



Arkansas

Programs & Initiatives Advancing the Biopharmaceutical Industry



Key Programs & Initiatives

The opportunities generated by the biopharmaceutical sector as a leader in innovation and high quality job creation are not limited to just a few states, but have a substantial national footprint across states. States proactively pursue the development of the biopharmaceutical sector because it represents: a large-scale, geographically dispersed supply chain spanning R&D through to production and distribution; a key driver of the economy including the recent economic recovery; and a sector paying high wage rates in quality jobs. States are deploying a range of programs and initiatives to support and grow the biopharmaceutical industry, including: comprehensive state development strategies; investments in R&D and related infrastructure; programs to boost venture capital, entrepreneurship, and innovation development; advanced manufacturing; economic incentive initiatives; and programs working to advance STEM education and training. Arkansas has identified the biosciences as a targeted industry and has implemented an extensive set of initiatives to promote technology-based research and industry development with several specific to the biosciences.

Quick Guide: Arkansas's Programs & Initiatives Advancing the Biopharmaceutical Industry



Comprehensive State Strategies to Support Biopharmaceutical Development:

- The Arkansas Economic Development Commission (AEDC)



R&D Investment:

- The Arkansas Biosciences Institute
- The Arkansas Research Alliance
- State of Arkansas Collaboration with FDA's National Center for Toxicology Research



Biosciences Infrastructure Development:

- Arkansas Research and Technology Park in Fayetteville



Venture Capital, Entrepreneurship, and Other Innovation Related Programs and Initiatives:

- University of Arkansas for Medical Sciences' BioVentures
- AEDC Technology Transfer Assistance Grant Program
- Innovate Arkansas
- GENESIS Technology Incubator
- Arkansas Regional Innovation Hub
- HubX Life Sciences Accelerator Program
- The Venture Center
- AEDC Seed Capital Investment Program
- AEDC Technology Development Program
- Arkansas Risk Capital Matching Fund



Economic Incentives:

- R&D Tax Credit



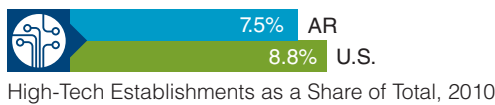
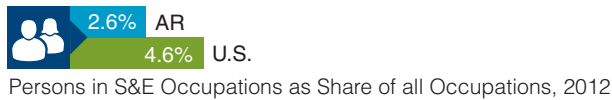
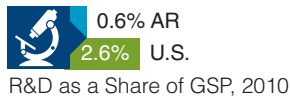
STEM Workforce & Education:

- Arkansas Science, Technology, Engineering and Math (STEM) Coalition
- Arkansas Advanced Initiative for Math and Science

Impacts

- **The Arkansas Biosciences Institute (ABI)** – ABI reports that collectively since its inception, ABI scientists have used the ABI funding to leverage \$509 million in new extramural funding. Since the inception of ABI in the early 2000s, consortium scientists have generated \$3.61 in extramural awards for every ABI dollar they received. In FY 2015 alone, ABI-supported research investigators and ABI resources led to 483 research publications, supported 326 full-time equivalent jobs, recruited 9 new scientists, filed 24 patent applications, and were awarded 9 new U.S. patents.
- **The Arkansas Research Alliance** – in its 2014-15 annual report, ARA notes through its two programs, Scholars and Fellows, it has nearly doubled its researchers in the past year.
- **University of Arkansas for Medical Sciences' BioVentures** – highlights more than 20 companies it has spun off from its research and technologies.
- **Innovate Arkansas** – its programming has led to the launch of more than 100 start-ups in Arkansas, the creation of more than 600 state jobs, \$226 million in revenue from these ventures, and \$265 million raised by clients through private and public investments and via federal grants.
- **The Venture Center** – since 2014, the Center has helped to support the creation of 286 new jobs and its member companies have raised a collective \$19 million.
- **Arkansas STEM Coalition** – in the past 4 years, has distributed over \$511,000 to the 12 Arkansas STEM Centers to purchase science and math equipment which reached 33,155 students in grades 3-6.

Arkansas by the Numbers



Source: National Science Foundation, Science & Engineering Indicators 2014.

Comprehensive State Strategies to Support Biopharmaceutical Development

The Arkansas Economic Development Commission (AEDC)

recognizes a number of targeted industries and industry strengths including the biosciences with noted strengths and major employers in the agricultural biosciences, medical devices, and related research laboratories. Within AEDC, the Science and Technology Division is focused on the commercialization of research, via development of research infrastructure leading to the launch of successful entrepreneurial companies and administers many of the state's research and technology development programs that were formerly under the Arkansas Science & Technology Authority (ASTA).

