

## Birmingham Biotechnology Hub

**Region:** Birmingham–Hoover MSA (Bibb, Blount, Chilton, Jefferson, St. Clair, Shelby, and Walker counties), with regional and national connectivity through the Consortium

**Key Technology Focus Areas:** (7) Biotechnology, medical technology, genomics, and synthetic biology; enabled by (1) Artificial intelligence, machine learning, autonomy, and related advances Biotechnology, medical technology, genomics, and synthetic biology

**Geographic Constraints:** Atlanta Regional Office, EPSCoR state, significant engagement and benefit to underrepresented communities

### 1. Executive Summary

The acceleration of the U.S. biotechnology industry, including the use of artificial intelligence (AI) for drug discovery and development and precision medicine, depends upon our ability to access, connect, and act upon large volumes of patient data. China is winning the patient data race by leveraging its authoritarian systems to collect huge volumes of patient data while also leveraging that data to support investments in biotechnology innovation. However, the U.S. has a more diverse population than China, offering a significant advantage in American efforts to increase national security through global leadership in the biotechnology industry, provided the U.S. can unlock the full potential of our demography to accelerate innovation.

Existing gaps in patient data limit our understanding of the human genome, exacerbate mistrust in medicine among underrepresented populations, undermine the efficacy of treatments for overlooked communities, and further widen health disparities even as AI-driven precision medicine promises to better tailor diagnostics, therapeutics, and preventative care to patients' individual needs.

The partners assembled in the Birmingham Biotechnology Hub will close industry gaps through projects that leverage the region's distinctive and proximate strengths in diverse patient recruitment, nationally recognized R&D, and commercialization. By creating an ethically driven model for the collection and utilization of diverse genomic data, leveraging that data to spur precision medicine innovation, and removing barriers to commercialization for biotech companies, the Hub will position Birmingham to double its biotech workforce over the next decade and lead the world in accessible precision medicine.

### 2. Synopsis of Consortium Vision, Initiatives, Partners & Outcomes

Nearly 80% of genome-wide association studies globally are conducted on individuals of European descent, who comprise only 16% of the global population ([Nature Genetics, no. 51, 2019](#)). Similarly, non-White racial and ethnic groups are significantly underrepresented in U.S. clinical trials. For example, <20% of the drugs approved by the Food and Drug Administration (FDA) between 2014 and 2021 had clinical trial data addressing treatment benefits or side effects for Black patients ([Goldman et al, USC](#)). Birmingham Biotechnology Hub (Hub) consortium members and partners recognize that the U.S. cannot truly unlock global competitiveness in AI-driven biotechnology and, by extension, a healthier and more economically productive America, without increasing representation in clinical genomic data and clinical trials. Thus, the Birmingham region's competitive advantage is **Catalyst**, a first-of-its-kind genomic biobank that enables accessible precision medicine. Catalyst creates access to precision medicine for a historically marginalized, diverse, and disease-burdened patient population (now mandated by the FDA's April 2022 guidance). It secures unique data to undergird the American supply chain to advance individualized drug discovery and genetic therapies while paving the way for substantial clinical trial investment, an industry that is expected to reach \$95B by 2030 with a CAGR of 7% ([BioSpace, 2023](#)).

Building and maintaining patient trust is critical to the success of Catalyst and, by extension, the Hub, given historical legacies of harm in health access and clinical trials, especially among Black communities in the region. Moreover, the advent of precision medicine has increasingly blurred the lines between R&D and healthcare delivery. Consequently, a more diverse workforce of researchers, clinicians, coordinators, entrepreneurs, and technicians is essential to delivering culturally competent care and advancing the promise of accessible precision medicine for diverse patients. The Hub is investing in a ladder approach to workforce development aimed at removing barriers to biotech for Black and women workers and other underrepresented groups. The **Sub-Baccalaureate Workforce Development** project led by Lawson State Community College, a Historically Black Community College in the region, will increase access to entry-level roles in biotechnology for Black and other underrepresented workers. The **Baccalaureate and Post-Baccalaureate Workforce Development** project led by PROPEL Education, in partnership with Alabama HBCUs, will increase awareness of biotechnology careers for HBCU students and create accelerated, employer-driven credentials to support job placement in biotechnology for HBCU graduates. Additionally, the **Birmingham Bio Innovation Center** proposed by Birmingham Bio Innovation Corporation (BBIC) provides a dynamic center of gravity for biotechnology companies and entrepreneurs to locate and grow in the Birmingham region, with a dedicated technical assistance program for Socially and Economically Disadvantaged Individuals (SEDI)-owned businesses.

