

BIOSCIENCES STRATEGY

Montgomery County's strategy
for developing a world-
renowned life sciences industry



December, 2009

Introduction

The life sciences are a key component of Montgomery County's economy. In 2008, the County's biosciences industry generated combined revenues of \$2.36 billion¹. It directly employed more than 9,200² workers in the private sector and an estimated 49,000³ in federal government agencies. The average private sector biotech salary was \$92,945 - double the County-wide average.

In the 1980s and 1990s, the County government made strategic investments to attract and grow this life sciences cluster, including the donation of land and buildings to help the University System of Maryland (USM) and Johns Hopkins University (JHU) establish an academic presence in Montgomery County. County leaders recognized the quality of life dividend and multiple benefits these investments would bring to Montgomery County: well-paying jobs; an increased tax base⁴ to bolster the County's nationally regarded public services, education system and infrastructure; and enhanced health care for County residents.

Maryland Governor Martin O'Malley has made the growth of the state's biosciences sector a top priority for his administration. The recently released Life Sciences Advisory Board's *BioMaryland 2020* strategic plan lays out a series of priority strategies and actions for the state to realize its vision of making Maryland a nationally and globally recognized leader in the biosciences.

Montgomery County is the epicenter of Maryland's bioscience industry and will be a critical partner in achieving *BioMaryland 2020's* ambitious objectives. This is demonstrated by the decision to locate one of two branches of the new Maryland Biotechnology Center here. The County is home to over 250 of the state's 380 plus bioscience companies, and key federal research and regulatory institutions including the National Institutes of Health, the Food and Drug Administration, the National Institute of Standards and Technology and the Walter Reed Army Institute for Research. As noted above, Montgomery County also hosts satellite campuses of top academic research institutions JHU and the USM (including its Center for Advanced Research in Biotechnology), as well as Montgomery College, a nationally renowned community college.

Yet while Montgomery County is the region's undisputed biotech leader, it is not growing at a rate commensurate with its inherent potential. The County faces unprecedented competition as other U.S. regions and countries around the world invest hundreds of millions of dollars to cultivate their biosciences sectors. The current global biotechnology market is estimated to be \$106 billion⁵ with an annual growth rate of 25 percent; by 2015 it will have more than doubled in size⁶. To remain competitive in this global environment, Montgomery County needs to advance its own agenda to become an internationally recognized center for translational research and commercialization in the biosciences, and must play a significant role in the implementation of the *BioMaryland 2020* strategy.

¹ Maryland-National Capital Park and Planning Commission (M-NCPPC)

² Ibid

³ Ibid

⁴ The Milken Institute report *The Greater Philadelphia Life Sciences Cluster 2009: An Economic and Comparative Assessment* estimates that the Philadelphia region's multiplier impact is 2.6 –each \$1 of income directly attributable to a life science company generates an additional \$1.6 in income in other sectors.

⁵ Steven Burrill, BIO 2008 Presentation

⁶ Business Insights: The Biotechnology Market Outlook, Gayle Hamilton

To that end, in the fall of 2008, County Executive Leggett established a Biosciences Task Force to help develop a strategy that will enable Montgomery County to more effectively leverage its rich asset base and become a global hub for life science research, development and technology commercialization. Over the past year the task force, comprised of local biotech executives and state, federal and academic leaders, has met six times to identify the strengths and weaknesses of Montgomery County's biosciences sector, articulate a vision for its future and craft priority strategies. Key objectives, strategies and proposed actions, summarized in the following sections, will enable the County to realize its vision and ensure a high quality of life for all County residents.

Strategic Vision

Montgomery County will enhance its position as a globally recognized leader in advancing bioscience research and development, and in translating scientific discoveries into commercially available products that benefit human health.

The County's Department of Economic Development (DED) plays an important role in supporting the biosciences sector by providing strategic planning and financial assistance to start-up companies to help foster and sustain their growth. Department staff work with bioscience companies of all sizes to support their information, networking, space and related needs. In addition, DED pro-actively fosters relationships with federal agencies,

industry groups, venture capital firms and other life sciences stakeholders, and supports a range of professional and networking opportunities to bring these groups together.

The department will play a leading role in coordinating the implementation of the strategies laid out below, working in close partnership with a new Montgomery County Bioscience Leadership Group (see page 10 for additional information).