R&D Investment Programs and Initiatives

The Arkansas Biosciences Institute (ABI) is a research consortium focused in agricultural and medical research to improve the health of Arkansans. The Institute was envisioned during a statewide planning process for the use of Arkansas' share of the 1998 national tobacco settlement. Voters approved the Tobacco Settlement Proceeds Act of 2000 and the Arkansas General Assembly enacted the provisions that included establishing the Institute.

The research consortium spans five member organizations—Arkansas Children's Hospital; Arkansas State University; the University of Arkansas Division of Agriculture; the University of Arkansas - Fayetteville; and the University of Arkansas for Medical Sciences. Consortium scientists focus on basic and clinical biomedical research particularly in areas of tobacco-related diseases, their reduction and prevention. To maintain quality research with relevance, ABI utilizes a Science and Industry Advisory Committee to continually assess its programs. The Committee provides advice and recommendations for potential areas of new research, ideas for strengthening existing research, promoting research to the public and facilitating commercialization.

Specifically, the legislation creating the Institute outlines the purpose of the consortium to conduct:

- Agricultural research with medical implications;
- Bioengineering research that expands genetic knowledge and creates new potential applications in the agricultural-medical fields;
- Tobacco-related research that identifies and applies behavioral, diagnostic, and therapeutic knowledge to address the high level of tobacco-related illnesses in Arkansas
- Nutritional and other research that is aimed at preventing and treating cancer, congenital and hereditary conditions, or other related conditions
- Other areas of developing research that are related or complementary to primary ABI-supported programs.

Outcomes: In its 2015 annual report, ABI reports that collectively since its inception, ABI scientists have used the ABI funding to leverage \$509 million in new extramural funding for Arkansas. Since the inception of ABI in the early 2000s, consortium scientists have generated \$3.61 in extramural awards for every ABI dollar they received. In FY 2015 alone, ABI-supported research investigators and ABI resources led to 483 research

publications, supported 326 full-time equivalent jobs, recruited 9 new scientists, filed 24 patent applications, and were awarded 9 new U.S. patents.

The Arkansas Research Alliance (ARA). Launched in 2008 as a public-private partnership, the ARA is a collaboration of state research universities and private sector leaders working together to create greater economic opportunities in Arkansas by advancing university research and innovation with the goal of incubating new businesses and creating high-paying jobs in Arkansas. ARA is focused on bringing science to the marketplace to bolster the state's entrepreneurial efforts through the recruitment and retention of top research talent in fields and technology areas that are commercially viable in Arkansas. ARA facilitates collaboration among five state research universities and the U.S. Food and Drug Administration's National Center for Toxicological Research (NCTR).

- In 2010, the ARA launched its Arkansas Research Alliance Scholars program to bring new research talent to Arkansas with expertise across numerous scientific fields, including in the biosciences. Examples of current research projects span drug development, stem cell research, and membrane technologies.
- In addition to scientific recruitment into the state, ARA also supports researchers already in Arkansas through its ARA Fellows program. The program supports distinguished scientists with an established track record of impact currently employed at one of the state's five research universities with a 3-year, \$75,000 grant.
- **Outcomes:** In its 2014-15 annual report, ARA notes through its two programs, Scholars and Fellows, it has nearly doubled its researchers in the past year.

State of Arkansas Collaboration with FDA's National Center for Toxicology Research. An ongoing research collaboration between the State of Arkansas and the FDA's National Center for Toxicology Research, a leading national laboratory on regulatory sciences, has been formalized through a memorandum of understanding involving collaborative research, education and industry outreach projects involving advancing regulatory sciences. Among its research collaborations are projects addressing the health and safety of graphene-based nanomaterials and assessment of lung cancer-based precision medicine approaches, including use of blood biopsies to detect circulating tumor DNA. A new statewide bioinformatics consortium has also been funded through this collaboration. The Arkansas Research Alliance administers this collaboration and its many projects with support from both the State of Arkansas and the FDA.

Programs and Initiatives to Build Bioscience Infrastructure

Arkansas Research and Technology Park in Fayetteville (ARTP). The University of Arkansas Technology Development Foundation manages the research park which spans two campuses (West Campus at 72 acres and East Campus at 54 acres), three multi-tenant facilities and three multi-disciplinary research facilities comprising approximately 285,000 square feet, all supporting R&D and manufacturing and industry-university collaboration. The park is home to 34 public/private affiliates and more than 20 University of Arkansas research centers, institutes, and labs. Among these tenants are several engaged in bioscience-related R&D including biotechnology and biopharmaceutical-related therapeutic development, contract research, nutraceuticals, and more.