With the increased availability of rare, secure, ethically permissioned, clinico-genomic data, AI can more rapidly identify new drug targets, evaluate and optimize the properties of drug candidates to improve safety and toxicity, predict drug candidate efficacy in patients, stratify patient populations by potential risk and benefit, and refine clinical trial design to more effectively target patients with the greatest need. Even modest improvements in early-stage drug development enabled by AI and machine learning (ML) could lead to an additional 50 novel therapies over the next 10 years—a \$50B opportunity ([Morgan Stanley, 2022](#)). However, regulatory use is barely catching up to these advancements, creating a competitive opening for the region able to maximize the potential of developments like the passage of the 2022 FDA Modernization Act, which advances the use of technologies such as *in silico* analysis and AI modeling. The Hub will launch a **Center for Innovation of Platforms for Therapeutics Advancement** (CIPTA), led by the University of Alabama at Birmingham (UAB) and Southern Research (SR), that will leverage a unique public-private partnership structure to **optimize, validate, and scale** *in vitro* and AI platforms for drug discovery and development, prioritizing their qualification for use in regulatory filings to enable broader commercial adoption.

A well-funded and effectively managed backbone entity is necessary to quarterback place-based economic development initiatives and further the region's global competitiveness. Joining the Hub is a newly formed Alabama nonprofit entity, the **Birmingham Bio Innovation Corporation** (BBIC). BBIC builds on proven strategies for place-based, innovation-driven economic development demonstrated by innovation districts around the country. Together with the City of Birmingham, UAB, SR, and additional Hub partners, BBIC is advocating for enabling legislation at the state level that would create sustainable funding for Birmingham's biotechnology ecosystem through a new Southside Innovation District (*see Section 7*). By Q3 2026, the Innovation District will physically house three component projects, including BBIC's offices, the Birmingham Bio Innovation Center, and the two workforce projects at the Biotech Workforce Training Center. The proximity of assets is an asset in itself, ensuring BBIC and the Innovation District catalyze a regional southern nexus for biotechnology innovation.

By attracting and growing biotechnology companies and increasing commercial clinical trial expenditures in the region, Hub partners project **doubling Birmingham's current biotech workforce by 2034 to ~9,000 direct jobs**, spurring ~27,000 indirect jobs. Hub partners have also

set an ambitious goal of reaching \$200M in clinical trial expenditures in the region by 2030. Together, these strategies will position Birmingham as a national and global leader in accessible precision medicine. Furthermore, the Hub will increase national security by providing a feasible and distinctive framework for securing the domestic supply chain of genomic and clinical data and onshoring U.S. drug discovery and development capabilities (*See Section 8 for additional outcomes*)

