

## **1. Synopsis of Vision, Initiatives, Partners and Outcomes Expected**

The Oklahoma City Economic Development Foundation (the Foundation) and its regional partners are committed to advancing the region's bioscience cluster as an integral means of augmented investment into a more diversified, resilient, and inclusive economy across the 10-county Greater OKC Region (the region) through partnerships spanning key Oklahoma communities including Tribal Nations.

A focus on biosciences cluster development has been an ongoing regional economic development strategy since the late 1980s and early 1990s when community leaders conceived and launched the Presbyterian Health Foundation Research Park in Oklahoma City's (OKC) growing medical district. By 2005, the effort took a broader regional but more industry focused approach with the completion of the 2005 Battelle comprehensive biosciences strategic plan, known as *Bio Ready, Bio Strong*, that envisioned a new Bio-corridor along I-35 connecting assets from Stillwater, OKC, and Norman. This strategic vision continues today, with the goal of establishing bioscience as "a key driver for the region's economy, providing a high rate of return measured in high wage jobs, high quality health care, and career opportunities for the region's talent base, with internationally recognized strengths in select areas and offering a place where agile entrepreneurs continually turn ideas into well-capitalized firms that are among the leaders in their industry segments."<sup>1</sup>

Much progress has been made since the early 2000s to ensure the Greater OKC region has in place the fundamentals of a growing industry base and sizable research enterprise needed to advance a competitive bioscience cluster. Bioscience industries require a close relationship between basic and clinical research activities (found largely at academic research institutions) and industry. Detailed studies have found that nearly 80% of transformative new drug innovations over the last 25 years were the result of collaborations among industry and academia, with industry dominating the development, clinical trials, and manufacturing phases of the R&D process.<sup>2</sup>

Over the past two decades, the region has made great strides building a strong biosciences foundation to support additional investment. Since 2001, the biosciences cluster – comprised of academic medical and health organizations and non-clinical biomedical industries – recorded nearly double the rate of job growth of the total private sector in the region, growing by 25% from 2001-2020 compared to 13% for the total private sector. Even on the national stage, the past decade of bioscience employment growth in the region has been strong – with the Greater OKC region posting a 19% job gain compared to a 14% increase nationally. Today, the regional biosciences industry cluster stands on par with the nation regarding employment concentration with over 4,300 non-clinical, industrial biosciences jobs across 477 business establishments.

Academic and biomedical institutional R&D in the Greater OKC region also continues to advance. Biomedical-related research among the region's universities and OMRF totaled \$258 million in 2020 compared to \$108 million in 2001, while NIH funding – the gold standard of biomedical research – rising from \$119 million in 2020 from \$50 million in 2001. Of particular note is the strong growth of the Stephenson Cancer Center (SCC) at the University of Oklahoma Health Sciences Center (OUHSC) that complements the established research efforts across the University

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<sup>1</sup> Excerpt of Vision Statement from Greater OKC Chamber, *Bio Ready, Bio Strong: Briefing Report*, 2005, pg 6.

<sup>2</sup> Tufts Center for the Study of Drug Development, *Public and Private Contributions to the R&D of the Most Transformational Drugs of the Last 25 Years*, January 2015.

of Oklahoma (OU), Oklahoma State University (OSU) and Oklahoma Medical Research Foundation (OMRF). Through the combined support of the State, University of Oklahoma, OUHSC health systems and private philanthropy, the SCC has recruited over 50 PhD scientists and 40 new physician scientists over the past 10 years. This has led to dramatic growth in research funding and was critical to achieving NCI designation in 2018 – an external marker of the quality research occurring at the Center. Since achieving NCI designation SCC researchers have garnered almost \$200 million in Federal cancer research dollars.

