Medical Systems, Sanofi US, Flinn Foundation, city of Tucson, University of Arizona Science and Technology Park, Arizona Cancer Center, Arizona Research Laboratories, Arizona Center for Innovation, MRI Medical Manufacturing and Research Inc., Desert Angels, Pima Community College, Science Foundation Arizona, SEBRA, Sonora Quest Labs, Bio5Institute, Critical Path Institute, UA Bioscience Park, Oro Valley Innovation Park, BIO5 Oro Valley, Bioscience Leadership Council of Southern Arizona and the Arizona Bioindustry Association.

Major challenges: Retaining faculty members at University of Arizona and continuing cutting-edge research is a challenge. The UA medical school is small. Not enough is being done to commercialize technology generated by UA. There is insufficient interaction between large and small bioscience companies and between companies and UA. There are concerns about the quality of K-12 education, particularly in STEM (Science, Technology, Engineering and Mathematics). There are insufficient sources of capital to support fledging companies.

Progress to date: In 2012, on the 10th anniversary of Arizona’s renewed commitment to bioscience, Battelle examined how much progress the state has made in bioscience. Among its findings: Greater Tucson’s research, testing and medical labs sector is well concentrated, nearly meeting the national average in employment. These key subsectors have added 18 establishments since 2002, bringing the total to 69. The job base has grown to 1,301 employees, a 39 percent increase. Tucson has a large and growing hospitals subsector with 15 institutions. Hospital employment is up 15 percent to 14,301 employees. Location quotient for research, testing and medical laboratories is 0.96. LQ for hospitals is 1.21.

More than 100 companies, institutes and research facilities are located in southern Arizona. The region is home to two global bioscience giants – Ventana Medical Systems (Roche) and Sanofi US. Other entities include Critical Path Institute, Bio5 Institute at UA, DxInsights, Syncardia, UA Tech Park, UA BioPark, Oro Valley Innovation Park, and BIO5 Oro Valleytech. In 2012, Denver-based Accelr8 Technology Corp. (now known as Accelerate Diagnostics), which makes systems to rapidly identify and classify bacterial infections, moved its headquarters to Tucson.

Major implications: Bioscience is an economic driver that offers Southern Arizona more stability and well-paying jobs, particularly in an economy that has been based on such traditional strengths as tourism, real estate, construction and hospitality. With the University of Arizona and its medical school, and a growing cluster of bioscience companies, Southern Arizona has an opportunity to leverage its research base to further build its bioscience sector.

Opportunities for alignment: The bioscience industry is one of the top areas for recruitment and retention of companies by Tucson Economic Regional Opportunities. With almost every region in the country targeting bioscience, the
best option for Southern Arizona is to zero in on areas of strength or the most promising areas rather than taking a broad approach. That has prompted TREO to identify the diagnostics industry, which generally involves diagnosing a patient’s disorder or disease as well as selecting the best therapy for a patient, as a priority for recruitment. TREO is in a position to connect industry, governments, nonprofits, economic development groups and higher education. The University of Arizona, including BIO5, Arizona Health Sciences Center and the Critical Path Institute offer companies an opportunity to collaborate on research. Other opportunities exist in Tucson institutions connecting with bioscience entities in greater Phoenix and San Diego, and working with Sonora to possibly set up lower-cost pharmaceutical manufacturing facilities in Sonora.

**Background**

In 2002, public and private leaders in Arizona made a commitment to position Arizona as a leading center for the biosciences. Since the publication of Arizona’s Bioscience Roadmap, significant progress has been made in creating an environment supportive of the biosciences in Arizona. Key to the effort is building infrastructure around selected technology platforms, growing a critical mass of bioscience firms, and fostering a business climate and environment supportive of the biosciences.

With this regional bioscience roadmap, which complements the statewide effort, attention is turned toward southern Arizona and the challenges and opportunities it faces in building its bioscience industry. The region accounts for a large share of Arizona’s overall bioscience sector, both its industry base and research base. Southern Arizona is home to the University of Arizona, the key driver of bioscience research in the state with a strong track record of bioscience spinoffs from its research. The region also has such well-established bioscience companies as MRI Medical Manufacturing and Research Inc., SEBRA, Sonora Quest Labs, and Ventana Medical Systems, and smaller, startup and emerging companies.

**Southern Arizona’s bioscience industry**

Much of Arizona’s bioscience activity takes place in Southern Arizona. The region’s bioscience sector is young, but has experienced rapid growth, adding nearly 1,000 jobs between 2001 and 2004, a 7.1 percent increase.

The region’s largest bioscience subsector is hospitals with nearly 13,000 employees, many working at the UA and the University Medical Center. The nonhospital sector is not big, but it’s growing rapidly. In 2004, it employed 2,000 people across 112 business firms. Nonhospital biosciences employment grew 21.9 percent between 2001 and 2004, compared with the national rate of 0.9 percent.

The research, testing, and medical laboratories subsector is the fastest growing and the largest among the nonhospital subsectors, employing 1,100 in Southern Arizona. The region added more than 300 jobs between 2001 and 2004, a 45.6 percent gain. In Battelle’s 2006 national report for the Biotechnology Industry Organization,
metropolitan Tucson ranked 28th among 72 large metropolitan areas based on its location quotient (LQ) of 1.07 in the research, testing, and medical laboratories subsector in 2004.

Manufacturers of medical devices, supplies and instruments have a significant presence in southern Arizona, employing more than 800.

The bioscience industry provides well-paying jobs. In 2004, the average bioscience worker in Southern Arizona earned $40,004, which is 22 percent more ($7,227) than the $32,777 the average private sector worker took home.

**Situational assessment**
Southern Arizona has an emerging industrial base and a strong research base on which to build its bioscience economy. Competitive advantages include the University of Arizona (research and development, students and graduates, a highly rated entrepreneurship program), a core base of bioscience start-ups and established companies, an attractive quality of life, and an entrepreneurial environment. Challenges include retaining faculty members and continuing cutting-edge research, a small medical school, not doing enough to commercialize technology generated by UA, insufficient interaction between large and small bioscience companies and between companies and UA, perception of quality of K-12 education, and insufficient sources of capital.

**Strategies and actions**
Southern Arizona’s bioscience industry is growing, but it is still small. The region needs to leverage its assets – its base of talent, research and core of bioscience companies – to grow further and achieve a critical mass of bioscience firms. Strategies over the next five years include:

- Build research strengths around bioscience technology platforms. Three technology platforms – molecular targeted therapeutics and diagnostics, preventive medicine and insect sciences – are viewed as particularly suited to southern Arizona’s research core competencies.

- Build a critical mass of bioscience firms by expanding technology commercialization at UA, increasing industry partnerships with UA, C-Path, and others, and increase access to specialized facilities and labs at UA.

- Build the talent base by forming an executive-in-residence program and expanding career pathway opportunities for bioscience careers.

- Maintain a business climate supportive of the biosciences by addressing the shortage of risk capital, selectively recruiting bioscience firms and ensuring supportive tax and regulatory policies.