In addition to its core facilities and R&D infrastructure, ARTP is home to a number of value-adding service offerings and specialized facilities for Park tenants including:

- Integrated access to University resources, expertise, and talent;
- The GENESIS technology business incubator (see Entrepreneurial Development section);
- The University of Arkansas Innovation Center, providing office and lab space for tech-oriented companies particularly those graduating from the incubator to co-locate with university faculty;
- The Enterprise Center, custom designed for labs in addition to office and manufacturing space;
- The High-Density Electronics Center (HiDEC) focused on all aspects of advanced electronic packaging, which includes 6,000 square feet of clean room space;
- The Engineering Research Center with seven interdisciplinary labs including for Computational Biology & Biomedical Engineering Laboratory; Stem Cell, Tissue Engineering & Molecule Imaging; and Bio/Nano technology.

Venture Capital, Entrepreneurship, and Other Innovation Related Programs and Initiatives

Innovation Development

University of Arkansas for Medical Sciences' BioVentures.

UAMS represents the state's largest institution for basic and applied research with more than \$100 million in annual research funding. UAMS BioVentures was formed to translate the research of UAMS into commercial products benefitting human health and scientific and economic development, and in doing so to promote a biomedical technology industry for Arkansas. BioVentures plays a key role in facilitating industrial interactions with University faculty, technology transfer, and the development of new business start-ups based on UAMS technology. BioVentures' serves as the nexus for UAMS innovation, entrepreneurial educational models, and the management of intellectual property as well as acting as an entry point for companies seeking collaborations.

- **Outcomes:** BioVentures highlights more than 20 companies it has spun off from its research and technologies.

AEDC Technology Transfer Assistance Grant Program

(TTAG) assists Arkansas' businesses in developing or improving products or processes through the transfer of technical solutions to technology-based, industry-driven problems, thus enhancing that enterprise's market competitiveness. AEDC will fund up to \$3,750 of costs associated with transferring new or existing technology from a qualified applicant — such as a public or private enterprise, laboratory, college or university — to an enterprise based in Arkansas. Up to \$5,000 of total project costs will be considered, with the first \$2,500 funded by the Authority; the remaining \$2,500 is cost-shared equally (50:50) between the Authority and the enterprise.

Entrepreneurial Development

Innovate Arkansas. Innovate Arkansas is a state-funded initiative to help grow promising technology-based businesses in the state. The organization, funded by the Arkansas Economic Development Commission and administered by Winrock International, assists entrepreneurs with services including acceleration, and sourcing both capital and talent.

- **Outcomes:** Innovate Arkansas reports that its programming has led to the launch of more than 100 start-ups in Arkansas, the creation of more than 600 state jobs, \$226 million in

revenue from these ventures, and \$265 million raised by clients through private and public investments and via federal grants.

Arkansas is home to several technology-oriented business incubators seeking to assist state entrepreneurs in growing new companies.

GENESIS Technology Incubator at the Arkansas Research and Technology Park.

GENESIS offers services to qualifying technology-intensive companies and entrepreneurs who are interested in locating near the university for early-stage development. The incubator acts as an entry point to the ARTP for start-ups working on emerging technologies.

Arkansas Regional Innovation Hub. Located in North Little Rock, the Innovation Hub is a 15,000 square foot space designed for entrepreneurs and including co-working space and a technology lab. The Innovation Hub also provides prototyping services, "makerspace" to build products and equipment, as well as arts and design studios.

HubX Life Sciences Accelerator Program. Represents a privately-funded partnership among the Arkansas Regional Innovation Hub along with Baptist Health and Arkansas Blue Cross Blue Shield in a unique effort to drive health care innovation and new start-ups. HubX is looking for promising start-ups that are addressing digital health care platforms, health care services, and medical devices. For entrepreneurs the value proposition includes the opportunity to partner with large health payers and providers with direct access to these institutions and their sites as potential test beds, access to mentors and facilities, and audiences with angel and other investors. Start-ups have the potential to receive \$25,000 or \$50,000 of seed investment depending on the technology area.

The Venture Center. Launched in Little Rock in 2014, the Venture Center helps startups become viable businesses through systematic programming, mentorship, and strategic acceleration. The Center lists approximately 50 ventures associated with it and several are bioscience-related start-ups.

- **Outcomes:** since 2014, the Venture Center has helped to support the creation of 286 new jobs and its member companies have raised a collective \$19 million.

Venture Financing

AEDC Seed Capital Investment Program (SCIP) is designed to provide working capital to support the initial capitalization or expansion of technology-based companies in Arkansas. The program can provide capital up to \$500,000 based on the company's needs. Investments can be repaid through a royalty-based agreement.