New investments in Central Oklahoma’s bio cluster expands needed capacity in research activities while fostering existing industry partnerships and new firm formation. The “valley of death” between research discoveries and new product development is a significant barrier to high-growth new venture formation in the region. Despite a sizable research base, the region’s level of “translation into innovation” is quite low. Since 2010, the annual average number of NIH-funded Federal Small Business Innovation Research (SBIR) Awards, a key metric for product innovation by emerging small businesses, averaged just seven per year for the region, with no year having more than 10. Additionally, the average annual number of deals in biopharmaceutical-related venture capital (VC) since 2010 stands at just slightly over 3 per year and funding at \$15 million per year, far below national levels when viewed on a normalized basis.<sup>3</sup>

Unlike incumbent innovation hubs with more complex commercialization frameworks on both the East and West Coasts, a key constraint to increasing local bioscience velocity is a lack of translational resources, which limits the development of new biopharma products. With the continued success of programs at the OU Stephenson Cancer Center and the needed responses for pandemic testing and surveillance being undertaken by OSU at the Oklahoma Pandemic Center for Innovation and Excellence (OPCIE), the region has a “once in a generation opportunity” to advance industry-facing infrastructure intentionally supporting new industry collaborations and new firm formation.

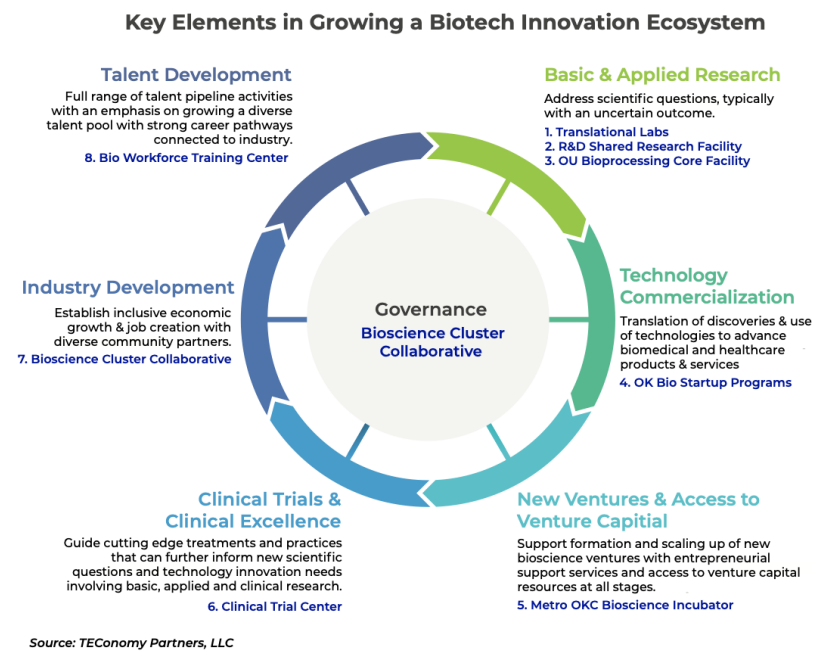
**After 25 years of building the Greater OKC region’s bioscience industry, the region is at a critical inflection point for scalable and equitable growth.** Supported by the Economic Development Administration’s Build Back Better Regional Challenge (EDA BBBRC), the Foundation and more than 50 ecosystem partners propose the Oklahoma Biotech Innovation Cluster Initiative (OBIC). OBIC investment harmonizes R&D, production, and clinical trial management, key aspects of technology development, under the umbrella of a well-positioned and low-cost market postured to rapidly expand its bioscience and biomanufacturing cluster.

The OBIC coalition is led by the Foundation, an entity supported by the Greater Oklahoma City Chamber (a regional economic and community development organization serving the 7 county Oklahoma City MSA and 3 additional counties) and supported by more than 55 partners across academia (e.g. OU, OUHSC, OSU, OMRF, CareerTech), tribal nations (e.g. Chickasaw Nation, Cherokee Nation), government (e.g. Association of Central Oklahoma Governments, OK Secretary of Science and Innovation, OK Department of Commerce), industry (e.g. Wheeler Labs, Cytovance, IMMY), community (e.g. OKC Innovation District, Norman Economic Development

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<sup>3</sup> Based on an analysis of data from PitchBook, SBIR.gov, and NSF’s HERD survey, and administrative data from OMRF, the Greater OKC region has generated, on average, 0.7 VC deals per \$100M in academic R&D vs. a national average of 1.3 deals; the region has generated 1.5 SBIR awards per \$100M in academic R&D vs. a national average of 2.8.