Key Opportunities and Challenges

The task force identified a number of opportunities and challenges facing Montgomery County's biosciences industry:

Significant federal presence, but a risk-averse culture and lack of entrepreneurialism: The major presence of federal research labs, the National Institutes of Health and the Food and Drug Administration is one of Montgomery County's strongest assets. However, the resulting strong imbalance between private sector and federal bioscience jobs (9,200 private sector workers vs. an estimated 49,000 in federal government agencies) is a double-edged sword that has fostered a more risk-averse and regulatory-oriented culture than in entrepreneurial, university-oriented bioscience hubs like California and the Boston area. Montgomery County can learn lessons from these and other competitive regions about cultivating an environment that better attracts and supports serial entrepreneurs, strong management teams and venture capital, and that rewards risk takers.

Montgomery County has been a pioneer in the creation of business incubators to foster the development and success of early-stage bioscience and high tech companies. Today, the County's Business Innovation Network is comprised of five facilities that currently house 140 businesses (as well as 21 'virtual' tenants), including 38 biotech companies. The Network has graduated over 95 companies that have an estimated workforce of 1,600 at an average salary of \$75,000.

To further spur the creation and growth of innovative bioscience companies, biotech hubs in other regions are augmenting their support networks through public-private 'innovation intermediaries.' These intermediaries bring together the financial resources of VC investors with experienced management teams to pluck pioneering research from universities and other research institutions and accelerate the creation of bioscience companies based on these technologies. What differentiates this 'accelerator' model from traditional business incubators is the combination of promising science, committed private sector capital and seasoned management teams collaborating to cultivate entrepreneurialism and accelerate the commercialization of new technologies.

Translational research, technology transfer and commercialization: A recent study of ten life science clusters around the U.S.⁷ identified technology transfer and commercialization as common challenges. Montgomery County is home to the National Institutes of Health, the National Institute of Standards and Technology and a number of other federal labs, and branches of the USM and JHU, which receives more federal research dollars than any other university in the U.S. While all of these institutions are engaged in groundbreaking scientific research, they conduct relatively little translational research, and there are a number of barriers to effective industry-university and industry-NIH technology transfer and commercialization. NIH's conflict of interest rules, in particular, have placed tight restrictions on scientific collaboration with the private sector, and have greatly reduced the flow of technology out of NIH in recent years.

⁷ *Organizing for Economic Development: Lessons from Leading Life Sciences Regions, July 2007* – prepared for Detroit Renaissance by BDA/Center for Regional Competitiveness

Compounding this, licensing university technologies is viewed by some companies as a challenging and lengthy process, and practices vary from institution to institution. Greater transparency and mutual understanding between businesses and tech transfer offices of their respective needs and expectations is required to facilitate the process. Technology licensing works best when there are both entrepreneurs who can identify promising technologies and internal and external brokers with a business background to facilitate the dialogue with federal and university tech transfer offices about licensing agreements.

Improving the technology transfer process and focusing on the commercialization of promising research must be top priorities to grow Montgomery County's biosciences sector and make it more globally competitive. Strong leadership is needed to break down silos and build more effective partnerships between universities, industry and government agencies to expedite the commercialization of innovative technologies. The UMBI Patent Review Board, UMB-JHU Alliance and Partnership Intermediary Agreements with the U.S. Department of Agriculture's Agricultural Research Services Division offer promising models for further development.

Creating a more robust university research presence in Montgomery County must also be a priority. USM's reorganization of the UMBI Center for Advanced Research in Biotechnology (CARB) at Shady Grove will bring the scientific expertise and technology transfer operations of the University of Maryland College Park and the University of Maryland Baltimore Schools of Medicine and Pharmacy into Montgomery County. It will result in a bigger faculty presence, greater research productivity, a larger numbers of graduate and postdoctoral students and expanded partnerships with federal agencies and industry.

To accelerate the commercialization of promising scientific research, it is critical that hospital and university leaders view clinical trials, translational research and tech transfer as part of their core mission. JHU's recent purchase of Suburban Hospital in Bethesda will establish a stronger research presence of its School of Medicine within Montgomery County. Both USM and JHU have indicated their plans to promote and expand clinical trials activities in Montgomery County and work closely and strategically with the county in support of greater research and development in the biosciences. USM recently established a \$3.5 million, federally funded "Proof of Concept Alliance," focused on Department of Defense technologies. Consideration should be given to using this model, working with NIH, FDA, USM and the Maryland Congressional delegation to support life sciences technology transfer in the County and region.

Access to capital: Greater capital is needed at all phases of the biotech development spectrum. There is a particular dearth of seed and venture capital funding for early stage companies. VC leaders have observed that "money finds good ideas." However, VC funding has an inherent bias towards later stage technologies that promise greater returns for investors, and most federal and university research conducted in the region is geared towards basic scientific discoveries. Increased funding is also needed for translational research to take ideas from discovery to proof of concept and to prepare promising technologies for VC funding.

