2005 PROGRESS ON ARIZONA'S BIOSCIENCE ROADMAP

Moving Forward

A PUBLICATION OF THE FLINN FOUNDATION

Mileposts Ahead

Three years into a 10-year plan to bring Arizona to national competitiveness in the biosciences, the payoff of initial investments is beginning to show. Federal grants are accelerating. Grand opening ceremonies continue statewide. The tech sector scores a major victory in the Legislature. Venture capital is getting in gear. Major bioscience and tech firms are setting up shop in Arizona.

The year 2005 also marked the expansion of *Arizona's Bioscience Roadmap*. The Steering Committee grew to more than 60 statewide leaders representing academia, business, and policy. The number of committees of statewide experts increased to 16, covering scientific disciplines, capital formation, communications, and workforce and education.

What's key in 2006?

Translational Research: Arizona has the right ingredients to be a national pacesetter in this important field that aims to get discoveries from lab to patient more quickly and effectively. A plan for this new component of the *Roadmap* will be unveiled.

Capital Formation: Arizona must generate additional revenue streams, both private and public, to recruit and retain top scientists. Boosting venture capital and especially early-stage seed funding is a must. A research and development tax credit may be reintroduced in the Legislature.

Medical School: Progress from 2005 in expanding the University of Arizona College of Medicine Phoenix campus in partnership with Arizona State University must continue and accelerate. The medical school is vital to addressing Arizona's severe physician shortage and providing an essential asset to the state's research infrastructure.

Arizona's Bioscience Roadmap

- Arizona's long-term plan to bring its bioscience sector to national competitiveness
- Driven by an extensive collaboration among statewide scientists, business and policy leaders
- Research and facilitation provided by Battelle
- Commissioned and coordinated by the Flinn Foundation
- Translational research component co-sponsored by Arizona Biomedical Research Commission
- Details available at www.flinn.org

Road Test

The latest data is starting to reflect initial *Roadmap* implementation efforts begun in 2003. How is Arizona performing on key measures?

NIH Grants: Up 30 percent between 2001-04. Arizona has matched the annual growth rate of the top-10 states, a *Roadmap* goal set for 2007. The state has achieved 75 percent of its 2007 goal of reaching $214 million.

Jobs and Firms: Up 11.8 and 6.6 percent, respectively, during 2000-04. Hospitals and labs – one of five subsectors comprising the biosciences – continues to drive employment, while research and testing makes encouraging gains, and medical devices anchors the state's industry.

Wages: Up 27.6 percent between 2000-04. Bioscience workers in Arizona earn an annual salary of $43,359 compared to $34,043 for all industries.

Venture Capital: Arizona recorded its best year ever in 2004 in biotech and pharmaceutical VC, generating nearly $20 million. The pace is continuing in 2005.

Entrepreneurialism: Comparing 2002 to 2004, university start-up firms in the biosciences increased from 2 to 11; patents issued grew from 13 to 19; and licenses and options granted increased from 20 to 25.

Major Arizona Achievements

2000

- Arizona voters pass Proposition 301, providing $1 billion over 20 years for science and technology at the state's universities.

2002

- TGen formed; International Genomics Consortium moves to Arizona.
- *Arizona's Bioscience Roadmap* launched.

2003

- Legislation passed to allocate $440 million for construction of university research facilities.

2004

- ASU and UA agree to partner on an expansion of the UA medical school in Phoenix.
- Voters approve $100 million for bioscience and healthcare training and facilities at Maricopa Community Colleges.

2005

- C-Path debuts in Tucson.
- Legislation passed to provide tax credits for angel investors.

A Statewide "Bio-Tapestry"

MANY DIVERSE ORGANIZATIONS ARE FUELING COLLABORATIVE EFFORTS TO CRAFT ARIZONA'S FUTURE IN BIOSCIENCE.