Coalition), investors (e.g. i2E, Echo Investment) and other key stakeholders across the product development continuum. These partnerships support initiatives across a unique urban-rural region to foster inclusive access to high-wage career pathways, increase R&D programs and partnerships, and expand critical scientific infrastructure. Specific investment types are described below.



- PROJECTS**
- Center for Developmental Therapeutics:** Infrastructure of shared-use facilities & labs to attract leading translational scientists to advance development & commercialization of new therapies & support increased industry collaborations.
  - R&D Shared Research Facility:** advance innovations in pandemic prediction, sensor development, lab on chip technology, and identification of new therapeutic targets using the extensive biospecimen data repository complemented by computational resources & bioinformatics expertise.
  - OU Bioprocessing Core Facility:** Cost-effective, sustainable access to advanced bioprocessing technologies for scaling-up the translation of biopharmaceutical drug discoveries for pre-clinical & clinical testing. It will provide educational programs for developing high-demand bioprocessing engineering talent.
  - OK Bio Startup Programs:** Integrated with physical infrastructure support through the Bio Incubator & other regional wet lab resources, this offers supportive programming to build a vibrant startup pipeline across OBIC.
  - Metro OKC Bioscience Incubator:** This 20,000 square foot incubator offers startups shared office and wetlab space.
  - Clinical Trial Center:** This would double the size of the existing clinical trial program broaden its focus beyond cancer for experimental therapies in disease areas.
  - Bioscience Cluster Collaborative:** Provides a governance infrastructure to encourage regional connectivity & spur a synergetic industry network. Offers programmatic resources to facilitate & incentivize collaborations across projects.
  - Bio Workforce Training Center:** Establishes a workforce training center to meet the growing demand for skilled biomanufacturing technicians & will enable the formation of inclusive, non-degreed career pathways into high-wage jobs.

*Basic and Applied Research* investments (the R&D Shared Resource of OPCIE, the Oklahoma Center for Developmental Therapeutics, and the OU Bioprocessing Core Facility) involve biospecimen collection and analysis using advanced data sciences to provide insights into high value therapeutic approaches, expand clinical trials capacities from the earliest phases of new therapeutic development, new drug development capacities with critical research cores to conduct pre-clinical research, and testing required for successfully developing new drug therapies. *Clinical Trials and Clinical Excellence* investments through the Oklahoma Phase I Clinical Trial Center support expanded biomanufacturing capacity at the pre-clinical and Phase I clinical trials stages to advance novel experimental drugs.

*Technology Commercialization* and *New Ventures and Access to Capital* is supported by the Oklahoma Biotech Startup Program (OKBio Startup) and the Metro OKC Biosciences Incubator in Norman, Oklahoma (MOCBIN). OKBio Startup, led by the OU Tom Love Innovation Hub, an EDA University Center, provides a comprehensive suite of support programs accelerating the commercialization of university research and the growth of new biotech startups by 1) building a diverse, equitable, and inclusive biotech startup community; 2) providing training to start-up concepts to evaluate technical needs (e.g., technical, financial, legal, regulatory, etc.); and 3) efficiently scaling viable concepts with access to early phase funding (e.g., NIH SBIR). These funded startups will find a home at MOCBIN, a 20,000 sq. ft. biotech incubator in the Norman Economic Development Coalition (NEDC) owned Advanced Manufacturing Center of University North Park, adjacent to I-35 and IMMY.

As an overarching effort to establish *Governance* and focus on *Industry Development*, the Bioscience Cluster Collaborative (BCC), led by the Oklahoma City Economic Development Foundation, will take a pro-active role to advance access and collaborations in the region's

expanded translational research infrastructure. Opportunities include pairing existing biopharmaceutical companies with industry collaborators and researchers to facilitate applied research, matching grants and other shared deliverables. To support relationships, the BCC will identify and partially fund staff at translational research centers to serve as “site miners” providing key contact points to facilitate relationship between collaborators.