Talent and enhanced workforce capacity: Montgomery County has one of the highest per capita numbers of PhDs in the country. However, the Task Force identified a deficit of managerial/executive talent and seasoned serial entrepreneurs as key impediments to the County's biotech competitiveness. This correlates to the region's relative dearth of investor capital: VC funding often brings entrepreneurial and managerial talent with it. Because of the highly specialized knowledge involved, there is also a need for greater training and recruitment to ensure a robust pipeline of biosciences workers at all levels of the skill continuum.

Regulatory environment: Since 2005, NIH Conflict of Interest rules have prohibited NIH scientists from engaging in outside consulting with biotech and pharma companies, creating a chilling effect on public-private collaboration. The rules have fostered a culture in which NIH scientists are less commercially oriented and their research is less commercially ready, so relatively little NIH research gets translated into products that improve public health. The lengthy - and extremely costly - FDA drug review and approval process also serves as a major barrier to entry into the biosciences arena.

Maryland is perceived of as less business friendly than some of its competitors with regard to tax rates, financial incentives and the cost and ease of doing business. Forbes Magazine's 2009 state rankings placed it at No. 12 overall as a place to do business (Virginia was No.1 for the fourth year running) - but No. 42 for business costs. The *BioMaryland 2020* strategy acknowledges some of these challenges, and offers a number of recommendations for addressing them. At the County level, the Planning Department's development review and Department of Permitting processes are viewed as lengthy and difficult to navigate.

Public policies at the local, state and federal levels must facilitate and support the growth of high-tech bioscience businesses, including direct incentives, facility investment, infrastructure investments, enhanced tax credits and more supportive government regulatory processes. A 2007 study of ten U.S. life science clusters⁸ found that the co-location of research facilities and technology assets can bring significant benefits in terms of jobs and tax revenues, and a number of regions are pursuing ambitious real estate development projects with universities to facilitate this co-location.

⁸ Ibid

Key Objectives and Strategies

The Task Force identified five overarching objectives and a number of priority strategies to achieve the strategic vision articulated on Page 4.

Objective 1: Enhance the environment for entrepreneurship and the creation of new life science companies.

- I. Create a public-private partnership to augment the County's nationally recognized Business Innovation Network with an 'accelerator' that brings together the capital resources of leading VCs with top managers, scientists and entrepreneurs to evaluate, finance and manage the development of promising life science start-ups. The Seattle Accelerator⁹ and Cleveland BioEnterprise¹⁰ are two potential models.
- II. Court VC firms that have investments in Montgomery County-based biotech companies to open satellite offices in the County.
- III. Create incentives to recruit serial entrepreneurs, technical experts and seasoned management professionals from other regions.
- IV. Support local venture capital firms' Entrepreneur in Residence programs¹¹.

⁹ The Accelerator Corporation is a vehicle for investment in and management of emerging biotechnology opportunities. Located in Seattle, it brings together the resources of top-tiered investors, dedicated management and a world-class research institute to identify, evaluate, capitalize and manage emerging biotechnology companies. Collectively, they bring extensive experience to the complex and costly process of transforming laboratory discoveries into commercial products. By providing their expertise to companies in the Accelerator portfolio, these industry leaders provide critical knowledge and resources that can help to streamline the development and accelerate the commercialization of novel technologies. The Accelerator has access to exciting new technologies and commercial opportunities developed at leading research institutions, universities and biotechnology companies around the world, enabling it to select only the most compelling investments from a deep pool of promising opportunities (source: <http://www.acceleratorcorp.com/>).

¹⁰ BioEnterprise is a business formation, recruitment and acceleration initiative designed to grow health care companies and commercialize bioscience technologies. Its founders and partners are Cleveland Clinic, University Hospitals, Case Western Reserve University, Summa Health System and the BioInnovation Institute in Akron. The initiative comprises the collective activities of BioEnterprise and its partners' commercialization offices. Companies include emerging medical device, biotechnology, and health care services firms. Each year, the BioEnterprise groups choose a select number of companies to focus on, and the resources and networks of its partners are directed to help them achieve greater levels of business success. BioEnterprise provides companies with experienced bioscience management guidance; relationships with world-class research and clinical institutions; access to bioscience venture capital and private equity firms as well as knowledge of grant funding opportunities; business development and alliance support for strategic partnerships; a network of regional business capabilities including technical services, equipment and professional service providers; and flexible development space (source: <http://www.bioenterprise.com/>).

¹¹ The EIR model is used by VC funds to bring on board entrepreneurs for a period of one-two years. During this time, the entrepreneurs evaluate potential deals for the VC and look for a company to start or invest in, which they would run as CEO. NEA currently has an informal program in place.