*Component Projects Summary & Related Commitments*

Project	Related Commitments <i>(See Section 5 for further detail)</i>
<p><b>Catalyst Expansion</b> <i>Lead: Southern Research</i> Catalyst will securely connect patient genomes and other forms of clinical data to expand access to personalized medicine in underserved and unreached areas. Catalyst will expand its headquarters operations in Birmingham to enable the sequencing of 50,000 genomes across the Southern Black Belt.</p>	<p>The City of Birmingham pledges \$5M in ARPA State and Local Fiscal Recovery Funds to the expansion of Catalyst (<i>pending City Council approval in March '24</i>).</p>
<p><b>Birmingham Bio Innovation Center</b> <i>Lead: BBIC</i> BBIC will create a new life sciences incubation center, conduct venture capital partnerships and events, and establish an assistance program for SEDI-owned businesses.</p>	<p>Biolabs and Cambridge Innovation Center will apply for contract opportunities. Corporate Realty will create physical space for the Center in the Innovation District by Q3 '26. Innovate Alabama will invest \$200K.</p>
<p><b>Center for Innovation of Platforms for Therapeutics Advancement (CIPTA)</b> <i>Lead: UAB and Southern Research</i> CIPTA will connect industry, scientific experts, and regulators to advance Therapeutics Acceleration Platforms (“TAPs”) that will accelerate the development of new precision medicines, drug repurposing, and technologies for predictive safety testing.</p>	<p>Innovate Alabama will advocate to remove restrictions currently in place through the Alabama Ethics Law, which prevent faculty at public universities from participating in entrepreneurial activities</p>
<p><b>Sub-Baccalaureate Workforce Development</b> <i>Lead: Lawson State Community College</i> With BIO Alabama, the Alabama Community College System, peer institutions, and employers, Lawson will develop bioscience curricula that respond to employer demand and create platforms for placement of sub-baccalaureate students in good biotech jobs.</p>	<p>The pending state budget currently includes \$7.5M to support the development of a biotech workforce development center in the Southside Innovation District.</p>
<p><b>Baccalaureate and Post-Baccalaureate Workforce Development</b> <i>Lead: PROPEL Education</i> With regional HBCUs, UAB, and industry experts, PROPEL will develop online courses and industry-recognized microcredentials to increase job seeker understanding of the biotech industry and support retention of placed workers in biotech jobs.</p>	<p>The Alabama Community College System Innovation Center will launch a Skills for Success fast-track course to train biotechnicians through a \$5.16M in-kind investment.</p>
<p><b>Birmingham Biotechnology Hub Governance and Operations</b> <i>Lead: BBIC</i> BBIC is the governing office for Birmingham’s new biotech-focused Southside Innovation District. Given its mission alignment with Tech Hubs, the entity will provide grants</p>	<p>Pending innovation district enabling legislation would create a new type of district with bonding capacity through a new public entity for district development.</p>

management, data and evaluation, and cybersecurity services and consortium management support across component projects.	
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*Consortium Members* | *Black-Led* | \*HBCU | \$ Investment Commitment | ^ Policy Commitment

1. Alabama Community College System \$ Jefferson State Community College <i>Lawson State Community College</i> *\$ <i>Miles College</i> * <i>Tuskegee University</i> * University of Alabama at Birmingham	4. BIO Alabama Economic Development Partnership of Alabama <i>Innovate Alabama</i> ^\$ 5. Alabama Industrial Development Training <i>Birmingham Promise</i> Central Six AlabamaWorks
2. <i>City of Birmingham</i> ^\$	6. Birmingham Bio Innovation Corporation <i>Housing Authority of the Birmingham District</i> <i>Regional Planning Commission of Greater Birmingham</i>
3. Avanti Polar Lipids (Croda) Critical Path Institute Evonik \$ In8Bio SecureIT360 Southern Research \$	7. <i>PROPEL Education</i> <i>Tech Birmingham</i> 8. Innovation Depot Julius Education

*Additional Partners* | *Black-Led* | \*HBCU | \$ Investment Commitment | ^ Policy Commitment

5AM Ventures <i>Alabama A&amp;M University</i> * <i>Alabama State University</i> * Alveolus Anthony Philipakkis, GV Bering Capital The Broad Institute	Cortado Ventures Cystic Fibrosis Foundation \$ Dana Farber Cancer Institute/Binney Street Capital <i>Hoover Institute, Stanford University</i> Neel Varshney, Patient Square Capital Orange Grove Bio	Pfizer Ignite State of Alabama ^\$ <i>Stillman University</i> * <i>Talladega College</i> * University of Alabama System
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*Global Competitiveness*