Of particular importance for equitable opportunity in the region is workforce and *Talent Development* capacity to place biomanufacturing as a cornerstone of cluster activities. Federal investment, complementing local investment into OBIC initiatives, also addresses U.S. domestic liabilities in supply-chain biomanufacturing capacity. As the nation seeks to strategically diversify its sources of critical goods production, Central Oklahoma offers a cost-effective hub for next-gen medical developments. The region is already emerging in biopharmaceutical manufacturing with industry growth rising from a mere 185 jobs in 2010 to over 700 jobs in 2020. This growth is reflected by the demand for talent found in regional job postings, where several Greater OKC biomanufacturing companies—such as Cytovance Biologics and Avara Pharmaceuticals—have yielded 192 unique job postings in the last 2 years, with much of this talent in “middle-skilled” production and manufacturing positions.<sup>4</sup> Two projects of OBIC address this workforce and talent need—the OU Bioprocessing Core Facility and Biopharmaceutical Workforce Training Center—with the former focused on skilled technicians needed for biomanufacturing and the latter developing high-skilled engineering talent. The Workforce Center will position OBIC as part of a national training cohort alongside four other states (DE, NC, LA, MD) supporting biomanufacturing workforce development.

In pursuing specific investments while reinventing the region’s biosciences cluster, OBIC strengthens the overall innovation ecosystem by connecting the component parts of a high functioning industry cluster. OBIC understands the requirement for strong links between universities and industry to advance biotech/biosciences development with mechanisms to foster commercialization of university-based research and advance industry collaborations. These links are essential to connect research and industry in the distinct and unique stages of development across basic, translational, new product development and clinical testing. OBIC supports these linkages while taking an ecosystem view of partnerships. This level of engagement recognizes the importance of “connectivity” across research, commercialization, new venture and product development with cluster growth spanning activities from technology development to clinical trials to advanced manufacturing and distribution.

OBIC has effectively aligned its vision to the ACOG CAPEDD Comprehensive Economic Development Strategy, Key Findings from the ACOG CAPEDD CEDS included the following:

- **Uneven Development:** Growth and investment have not been evenly distributed.
- **Vulnerability to Economic Disruption:** The region’s historic dependence on oil and gas and climate-related vulnerabilities have been an impediment to economic growth.<sup>5</sup>
- **Lagging Growth in Innovation:** While many exciting innovations are emerging, the region has lagged behind peer markets on innovation-related indicators.

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<sup>4</sup> Emsi Job Posting Analytics Database, 2022.1 data set.

<sup>5</sup> In a recent report, Oklahoma’s oil and gas sector was found to support nearly 17% of total state jobs, highest for any state, see: PwC, “Impacts of the Oil and Natural Gas Industry on the US Economy in 2019,” July 2021.

OBIC efforts also aligns with objectives from the State of Oklahoma’s 2021-2026 Science and Innovation Strategic Plan emphasizing the need to “grow the region’s startup, entrepreneurship, and business innovation ecosystem,” increase the ratio of traded-to-local industry, and target investment in a life science “supercluster.” In addition, OBIC investments support several regional economic studies, including OU and OSU strategic plans and three different regional city plans emphasizing economic growth and resilience.

Outside of the core activities of the integrated industry value chain that OBIC fosters, the cluster also aligns with crosscutting supports, including education systems, oversight, and public investment. The creation of the OKCID, MAPS reinvestment, new OCAST R&D programs, and recent VC-focused legislation (e.g., SB 915, SB 922) are examples of complementary initiatives aligning with OBIC objectives.

Timing of key OBIC project milestones are described below:

- **Sept – Dec 2022:** Phase II awards made. Construction projects begin. Non-Construction programs begin hiring & training, equipment bids/purchases and finalize program design.
- **June 2023:** OKBioStart first cohort of Concept program.
- **Early 2024:** Innovation Hall opens, begin facility and equipment commissioning workforce training center, first training cohort starts.
- **Fall 2024:** Bio Incubator, Clinical Trial Center & Translational Lab construction complete. Bio Incubator start to fill occupancy & SCC projects begin ordering equipment.