Objective 2: Catalyze greater technology transfer and commercialization and leverage Montgomery County's federal and academic assets more effectively.

- I. Identify viable strategies to address NIH's conflict of interest regulations and to foster greater technology transfer and commercialization of NIH research.
- II. Work with USM, JHU and other regional academic research institutions to facilitate greater licensing and commercialization of their research discoveries and technologies.

Objective 3: Foster a more enabling financial, regulatory and business environment.

- I. Pass County enabling legislation to create a Montgomery-County specific biotech investment tax credit by summer 2010.
- II. Work with MdBio/Tech Council of Maryland (TCM), Montgomery County's state delegation and the state legislative biotechnology caucus to reintroduce legislation that would allow early-stage Maryland bioscience companies to take tax deductions against net operating losses
- III. Work with DBED, MdBio/TCM, Montgomery County's state delegation and the state legislative biotechnology caucus to make the state's existing R&D tax credit permanent¹² as well as refundable or transferable, which helps early stage companies that do not yet have taxable profits.
- IV. Develop the legal infrastructure for Montgomery County to take an equity investment interest in bioscience companies that receive County funds.
- V. Create an expedited review and approval process for qualified bioscience projects and equalize permitting costs with other types of commercial development. Work with the Planning Department and community stakeholders on land use issues, in particular sector plan and zoning code updates, to ensure optimal use of land for the life sciences.
- VI. Pro-actively pursue public funds (local, state, federal) for the facilities, equipment and related infrastructure necessary to support science and technology development.
- VII. Facilitate access to capital and strategic alliances. Identify and pre-screen investors interested in specific research areas, facilitate guided introductions, co-sponsor networking opportunities and increase support for mechanisms to connect entrepreneurs with VC and partnering opportunities.
- VIII. Engage local biotech executives as ambassadors to cultivate relationships with large pharma, VCs and international biotech companies. Market Montgomery County to these companies as a place to do business, and promote partnering, investment and acquisition opportunities with County bioscience companies.
- IX. Evaluate the full spectrum of creative financing vehicles that have been successfully implemented in other jurisdictions around the country that could be replicated in Montgomery County.

¹² The program is currently slated to sunset in June 2012.

Objective 4: Enhance bioscience educational opportunities in Montgomery County and expand the higher education presence in Montgomery County to build a robust biosciences workforce and foster commercialization.

- I. Support partnerships between Montgomery College, other higher education institutions, industry and Montgomery County Public Schools to support STEM (science, technology, engineering and math) curriculum development, enhance STEM teacher preparation and expand “laboratory” programs designed to spark student interest in and preparation for health science and bioscience careers.
- II. Support efforts by USM, JHU and other academic and privately funded research institutions to expand their research presence, clinical trials and technology transfer activity in Montgomery County in order to facilitate greater drug discovery, licensing of applied technologies and business growth.
- III. Work with state, academic and private sector partners to seek increased federal/state funding for Montgomery County’s workforce programs, and strengthen education and workforce training opportunities in biomanufacturing, clinical research, biotechnology and related skills through partnerships between Montgomery College, federal laboratories, MdBio/MdBio Foundation¹³ and other industry based organizations.

Objective 5: Market Montgomery County’s bioscience sector nationally and internationally.

- I. Create a recognizable brand that differentiates the Montgomery County bioscience sector nationally and internationally.
- II. Partner with the Maryland Biotechnology Center to develop a high-profile marketing effort that complements the state’s BioMaryland branding and global marketing campaign.
- III. Strategically target international biotech companies that are poised for U.S. market entry.

¹³ The MdBio Foundation trains high school students in its mobile lab, makes scholarship grants and participates in a number of other educational initiatives in the biotech arena.

Action Plan:

The County's Department of Economic Development (DED) will lead the development of annual work plans and guide the implementation of the strategy. A new, private sector led Biosciences Leadership Group will monitor strategy outcomes and provide the County with ongoing guidance on industry needs and opportunities. The formation of this high-profile group and the definition of its roles and responsibilities will be a critical first action initiated by DED.

Strategy: Establish a Montgomery County Biosciences Leadership Group of private and public industry leaders to monitor progress in strategy implementation and results and to provide guidance on changing biotech needs and opportunities. Designate one or more DED staff as the department's bioscience business development specialist(s).