There is ferocious competition to become the global leader in precision medicine, but Birmingham has a rare concentration of assets to become the best in the world at a particular subset: precision population health (PPH). PPH combines social determinants of health (individual lifestyle and environmental factors) with a deeper understanding of patients’ genomes to tailor specific disease treatment and prevention. The region is powered to lead the world in PPH through a unique constellation of proximate assets, including: the nation’s third-largest public health system, UAB Medicine, caring for 3.5M diverse and disproportionately disease-burdened patients annually and driving top-10 volume in clinical trials (tripling over the last six years); growing basic science and sponsored research capabilities at UAB, which attracts \$775M in annual investment and is poised to reach \$1B by 2029; a proven translational research partner in SR, an end-to-end partner in pre-clinical drug and diagnostic development; discrete assets to solve pain points for biotech companies including early-stage, non-dilutive capital, and lower-cost wet lab and office space; and a startup ecosystem poised to capitalize on the commercial potential of basic research.

The proposed projects and commitments will leverage strategic investments and address key constraints limiting competitiveness in precision population health over the next decade by:

- Establishing essential infrastructure, such as commercial wet lab spaces and a diverse biobank, to support clinical trials and attract biotech investments;
- Addressing regulatory barriers to faculty entrepreneurship and facilitating FDA approval pathways for innovative drug discovery methods;
- Activating a skilled workforce through tailored training programs, with a focus on diversity and cultural competence to advance precision medicine;
- Implementing a governance framework and launching a new backbone organization to measure impact, manage risks, and foster economic development in collaboration with public, private, and civic institutions; and
- Facilitating access to capital for SEDI-owned and early-stage companies through technical assistance and raising investor awareness of the region's biotech R&D potential.

The Birmingham Bio Innovation Center and the new backbone organization BBIC are threshold investments that help densify and fortify the region's biotech economy. Catalyst differentiates the region globally by uniquely connecting to patients experiencing persistent health disparities, namely Black Americans whose genomes significantly overlap with the growing population of Africa and the African Diaspora ([NYTimes](#), 2023). CIPTA connects experts in applied biomedical science, clinical data science, and translational regulatory science to U.S. and global industry via a novel public-private partnership structure. The workforce component projects bolster the other strategies because the Hub needs a more diverse workforce of researchers, clinicians, entrepreneurs, and technicians to deliver culturally competent biotech R&D and clinical care. Collectively, these investments enhance a biotech ecosystem that will create jobs by (a) paving a unique path to clinical trial investment and (b) attracting, supporting, and growing early-stage companies who seek to use cutting-edge tools and technologies to address health disparities.

#### *Equity & Environmental Considerations*

Hub partners are committed to addressing pervasive health inequities in biomedical research, particularly the underrepresentation and historical mistreatment of Black Americans, and acknowledge the significant challenge of overcoming patient mistrust to increase participation in genomic sequencing and clinical trials. Catalyst will engage health providers and community health ambassadors hired from regional HBCUs to build patient trust, deploy transparent consent protocols, integrate clinical and genomic data, and provide polygenic risk analysis directly to patients and their providers to ensure patient data benefits individuals first before advancing research.

Notably, many of the patient populations the Hub aims to engage through Catalyst, especially Black and rural patients, live in communities that are vulnerable to air pollution and other social determinants of health (SDOH) and designated as disadvantaged under the Biden-Harris Administration's Justice 40 initiative. For example, ~75% of Birmingham Census tracts are federally designated as historically marginalized and overburdened by pollution and underinvestment in housing, transportation, water and wastewater infrastructure, and health care ([Climate and Economic Justice Screening Tool](#)). Catalyst will arm patients and their providers with diagnostic tools to better address health risks from environmental pollution and other SDOHs.

As the Hub grows quality jobs in biotech, workforce development projects led by Lawson State Community College and PROPEL will create ladder training opportunities starting at the sub-baccalaureate level to ensure that job seekers and incumbent workers—especially Black residents and women—are able to access economic mobility through Birmingham's growing biotech industry. BBIC's Economic Mobility Committee will ensure workforce programs are fully accessible, with particular attention to wrap-around services like childcare and transportation, growing the practice of skills-based hiring among regional biotech employers, and prioritizing residents of public housing and other disadvantaged groups for training and hiring. Combining biotech job growth in the

Southside Innovation District with nearby housing, commercial, and retail will reduce vehicle miles traveled—one of the biggest drivers of greenhouse gas emissions regionally—and increase access to quality jobs at all income levels, especially for car-less residents.