In summary, OBIC has targeted eight interrelated investments, unifying the product development pipeline from translational research to testing and manufacturing while providing undergirding support (workforce, entrepreneurial start-ups and industry partnerships) to bolster the bioscience innovation ecosystem value chain. Most importantly, OBIC not only provides critical new industry-facing research infrastructure, but also takes an integrated project and coalition approach to effectively link research infrastructure investments into local economic development efforts, entrepreneurial support programs, and regional development strategies.

## **2. Project Location and Region**

The **Oklahoma Biotech Innovation Cluster (OBIC)**—a 70-mile corridor connecting Norman, OKC, and Stillwater, OK—is well-positioned to meet developmental needs for EBPs and to wrap commercial support around academic and applied researchers. The OBIC core value is building regional collaboration between existing research/commercialization partners and building a surrounding support structure that more fully engages regional communities. Through coordinated and comprehensive investments in infrastructure, workforce, entrepreneurial support, and cluster planning, OBIC will boost local capacity to **better support next-gen drug developers** and become more favorable for **future research and startups within the region**. The Greater OKC region includes 10 counties: Canadian (FIPS: 40017); Cleveland (FIPS: 40027); Grady (FIPS: 40051); Kingfisher (FIPS: 40073); Lincoln (FIPS: 40081); Logan (FIPS: 40083); McClain (FIPS: 40087); Oklahoma (FIPS: 40109); Payne (FIPS: 40119); and Pottawatomie (FIPS: 40125). The EDA lists Payne as “Persistent Poverty” (rate greater than 20%).

OBIC’s projects will be geographically distributed across the region with a hub in OKC and its academic medical centers, research park and burgeoning innovation district and spokes connecting

to leading universities, incubator facilities, and research park assets, found in Norman and Stillwater. Key crosscutting activities involving entrepreneurial support services, industry partnership programs and workforce training will be co-located across the hub and spokes.

### **3. Expected Participation from Private Sector Entities**

Below is a non-inclusive sampling of sector partners who will be active OBIC participants:

- **Oklahoma Medical Research Foundation (OMRF):** An internationally recognized research institute, their discoveries have yielded hundreds of patents and three life-saving drugs available in hospitals around the world. OMRF leadership will serve on the advisory board of the BCC and partner with several cluster projects (see BCC Narrative, pg 3).
- **Cytovance Biologics:** Cytovance is a biopharmaceutical contract manufacturing company that also offers process development, cell banking, and support services. Committed to growing the industry pipeline, Cytovance is partnered with the two workforce projects.
- **Alloy Therapeutics:** Through joint ventures—including shared R&D lab facilities—Alloy collaborates with OBIC institutions via preferred manufacturing, clinical trials, etc. This creates a flow of molecules from around the world into Oklahoma.
- **Tetherex Pharmaceuticals:** Tetherex is a local clinical-stage drug development company developing therapeutics for inflammatory and oncologic diseases. Tetherex recently executed an exclusive worldwide license with Mayo Clinic for the development and commercialization of a vaccine platform.
- **ARL Bio Pharma:** ARL provides analytical and microbiological testing for the pharma industry. Their team has extensive regulatory expertise and can provide comprehensive analytical and microbiology testing and pharmaceutical testing. This aids the cluster's integrated development platform through toxicology, PK/PD, analytical validation, etc.
- **IMMY:** IMMY manufactures innovative lines of diagnostic tests and reagents. IMMY affords opportunities for OBIC product developers to spill over from medicines into companion diagnostic offshoots.
- **Wheeler Bio:** Wheeler is a contract development and manufacturing organization (CDMO) that serves emergent biopharma companies, which typically lack consistent and timely access to high-quality biomanufacturing. Wheeler has committed to hiring 121 new technicians/operators from workforce programs and will provide technical support to both the training center and bioprocessing core facility.
- **Avara Pharmaceutical Services:** Avara is a contract manufacturing service offering established facilities, capabilities, and experience needed to supply large-scale commercial products globally. Avara offers commercial services like sterile fill-finish, specialty packaging, and sterilization.
- **Robinson Park Investments:** Robinson Park is a national full-service commercial real estate management company headquartered in OKC. They are building Innovation Hall, a 400,000-square-foot mixed-use project within the OKC Innovation District which will house the Bio Workforce Training Center.
- **Echo Investment Capital:** Echo is a multidisciplinary investment firm that has deployed over \$1.2B in capital and returned over \$300M in 11 years. Echo life sciences VC fund (O-Bio Fund I) leverages a large deal flow network, partners with groups like Mayo Clinic, Georgia Tech and Purdue, and plugs early-stage biotech companies into OBIC assets.