ASSOCIATIONS CORPORATE EDUCATION GOVERNMENT, TRIBES HOSPITALS, RESEARCH INSTITUTES PHILANTHROPY

ARIZONA BIOINDUSTRY ASSOCIATION SALT RIVER PROJECT NORTHERN ARIZONA UNIVERSITY INTEL
INTEGRATED BIOMOLECULE CORPORATION INTERNATIONAL GENOMICS CONSORTIUM MOTOROLA
ARIZONA DEPARTMENT OF COMMERCE HIGH THROUGHPUT GENOMICS ARIZONA STATE UNIVERSITY
DMB ASSOCIATES HERBERGER ENTERPRISES ARIZONA HOSPITAL AND HEALTHCARE ASSOCIATION
PIMA COMMUNITY COLLEGE SCOTTSDALE HEALTHCARE RESEARCH CORPORATION TECHNOLOGIES
BARROW NEUROLOGICAL INSTITUTE AT ST. JOSEPH'S HOSPITAL AND MEDICAL CENTER ARIZONA SUPREME COURT
BLUE CROSS BLUE SHIELD OF ARIZONA GOVERNOR'S COUNCIL ON INNOVATION AND TECHNOLOGY ARRIS VENTURES
NAIOP MOLECULAR PROFILING INSTITUTE MESA PUBLIC SCHOOLS ORTHOLOGIC CORP. ST. LUKE'S HEALTH INITIATIVES
UA BIO5 ARIZONA COMMISSION ON MEDICAL EDUCATION AND RESEARCH ARIZONA TECHNOLOGY ENTERPRISES
TREO GREENBERG TRAURIG, LLP ARIZONA BIOMEDICAL RESEARCH COMMISSION CENTER FOR THE FUTURE OF ARIZONA
TGEN SOUTHERN ARIZONA LEADERSHIP COUNCIL PHOENIX UNION HIGH SCHOOL DISTRICT W.L. GORE & ASSOCIATES
COMMERCE AND ECONOMIC DEVELOPMENT COMMISSION SOUTHERN ARIZONA VA HEALTHCARE SYSTEM ENSYNCH
UNIVERSITY OF ARIZONA CORONADO VENTURE MANAGEMENT CITY OF GLENDALE GREATER PHOENIX LEADERSHIP
CITY OF MESA GREATER PHOENIX ECONOMIC COUNCIL VALLEY VENTURES, LLC GILA RIVER INDIAN COMMUNITY
SONORA QUEST LABS PAYSON BIOTEAM COPPERSMITH, GORDON, SCHERMER, OWENS & NELSON, PLC MAYO CLINIC
L. ROY PAPP & ASSOCIATES CITY OF SCOTTSDALE AND MAYOR'S OFFICE VERITAS HOLDINGS ARIZONA SENATE
CARL T. HAYDEN VA MEDICAL CENTER CORPCOM STRATEGIES ARIZONA PARTNERSHIP FOR HIGHER EDUCATION
CITY OF AVONDALE MARIPOSA COMMUNITY HEALTH CENTER SANOFI-AVENTIS ARIZONA TECHNOLOGY COUNCIL
MARICOPA COMMUNITY COLLEGES GREATER FLAGSTAFF ECONOMIC COUNCIL ARIZONA COMMUNITY FOUNDATION
FLAGSTAFF REGIONAL MEDICAL CENTER BANK ONE FLAGSTAFF CHAMBER OF COMMERCE TUCSON ELECTRIC POWER
THE VIRGINIA G. PIPER CHARITABLE TRUST PINNACLE WEST CAPITAL CORP. ARIZONA HOUSE OF REPRESENTATIVES
ARIZONA PUBLIC SERVICE CITY OF BUCKEYE PHOENIX CHILDREN'S HOSPITAL GARY L. BOWEN AND ASSOCIATES
GREATER PHOENIX CHAMBER OF COMMERCE WASATCH VENTURE CAPITAL ARIZONA BIOMEDICAL COLLABORATIVE
CITY OF FLAGSTAFF AND MAYOR'S OFFICE PRICEWATERHOUSECOOPERS BANNER GOOD SAMARITAN MEDICAL CENTER
ARIZONA BUSINESS ACCELERATOR CITY OF SURPRISE ARIZONA ANGELS ARIZONA DEPARTMENT OF HEALTH SERVICES
OFFICE OF THE GOVERNOR THE BUSINESS JOURNAL SOUTHERN ARIZONA TECHNOLOGY COUNCIL STONER-ROLAND, LLC
UA SCIENCE AND TECHNOLOGY PARK PRESCOTT VALLEY ECONOMIC DEVELOPMENT FOUNDATION ASU TECHNOPOLIS
WESTMARC TMC HEALTHCARE VALLEY VENTURES II, LP SUN HEALTH RESEARCH INSTITUTE SNELL & WILMER, LLP
IMARX THERAPEUTICS CITY OF TEMPE AND MAYOR'S OFFICE GREATER YUMA ECONOMIC DEVELOPMENT CORPORATION
CITY OF PRESCOTT ARIZONA CENTER FOR INNOVATION SOLSTICE CAPITAL OFFICE OF THE ATTORNEY GENERAL
C-PATH BIOINDUSTRY ORGANIZATION OF SOUTHERN ARIZONA THE KEMPER AND ETHEL MARLEY FOUNDATION
SALT RIVER PIMA-MARICOPA INDIAN COMMUNITY WELLS FARGO ARIZONA DOWNTOWN PHOENIX PARTNERSHIP
MARICOPA INTEGRATED HEALTH SYSTEMS COMERICA NORTHERN ARIZONA TECHNOLOGY AND BUSINESS INCUBATOR
CREATIVE HEALTHCARE SOLUTIONS CITY OF CHANDLER CB RICHARD ELLIS NAU SABRE THE PLAZA COMPANIES
CAPITOL BANCORP ARIZONA BOARD OF REGENTS LEE & ASSOCIATES CITY OF PHOENIX AND MAYOR'S OFFICE
BHHS LEGACY FOUNDATION MEDTRONIC ARIZONA MEDICAL ASSOCIATION SUNCOR DEVELOPMENT
BANNER HEALTH SYSTEM BIODESIGN INSTITUTE AT ASU AEA ARIZONA LEWIS & ROCA, LLP
DEVRY NIDDKD CITY OF TUCSON AND MAYOR'S OFFICE CATHOLIC HEALTHCARE WEST
MICROSOFT ARIZONA TOWN HALL COX COMMUNICATIONS ASU RESEARCH PARK
FLAGSTAFF 40 MARTINEZ AND CURTIS, PC FLINN FOUNDATION RIBOMED
SALT RIVER DEVCO YAVAPAI COLLEGE JOBPATH MARICOPA COUNTY