### **3. Barriers to Technology Advancement & Commercialization**

The lack of diversity in patient data, inefficient drug discovery and development processes, and persistent capital barriers between basic research and commercialization are significant challenges obstructing the advancement and accessibility of precision medicines nationally. Despite the promise of precision medicine to tailor treatments based on genetic, social, and environmental factors, the critical lack of diversity in whole genome sequencing (WGS) and clinical trials limits the quality of patient data upon which precision medicine fundamentally relies, further perpetuating health disparities and undermining the efficacy of treatments for underrepresented populations. Moreover, the drug discovery and development process—spanning over a decade with an average cost of more than \$2B per drug—an amount that increased 44% from 2012 to 2022 ([McKinsey and Company, 2022](#))—remains inefficient; this status quo also ensures that life-saving technologies, and the aspiring innovators who endeavor to commercialize them, may never get the opportunity to reach commercialization. At the same time, the “valley of death” capital gap between basic research (TRL 1-3) and translational research (TRL 3-6), stifles innovation and prolongs the time to complete clinical trials, obtain FDA approval, and manufacture biotech products (TRL 6-9).

These challenges are multi-faceted and systemic, and Hub consortium partners recognize that addressing these barriers requires collaboration and new ways of working. For example, researchers at UAB are exploring how polygenic risk stratification can reduce the number of people required to participate in a clinical trial to achieve statistical significance by a factor of ten, saving up to \$270M in clinical trial recruitment costs for some drugs ([UAB News, 2020](#)). Similarly, AI models can optimize patient recruitment for clinical trials based on their genetic markers. UAB’s Hugh Kaul Precision Medicine Institute and SR are actively working on platforms for pharmacogenomic testing, polygenic risk scoring, and clinical trial matching, among other applications of WGS, to accelerate precision medicine advancement. SR is also working to provide innovative lab-to-market solutions through its Station 41 commercialization hub and Therapeutics Development Fund. By pooling resources, expertise, and networks, the consortium aims to address these barriers, accelerate innovation, and deliver more accessible precision medicines within the ten-year timeframe.

### **4. Nexus of Technology Areas, Hub Geography & Assets, National & Economic Security**

Biotechnology has been identified by U.S. national security leadership as one of three key “force multiplier” technologies critical to future economic growth and national security ([Jake Sullivan, 2022](#)). As such, the global competition for dominance in biotechnology between the U.S. and its democratic allies and an autocratic China is heating up. At issue is whether new technologies will be designed and governed ethically with democratic values of privacy and equity or used as tools for suppression, surveillance, and control.

China has designated biotechnology as a priority industry in its 13th Five-Year Plan and the Made in China 2025 initiative ([U.S.-China Economic Security Review Commission, 2019](#)). In a recent speech, Xi Jinping declared that China would be the world’s leader in biotechnology by 2030. [China’s BGI group](#) (formerly Beijing Genomics Institute) is on a path to building the largest genomic data bank in the world, fueled by Chinese Communist Party-backed funding. In November 2023, BGI announced their “Health Silk Road” campaign to conduct additional genomic sequencing in affiliated “Belt and Road” Initiative countries as a diplomatic tool to obtain soft power as well as access to diverse data. Under CCP auspices, China is building a biobank of its population’s genomic data—through a state-sponsored program of surveillance in some areas—that will position China to dominate the development of precision medicines in the coming decade.

The Hub deliberately counters this measure in both aim and implementation. First, the ancestral genomic diaspora of several Belt and Road countries, especially the 44 in Sub-Saharan Africa, shares substantial commonalities with the patient population of the Birmingham region and the Deep South. The Hub will increase U.S. competitiveness in precision medicine by growing the volume and diversity of clinico-genomic data utilized to discover, develop, and target precision medicines. Responsibly growing and protecting U.S.-based biobanks is critical to competing against China’s investments in biobanking and precision medicine development. Likewise, the Hub will enable America to position itself as the appropriate and authoritative source to develop precision medicine that will serve many developing countries. Second, following guidance issued recently by the House Select Committee on China, Catalyst sequencing will be conducted on domestically produced sequencers (NovaSeq X), preventing any data from being shared with BGI or other foreign producers.