- **i2E:** i2E provides both proof-of-concept grant funding and makes early-stage equity investments. In biotech alone, i2E has invested over \$33M in 204 companies, seeding some of Oklahoma’s most successful therapeutic and device companies.
- **Oklahoma Life Science Fund (OLSF):** OLSF is an early-stage VC fund whose portfolio companies have raised over \$400M in VC funding, over \$2B in corporate co-development funding, and realized exits of over \$1B for 5 companies. OLSF companies generated over 800 jobs, with incomes 3x greater than state average.

#### **4. Sustainability of OBIC**

Sustainability and long-term economic impact are the cornerstone of OBIC’s BBBRC projects and continued ecosystem development. There are substantial and readily available matching funds from public and private entities to support each component investment and the cluster’s overall vision. The spillover results of successful execution will include increased biomedical research activity and company formation, as well the scaling of existing companies, producing outsized economic impacts for job and wage growth, investment returns, and industry diversification.

***Private Sector Support:*** Strong private sector commitment will ensure sustainability of the cluster. Current funding partners include the Oklahoma Life Science Fund, i2E, Echo Investment Capital, and Cortado Ventures. Companies like Echo Investment Capital have pledged support for the cluster to create joint community return. Example Echo investments include Deka Biosciences funding alongside Bayer and Lumira, who jointly elected to conduct clinical trials and manufacturing in Oklahoma City. Echo’s O-Bio fund has also committed to invest in cluster institutions to further develop and strengthen the local life sciences ecosystem.

Partnerships with industry will drive recurring revenue to create sustainable businesses. Projects including the OU Bioprocessing Core Facility and the Oklahoma Biomanufacturing Workforce Center will be sustained by fees from courses for undergraduate and graduate students, usage fees for R&D from researchers and industry partners and revenue from training of industry personnel and hires. The R&D Shared Resource services include processing of preclinical and clinical samples from partners, development of new molecular and genomics based clinical assays, educational materials, programs, and informatics tools. The OU SCC Clinical Trial Phase I program is now self-sustaining through a long history of contracts with pharmaceutical companies, grants, clinical income and philanthropy. Existing resources include a team of 3 physicians and 30 research staff who have a national and international reputation for quality and timely work. The OBIC’s budget request will allow OU SCC to double its current phase I capabilities by repurposing clinical space to support clinical trials.

***State Support:*** Agencies like OCAST—a coalition partner of this cluster—and the Oklahoma Department of Commerce and Office of Science and Innovation routinely lend funding and support to bioscience initiatives in the state. The Office of Science and Innovation’s 2021-2026 Strategic Plan includes Biotech and Life Sciences as one of only three target industries for state investment in higher education, technology transfer, workforce development, and infrastructure. OCAST recently secured \$81.6M in Treasury SSBCI funding in the form of loans and VC investments to support these projects. OCAST will also issue RFPs to lending organizations to target the socially and economically disadvantaged individuals (SEDI)-owned companies.

***Central Oklahoma Support:*** OBIC leverages OKC’s recent reinvestments under the Metropolitan Area Projects Plan (MAPS). MAPS is a multi-year, municipal capital improvement program financing transformative economic development. The most recent iteration of MAPS reinstated a 1% local sales tax, to be used to finance 16 separate projects, totaling \$978M in new investment, over 8 years. This package includes over \$71M in new investment to implement the vision of the OKC Innovation District. One project, a 25,000 square foot Innovation Hall facility, received \$10M in funding, matched by \$10M raised from non-MAPS sources. This facility will reserve 7,500 square feet for OBIC’s workforce center. Revenue from tuition, corporate sponsorships, and partnerships with other national training centers will also ensure sustainability.