ADDITIONAL INFORMATION ON ARIZONA'S BIOSCIENCE INDUSTRY AND THE FLINN FOUNDATION CAN BE FOUND AT WWW.FLINN.ORG.

Build Research Infrastructure

➔ **C-Path launched:** A one-of-a-kind institute officially opens its doors in Tucson with the promise of reshaping the way prescription drugs and medical devices get from concept to market. The Critical Path Institute (C-Path) – an independent, nonprofit organization founded by UA, the U.S. Food and Drug Administration, and SRI International – aims to improve the drug-development system to produce therapeutics using methods that are faster, safer, and smarter.

➔ **Medical school advances:** A commission headed by Gov. Janet Napolitano plans curriculum, facilities, and other elements of the Phoenix-based UA medical school in partnership with ASU. The Legislature authorizes $7 million for startup expenses after a lengthy political battle, and the City of Phoenix approves a $25 million loan from the federal New Market Tax Credit program. Renovation begins on three historic buildings at the Phoenix Biomedical Campus to house the medical school.

➔ **NAU unveils SABRE:** The Arizona Board of Regents approves a new bioscience institute at Northern Arizona University focusing on translational research, the Strategic Alliance for Bioscience Research and Education (SABRE).

➔ **Major grants landed:** Arizona's funding from the National Institutes of Health and other key sources continues to grow. Among the largest grants are $14.8 million to the Biodesign Institute at ASU to develop a pediatric pneumonia vaccine; $21.6 million for UA's Arizona Cancer Center for colon cancer studies with Mayo Clinic, TGen, and others; $15 million for TGen on pancreatic cancer; and $8.5 million for NAU and TGen to study two deadly diseases.

➔ **Research Commission changes focus:** The Arizona Biomedical Research Commission, a state agency charged with funding Arizona researchers and clinicians, realigns its strategies to support collaborative projects consistent with *Arizona's Bioscience Roadmap.*

➔ **TGen labs open:** A host of TGen research facilities debuts, including its headquarters in downtown Phoenix; a new Mayo Clinic Collaborative Research Building that devotes one floor to TGen operations, including drug-development subsidiary TD2; a new clinical lab with Scottsdale Healthcare; and a pediatric neurogenetics center in partnership with St. Joseph's Hospital and Medical Center.