### 5. Public-Private Partnerships to Advance the Region’s Biotechnology Competitiveness

Both public and private sector partners are actively engaged in advancing Birmingham's competitiveness in biotechnology, building on the region’s existing strengths as summarized below.

<b>Employers</b>	UAB, Southern Research, Avanti Polar Lipids (Croda), and Evonik are heavily engaged in <b>developing curricula for the workforce programs</b> with BIO Alabama, AIDT, Lawson State Community College, and the Alabama Community College System.
<b>Foundations</b>	The Cystic Fibrosis Foundation is pledging \$25.6M to a <b>center of excellence in pre-clinical data</b> that expands capabilities to create genetic therapies for cures to cystic fibrosis and other respiratory and pulmonary diseases. This will create 13 R&D jobs and drive at least 50 pre-clinical programs to the Hub.
<b>Venture &amp; Private Equity Partners</b>	Major venture funds and private equity partners (see Letters of Commitment) are pledging to <b>enable access to capital for early-stage companies</b> and <b>drive investment</b> in the Hub through: <ul style="list-style-type: none"> <li>- Annual trips to review novel science developed by SR and UAB;</li> <li>- Assessing potential follow-on investments from the Therapeutics Development Fund and other Station 41 commercialization programs;</li> <li>- Raising money from local investors and limited partners (LPs) in Birmingham to densify the biotech investor pool in the Hub;</li> <li>- Referring portfolio companies to subsidized incubator and wet lab space at Station 41 and the Birmingham Bio Innovation Center;</li> <li>- Encouraging companies to pursue clinical trial sites in the Hub;</li> <li>- Facilitating introductions between portfolio companies and contract research capabilities in Birmingham that could enable them to develop preclinical data packages;</li> <li>- Developing an “executive-in-residence” program to grow managerial and leadership talent in the Hub for long-term growth of the biotech industry.</li> </ul>
<b>State Government &amp; Agencies</b>	The State of Alabama Governor’s Office has included \$7.5M in the Education Trust Fund Budget ( <a href="#">HB145</a> , line 160, p. 7) for consideration in the current legislative session to support workforce development activities within the Southside Innovation District, including a Biotech Workforce Training Center.
	The Alabama Community College System Innovation Center will provide \$120K of in-kind curriculum development and \$5.04M of in-kind tuition support to train 1,680 workers in employer-demanded bioscience skills necessary for a range of technician roles through the <b>Skills for Success program</b> .

<b>Local Government</b>	The City of Birmingham plans to invest \$5M in ARPA State and Local Fiscal Recovery Funds under the 1.14 Other Public Health Services category to support the expansion of Catalyst by Southern Research. <i>(Pending legislative vote by City Council).</i>
<b>Legislative Priorities Pending in Current Session</b> <i>(Feb. 6-May 20, 2024)</i>	<p>The current Alabama State Ethics law treats faculty employed at public universities similar to elected or appointed officials, functionally prohibiting faculty from participating in startups. BBIC, Southern Research, UAB, and additional consortium partners are advocating for an exemption for faculty in <a href="#">HB227</a>.</p> <p>BBIC, Southern Research, the City of Birmingham, and additional consortium partners are advocating for legislation to enable cities and counties to create innovation districts. The bill proposes cities and counties work with the state to pledge future revenue in the designated geography toward innovation district development. If passed, the proposed Southside Innovation District will yield an estimated Net Present Value of over \$100M over 10 years to sustain Hub projects and further economic and community development.</p>