### **5. Engagement of Community-Based Organizations and Labor Unions**

The OKC region has experience in leveraging the strengths of nonprofits, private corporations, and local government to further inclusive growth. For example, OKC was recently named by the Kansas City Federal Reserve as a pilot “Recovery Community,” fostering collaboration between 10 community development organizations to create an equity and growth plan for serving minority-owned businesses. The BCC, led by the Greater OKC Chamber through the Foundation, will act as the connective tissue of the cluster, driving community-facing programming, partnership structure development, and convening. Regularly highlighting diverse thought leadership in research, corporate engagement, and workforce relationships will be paramount to successful programming. Key partners include the Chickasaw Nation, Cherokee Nation, Urban League of Oklahoma City, OKC Black Chamber and Latino Community Development Agency. Finally, OBIC will follow labor standards and hiring provisions with Oklahoma AFL-CIO, a federation of 230 local labor unions that represent over a hundred thousand working people.

### **6. Ensuring Benefits of the Cluster Are Shared Equitably**

Maximizing the impact, growth, and economic durability of the OBIC is only possible if there is intentional focus on diversity, equity and inclusion (DEI). The Bioscience Cluster Collaborative governance focuses inclusivity throughout all OBIC activities. While strategies have been deployed and investments made in the past to produce more equitable outcomes in Central Oklahoma’s economy, the OBIC more fully incorporate equity into a high-growth industry to produce healthier, wealthier, and more resilient communities.

#### ***Ensuring Equity in Talent Development and Industry Development***

OBIC cultivates deliberate workforce development pathways to create middle-skill, living wage employment in traditionally underserved communities. Poverty rates and unemployment levels in Innovation District neighborhoods (home to multiple OBIC initiatives) are persistently above 45%<sup>6</sup>. The Workforce Training Center specifically works to address disparities by increasing entry and mid-level biotech talent, including creating collaborations with Chickasaw Nation Work Study programs. Program graduates are estimated to earn over \$48,000 per year on average without the requirement of a 4-year degree. The program is partnered with Work Ready Oklahoma, an organization funded on Federal TANF dollars to work with low-income families.

Universities involved with OBIC also have a strong commitment and track record in supporting diversity in its faculty and staff hires. Over the past 5 years, 65% (20 of 31) of MD and PhD research faculty hired into OU SCC have been women (55% at OU SCC, compared to 35% nationally among

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<sup>6</sup> Cited in the Brookings 2017 report pg 33 ([source](#))



NCI designated cancer centers) or under-represented minorities (16% in NIH categories of Black, Hispanic, or American Indian at OU SCC, compared to 6% nationally). Of the 458 SCC research employees, 76% are women and 38% are under-represented minorities. Of the 177 staff currently involved in clinical trials activities, 40% are minorities and 82% are female. Of the 1,362 instructional faculty at OSU, 43% are women and 22% are under-represented minorities.

Additionally, universities involved in OBIC have a specific focus to recruit, retain and train a diverse student body. Approximately 35% of the OU Gallogly College of Engineering student base are under-represented minorities (including a substantial representation of Native Americans) and 25% are women. OSU has the largest Native American student enrollment in the U.S. and ranks as one of the top three American Indian bachelor's and doctoral degree producers in the nation.

### ***Ensuring Equity in Technology Commercialization and New Ventures and Access to Capital***

OKBio Startup is focused on DEI and connecting biotech startup communities along the I-35 corridor. Using OUHSC as an example, 69% of their 3,238 enrolled students are female, and less than 18% are Caucasian males. Unfortunately, a dramatic majority of the startup successes connected with OUHSC do not reflect similar demographics. The OBIC Startup Community program will focus on bridging this gap by engaging more women and underrepresented students, staff, and faculty through a mix of inclusive programs (e.g., OK-WISE, diverse founder panels, etc.) and engaging existing campus and professional groups. The Tom Love Innovation Hub's OK Catalyst programs have had demonstrated success with similar outreach efforts: 76% of companies receiving SBIR/STTR funding due to the program have founders who are female, are veterans, and/or are socially or economically disadvantaged.