Build Critical Mass of Firms

➔ **Major companies choose Arizona:** InNexus Biotechnology, a Canadian drug development firm, selects Scottsdale to base its U.S. headquarters and potentially a manufacturing plant that would employ 150. Covance, a leading global drug-developer, purchases acreage in Chandler with the intent of building a testing facility that would employ 400 or more.

➔ **Local firms grow:** In Flagstaff, W.L. Gore & Associates, a medical-device manufacturer and one of Arizona's largest bioscience companies, announces plans to build a new 100,000 square-foot building and add 100 jobs a year for several years. Aventis Pharmaceuticals, an affiliate of Sanofi-Aventis, a France-based firm with operations in Tucson, opens a regional office in Scottsdale.

➔ **UA plans bioscience park:** The University of Arizona is concepting a new bioscience park in South Tucson for start-up and emerging companies. The 350-acre campus is expected to feature lab and office space, as well as commercial and residential developments.

➔ **Tech parks expanding:** The UA Science and Technology Park introduces the Center for Technology Commercialization, a program to house and assist young biotech and technology firms. ASU considers a second research park, expecting its current facility to be at capacity within two years.

➔ **TGen spinout gets funding:** Molecular Profiling Institute, a firm created by TGen and the International Genomics Consortium to commercialize TGen discoveries, receives $7.5 million, one of the largest investments in an Arizona start-up in 2005.

Enhance Business Environment

- **Angel tax-credit bill passes:** The technology community scores a major victory in the Legislature with the passage of a bill to stimulate investment in early-stage technology firms. The legislation enables "angel" investors to secure tax credits of 30 percent for investment in tech firms and 35 percent for biotech and rural companies.
- **Bio venture capital on rise:** Though still in need of improvement, growing venture-capital activity among bioscience-related firms such as AmpliMed Corp., High Throughput Genomics, and Sensys Medical Inc. helps Arizona to a prosperous year in 2005.
- **Arizona gains at bio expos:** The Arizona Bio Expo 2005 attracts about 250 attendees, its largest number to date. The event, organized by the Arizona BioIndustry Association, features an inaugural biotech awards dinner. A delegation of about 50 individuals and 27 exhibiting organizations represents Arizona at the BIO convention in Philadelphia, the world's largest biotechnology trade show.
- **Arizona BIO chapter to staff up:** The Arizona BioIndustry Association adds professional staff for the first time via a grant from the Flinn Foundation. The funding is intended to help the growing trade association to build its infrastructure and assume a greater leadership role in the development of Arizona's bioscience sector.
- **FAST grants leverage federal dollars:** Medipacs, a Tucson biotech firm, receives a $100,000 Small Business Innovative Research Phase I grant. This stemmed from an earlier $5,000 Arizona FAST grant intended to spur SBIR and related funding. The FAST program has led to $3.1 million in SBIR grants for Arizona companies since its inception in 2003.

Prepare Workforce, Educate Citizens

- **Grant bolsters workforce in southern Arizona:** Pima Community College and employers in Pima County benefit from a federal grant of more than $275,000 awarded to JobPath Inc. The award will help build local bioscience industry through a summer biotechnology education institute, plus job-training and internship programs.
- **Arizona Town Hall examines biosciences:** More than 150 civic leaders spend four days at the Grand Canyon discussing Arizona's plans, progress, and opportunities to advance in the biosciences. Town Hall officials plan to share and promote a final plan with audiences throughout Arizona.
- **Phoenix hosts Intel Science Fair:** The world's premier science event for high school students, the Intel International Science and Engineering Fair, is held in downtown Phoenix. The six-day competition involves more than 1,400 student finalists from 40 countries and thousands of additional students, teachers, judges, and others.
- **Bio curricula added:** Pima Community College announces a new program to train medical laboratory technicians, helping to fill a void following the closure of a similar program at UA. New biotechnology courses are introduced and planned by Maricopa Community Colleges. ASU launches its new master's program in biotechnology and genomics, the nation's first.
- **Schools learn from TGen:** Arizona high school administrators attend a symposium sponsored by Salt River Project to learn how schools can connect with TGen and the larger bioscience industry. A similar event will follow in 2006 for teachers.
- **Bio-101 website launched:** A new website, Arizona BioBasics, provides fundamental information about Arizona biosciences in plain language. The site, accessible at www.arizonabiobasics.com, is geared to lay audiences with basic questions about the state's efforts and resources.