**6. Distribution of Benefits & Consideration of Externalities**

*Worker & Economic Benefits*

The growth of both biotech companies and commercial clinical trial expenditures will yield a range of quality jobs at every rung of the career ladder, from entry-level biotechnicians to clinical trialist physicians. Biotechnology represents a relatively well-paying sector, where wages are \$23K (43%) higher than the average working wage (\$54K) within the region. The region’s biotech workforce comprises ~4,600 employees working in relevant biotech industries. Training and employing 1,000 new biotechnology workers in high-quality jobs will result in a projected total worker wage increase of \$23M above average wages in the region. The Hub projects doubling Birmingham’s current biotech workforce by 2034 to ~9,000 direct jobs in biotech and clinical trials. As part of the Governance Project, BBIC, in partnership with Julius Education, will conduct detailed labor market projections and career mapping using AI modeling to better predict in-demand roles in the region’s biotech industry over the next decade. Biotech career mapping tools will be accessible to workers as they chart their careers in this growing industry.

In addition to creating quality, well-paying jobs, Hub governance includes formalized structures for centering worker and resident voices in the advancement of programming. The Economic Mobility Committee will be composed of eight members, including two compensated local residents from the Housing Authority Birmingham District (HABD). Though labor union engagement is challenging in Alabama (a right-to-work state), Hub partners will explore opportunities for worker benefits such as skills-based hiring, employer-sponsored childcare, and commitments to livable wages through BBIC’s Life Sciences Industry Committee. Moreover, the City of Birmingham has implemented a knowledge-based job incentive that redirects traditional economic development incentive dollars to spur employers to hire locally and invest in entry-level talent. Inspired by that model of investing locally and fueled by pledged revenue, BBIC and the Tech Hub Board will actively measure success by training and placing local talent in Hub companies.

*Housing*

In the Birmingham-Hoover MSA, 50% of renter households and 18% of owner households are cost burdened (i.e. paying >30% of income on housing). Nearly 25% of Birmingham residents live below the federal poverty line, and many residents struggle to pay rent and maintain aging homes in a city where the average rent is \$1,297 (RentCafe) and 84% of housing stock is 30+ years old (City of Birmingham Housing Plan). Given the housing constraints of the region and the significant limitations of the local bus system to connect housing to quality jobs, Hub partners are

intentionally co-locating affordable, senior, workforce, and market-rate housing units directly adjacent to workforce training and biotech jobs in the Southside Innovation District (See HABD and BBIC Letters of Commitment). Furthermore, at the policy level, the City of Birmingham is actively pursuing policies that would make it easier to develop housing, including eliminating or significantly reducing parking minimums and enabling more housing typologies by right in the zoning ordinance and pursuing enabling legislation to create a housing trust fund.

#### *Benefits to Historically Underrepresented Populations*

The Birmingham MSA is home to over one-fifth of the state's population (1.11M out of 5M). The state is 26.3% (1.23M) Black or African American, while the MSA is 30% (333k), compared to 12.2% of the U.S. population. The principal City of Birmingham is ~70% Black or African American (Census, ACS). Six out of 7 counties in the MSA contain Census tracts that are classified as rural ([HRSA data](#)), and 6 out of 7 counties are ranked medium-high or high on the [CDC Social Vulnerability Index](#), which measures socioeconomic status, household characteristics, racial and ethnic minority status, housing, and transportation. Racial disparities persist in the region's labor market, where "white men without a four-year degree are nearly as likely to hold a good job as Black women with a four-year degree." ([Brookings, 2021](#)) Similar racial disparities persist in health outcomes. In Jefferson County, where Birmingham is located, life expectancy for Black residents is 3.5 years lower than their White neighbors, with higher rates of heart disease, cancer, stroke and diabetes among Black residents ([Community Health Equity Report, 2018](#)).

Hub partners are committed to addressing these generational disparities through the implementation of component projects. The Sub-Baccalaureate, Baccalaureate, and Catalyst projects will center the training and placement of HBCC and HBCU students in quality biotech jobs, including Catalyst Ambassadors and biotechnicians. Catalyst will improve patient outcomes by enabling early detection of genetic predispositions, accelerating the development of therapeutics tailored to non-White populations, and increasing clinical trial access, which further increases access to primary care among rural and uninsured residents. The Birmingham Bio Innovation Center will prioritize and support SEDI businesses through a dedicated Technical Assistance Program aligned to Innovate Alabama's State Small Business Credit Initiative and InvestAL direct investment requirements and guarantee 10,000 sq. ft. of wet lab space for SEDI and HBCU-led companies.