### ***Equitable Basic and Applied Research and Clinical Trials and Clinical Excellence***

Another dimension of equitable benefits related to OBIC is in the critical need for health equity, especially in a state that ranks in the bottom 10 for mortality in cancer, heart disease, diabetes and other diseases. Increasing access to clinical trials ensures greater access to potentially lifesaving medications in underserved populations. As a national leader in DEI, the Clinical Trial Center increases access to therapeutics and medicines, including through clinical trials enrollment, that will benefit all populations, including urban, rural, and racial minorities. Existing metrics include enrollment to trials by race, ethnicity, income, insurance status, rural, age and gender, with enrollment targeted at levels equal to or higher than overall patient population prevalence.

OPCIE also collaborates with health science organizations in Oklahoma to find solutions to public health problems. The R&D Shared Resource helps address health equity with the Cherokee Nation, and their partnership with the public health lab helps study and control disease outbreaks to optimize the ability to respond to public health crises in Oklahoma and across the nation. This relationship allows for the detection of emerging diseases, transmitted infections, and harmful environmental pathogens – a crucial part of providing timely and reliable information that is needed for effective disease prevention and control, especially in response to epidemic threats.

### ***Ensuring Equity in Tribal Support & Partnerships***

OBIC is committed to increase inclusion for Tribal groups. The Chickasaw Nation will play a vital role on the advisory board for the governing body of OBIC, the Bioscience Cluster Collaborative (BCC). The Clinical Trial Center will also collaborate with Indian Health Services for medicine

exposure and the Workforce Training Center is developing partnerships to foster career pathways and educational support programming with Tribal partners. The Cherokee Nation is committed to work with OBIC projects to advance opportunities in STEM, entrepreneurship, and career pathways in the biotech industry.

### **7. Outcomes Expected**

The expected outcomes involve the overall strengthening of the innovation ecosystem leading to sustained biosciences industry growth in the region with an intentional and systematic focus on diversity, equity and inclusion. This includes:

- *Translational Research* – growing the number of invention disclosures and industry-sponsored research collaborations with disproportionate presence of under-represented groups of faculty
- *Technology Commercialization* – increased patent innovations, licenses with new and existing companies and SBIR awards
- *New Ventures & Access to Venture Capital* – number of new startups commercializing academic research, number of under-represented entrepreneurs leading new companies, number of startups receiving VC, and scale-up of startups (growth in jobs and revenue)
- *Clinical Trials* – increased number of early phase clinical trials across disease areas of need in Oklahoma and disproportionately serving under-represented groups of patients, increased number of Principal Investigator-led clinical trials, and increased industry collaborations
- *Industry Development* – growth of biopharmaceutical manufacturing industry and related industries such as biopharmaceutical commercial research and testing
- *Talent Development* – training and hiring of faculty, graduate students, undergraduates, and new entry-level and incumbent workers across all projects with a disproportionate impact on under-represented groups

### **8. Work Conducted by OBIC Between Phase I Award and Phase 2 Application Submittal**

The coalition used this time to take a deeper examination of biosciences industry trends, talent needs and overall innovation ecosystem areas of strengths and weaknesses to help inform and focus the activities on each project. Leaders across the proposed 8 projects engaged in a series of discussions weekly to identify ways to increase horizontal integration and break existing silos. As a result, the OBIC Cluster Collaborative project became the hub to create governance that engages stakeholders and ensures oversight of projects, which serve as the spokes, while also using this initiative to establish the programmatic means of ensuring accountability to ensure economic development results and DEI priorities. Additionally, OBIC hired TEconomy Partners as a third-party consultant to assist in the review and validation of the proposed projects, independently and collectively, and look at the entire ecosystem to position OBIC and Oklahoma City for growth and sustainability long term. TEconomy is recognized as a national leader in advancing biotech strategies across basic translational research enhancement, technology development, new venture development, talent development, business development, and for measuring the economic impacts of life science and related clusters and investments.

The total budget for all OBIC projects is \$68M, with over 20% in matching funds. Beyond the matching, OBIC has secured over \$11.75M in additional support to leverage, including \$10.5M in philanthropic funds to support staff and laboratory support for the Clinical Trial Center and Center for Therapeutics, \$1M for operations of the Bio Incubator, and \$258.4K in resources from Work Ready Oklahoma.