AEDC Technology Development Program. The program provides royalty financing for projects possessing a well-developed, comprehensive project plan, and utilizing the benefits of science and technology to provide economic and employment growth potential in Arkansas. The maximum investment is \$100,000 with terms negotiated on an individual basis. These terms are a maximum 5 percent of net sales for a maximum term of 10 years.

Arkansas Risk Capital Matching Fund (ARCMF). The Fund, a program of the Arkansas Development Finance Authority, works to strengthen the financial infrastructure supporting tech-based businesses in Arkansas. ARCMF targets early-stage, technology-based businesses unable to attract adequate private resources for growth and development. A portion of the fund is used to validate early-stage technologies prior to further investment. To qualify, a company must be part of a set of targeted industries which explicitly includes biotechnology, bioengineering, medical technology, and the life sciences.

- ARCMF currently makes available matching funds of up to \$100,000 from the Technology Validation Account; and currently makes available matching funds of up to \$750,000 from the Enterprise Development Account to augment investments proposed or made by angel or other institutional investors.

Economic Incentives

R&D Tax Credit. Tax credits for qualified R&D are split into two categories based on whether a company qualifies as a “targeted business”:

- **In-House Research and Development:** New and existing eligible businesses that conduct “in-house” research that qualifies for federal R&D tax credits may qualify for in-house research income tax credits. The credit allowed is 20% of qualified research expenditures that exceed the base year, for a period of three years and the incremental increase in qualified research and expenditures for the succeeding two years. For a new in-house research facility, the base year is zero. Therefore, in the first three years following the date of the financial incentive agreement, all eligible expenditures can qualify for the credit.
- **In-House Research by a Targeted Business:** Targeted businesses, at the discretion of the AEDC Executive Director, may be offered income tax credits equal to 33% of the qualified research and development expenditures incurred each year for up to five years. The application for this income

tax credit shall include a project plan, which clearly identifies the intent of the project, the expenditures planned, the start and end dates of the project and an estimate of total project costs. Income tax credit for research and development earned by targeted businesses may be sold.

In addition, an eligible business that contracts with one or more Arkansas colleges or universities in performing research may qualify for a 33% income tax credit for qualified research expenditures.

Tax credits under these programs may be carried forward for nine years and may offset up to 100% of a business’ tax liability in a given year.

STEM Workforce & Education Programs and Initiatives

Arkansas Science, Technology, Engineering and Math (STEM) Coalition. The STEM Coalition is a partnership of state leaders representing the business, education, government, and local community sectors which plans, encourages, coordinates and advocates policies, strategies, and programs supportive of excellence in science, technology, engineering, and mathematics (STEM) teaching and learning to help grow the Arkansas economy and high-paying jobs. Among its many objectives are to: provide teacher professional development opportunities, strengthen the preparation of pre-service teachers, improve student STEM achievement, assist in curriculum development and assessment, and promote key collaborations and partnerships. The STEM Coalition receives funds from education license plates from the Arkansas Committed to Education Foundation. It has established a network of 12 Centers for STEM Education across the state.

- The Coalition is involved in several specific program initiatives—Million Women Mentors, STEM Girls Leadership Conferences, the Computer Science Initiative, Laptop Loan Program, and programs in robotics.
- In the spring of 2016, the STEM Coalition distributed federal Carl Perkins funds from the Arkansas Department of Career Education to the Arkansas STEM Centers. This allowed them to implement 12 STEM Girls Leadership Conferences statewide. More than 720 girls in grades 10-12 participated in learning about robotics, engineering, nanoscience, biotechnology, and science careers.

- **Outcomes:** In the past 4 years, the STEM Coalition has distributed over \$511,000 to the 12 Arkansas STEM Centers to purchase science and math equipment which reached 33,155 students in grades 3-6.

Arkansas Advanced Initiative for Math and Science (AIMS).

An initiative launched in 2007 to increase the number of students participating in math and science Advanced Placement classes, providing professional development for teachers and online tools and a summer AP boot camp for students, among other resources. It now reaches 60 high schools in Arkansas and served over 3,500 students in 2015-2016 school year. It has had a significant impact on Arkansas student access and success in AP courses over the past 8 years, including having Arkansas lead the nation in the percent increases in African-American and Hispanic students receiving a qualifying score on AP exams and ranking third in the nation in the percent increase of students taking AP classes and receiving a qualifying score overall. A 2016 evaluation found that a sizable increase in college attendance and salaries earned six years after high-school graduation for those students enrolled in AP courses.