## **7. Hub Updates, Goals & Sustainability**

### *Updates Since Phase 1*

Since Phase 1, the Hub has continued to refine the mix of consortium members along with Hub strategies. PROPEL joined the consortium to lead the HBCU component project, and Tech Hubs has been a vehicle for deeper engagement with venture and private equity partners (*see Sections 2 and 5*). The timing of major transactions prevented certain partners from submitting letters of commitment in Phase 2, but these venture and startup partners remain verbally committed to the strategy. Notably, in 2023, public, private, and philanthropic leaders in Birmingham came together to co-create and support a shared vision for the region to become the premier biotechnology hub of the Southeast. BBIC was formed as an Alabama nonprofit corporation to advance this shared vision. The new entity complements and continues the foundational work spearheaded by SR as the Hub's Lead Applicant while creating a new governance framework that is equitable, inclusive, and specifically meets the needs of the Hub's large and diverse consortium.

### *Hub Sustainability*

Component projects will be sustained by a variety of funding streams. First, the pending innovation district legislation will provide ample funds to sustain the Innovation Center, workforce programs, and backbone entity. Additionally, Catalyst will create earned income streams from

partnering pharmaceutical and biotechnology companies. Finally, workforce programs will be sustained by tuition sponsorship of current and future employers seeking qualified talent for in-demand roles. State workforce funding will continue to support curriculum development, program delivery, and tuition through existing programs of ACCS and Alabama Industrial Development Training (AIDT). Sustainability goals are built into component project milestones and will be tracked by the Hub.

## 8. Outcomes Across Component Projects

Hub partners are aligned on the following overarching goals and metrics for measuring the Hub’s progress over the five-year term of the grant. Project-level measures are captured in individual component projects. BBIC will support data and evaluation across the project portfolio, establishing baseline metrics where necessary and assessing progress toward goals and objectives.

Hub Goals	Illustrative Metrics <i>(see projects for detailed metrics)</i>
Position Birmingham to be the central “biotech hub” of an accessible precision medicine and innovation ecosystem to realize emerging biotechnologies.	Enrollment, completion, and placement rates for biotech training programs, sq ft commercial wet lab and incubator space developed, sq ft workforce training space developed, \$ invested in biotech startups supported by Hub programs
Attract private-sector investment to Birmingham to expand discovery and commercialization of emerging biotechnologies, generating jobs and economic growth throughout the state and region.	Regional capital expenditures of firms headquartered outside the MSA, # new biotech companies, # new SEBI-owned biotech companies, # good direct and indirect jobs created
Build a globally unique, diverse biobank that enables accessible precision medicine to improve public health outcomes, accelerates drug discovery, and drives clinical trial investment among Black and rural populations in the Deep South.	# global companies securely accessing biobank, # and % growth in patient genomes sequenced (esp. Black, rural, and other underrepresented groups), # and % growth in underrepresented patients enrolled in clinical trials, annual growth in clinical trial expenditures, # patients enrolled in clinical trials, annual # and % growth in clinical trialists employed
Advance biotechnology towards innovative solutions for supply chain resilience and national and economic security.	# biotech applied research projects moving across the lab-to-market pipeline, % change in regional share of biotechnology innovations advanced through TRL 9 in the U.S.

## 9. Conclusion

Addressing chronic disease borne from systemic health inequalities is consequential for America’s national security, global diplomacy, and economic competitiveness. Birmingham is America’s best hope for meeting this challenge while forming the nexus of a Southern regional bioeconomy. With unique proximity of internationally renowned R&D institutions that excel in AI-driven drug discovery, clinico-genomic data on diverse, disease-burdened patient populations, and commercialization-enabling investments, the Hub is poised to become the global leader in precision population health. Implementation funding will enable the Hub to double the regional biotech workforce in a decade by paving a unique path to clinical trial investment and attracting, supporting, and growing early-stage companies that will leverage regional assets to address health disparities.