Actions:

- Develop a short list of proposed senior leaders from private biotech industry, academic research institutions, industry organizations, key federal agencies, state and County government and send out invitation letters.
- Convene an introductory meeting to lay out expectations and goals for the leadership group.
- Select one or more DED staff as the department's bioscience business development specialist(s); notify County biotech companies and partner organizations.
- Develop annual strategy implementation work plans/benchmarks for review and input by the leadership group.
- Hold regular meetings of the leadership group to review progress in achieving annual benchmarks and longer term objectives, and to provide expert input on industry trends, changing needs, etc.
- Partner with MdBio, the Maryland Biotechnology Center and other stakeholders to convene periodic industry focus groups to identify the special needs of key biosciences sub-sectors.

Suggested Timeline: Short-term – ongoing

Objective 1: Enhance the environment for entrepreneurship and the creation of new life science companies.

Strategy: Create a public-private partnership to augment the County's nationally recognized Business Innovation Network with an 'accelerator' that brings together the capital resources of leading VCs with top managers, scientists and entrepreneurs to evaluate, finance and manage the development of promising life science start-ups.

Actions:

- Research public-private models and governance structures that have been used successfully in other jurisdictions to help identify an appropriate model for Montgomery County.
- Work with select partners in the real estate, biotech and VC communities to identify the necessary capital and human resources needed to bring the accelerator concept to Montgomery County, and determine how County government can most effectively support a private sector-led initiative to establish an accelerator.
- Explore linking accelerator resources with JHU and USM research and technology transfer capabilities, USM at CARB in Shady Grove and USM entrepreneurship networks.

- Utilize the new accelerator as a vehicle to proactively engage with industry to identify commercialization opportunities from their research, and to transfer technologies out of public and private research institutions in other regions.
- Develop metrics to assess the accelerator's performance (e.g., how many accelerator companies become revenue generating businesses, are acquired, etc.).

Suggested Timeline: Short – medium term

Strategy: Court VC firms that have investments in Montgomery County-based biotech companies to open satellite offices in the County.

Actions:

- Research which VCs that invest in biotech have equity in Montgomery County based companies, using sources including the Maryland Biotechnology Center's databases and local VC contacts.
- Meet with local companies and ask for their help in making introductions to their VC investors.
- Approach the Mid-Atlantic Venture Association to seek assistance with introductions to its members.
- Develop an incentive package and marketing piece to attract VCs to Montgomery County – e.g., free/reduced cost space in County's Business Innovation Network.
- Arrange meetings with targeted VCs.

Suggested Timeline: Ongoing

Strategy: Create incentives to recruit serial entrepreneurs, technical experts and seasoned management professionals from other regions.

Actions:

- In partnership with biotech companies, VCs and other bioscience stakeholders, develop a short list of key positions/job descriptions where there is an identified deficit of talent.
- Meet with financial institutions and other businesses that have a stake in the County's biotech sector to gauge their interest in participating in an initiative to attract talent.
- Evaluate the fiscal impact to the County of potential financial and/or other incentives that could be used as tools to attract proven talent.
- Enhance partnerships with the USM and JHU business schools, which offer bio-business skills for doctors and research scientists.

Suggested Timeline: Short – medium term

Strategy: Support local VC firms' Entrepreneur in Residence programs.

Actions:

- Meet with leaders from local VC firms to discuss mechanisms through which the County can support existing informal Entrepreneur in Residence programs and help launch new ones.
- Based on the outcome of this dialogue, take appropriate follow-up actions.
- Research entrepreneurial programs (private sector and academic) in other regions to identify best practices in fostering greater entrepreneurship in the biosciences.

Suggested Timeline: Short – medium term

Objective 2: Catalyze greater technology transfer and commercialization and leverage Montgomery County's federal and academic assets more effectively.

Strategy: Identify viable strategies to address NIH's conflict of interest regulations and to foster greater technology transfer and commercialization of NIH research.

Actions:

- Continue to cultivate relationships with the NIH Public-Private Partnership Program (<http://ppp.od.nih.gov/>) and the Office of Technology Transfer (<http://ott.od.nih.gov/>). The Public-Private Partnerships Program was created in 2005 to develop collaborative research programs with the private sector within existing NIH rules and regulations, and can help foster new partnerships between NIH and Montgomery County bioscience companies.
- Team with other organizations (TEDCO, etc.) to raise awareness about the NIH Public-Private Partnership Program and NIH Foundation, as well as new initiatives within the NIH Office of Technology Transfer that could benefit the local bioscience community.
- Work with Maryland's congressional delegation to advocate that the NIH Public-Private Partnership Program is funded at a level to allow robust technology commercialization and facilitate partnerships in the region.
- Look to best practices at other federal laboratories (e.g., Sandia National Laboratory) as potential models for fostering greater public-private collaboration and tech transfer with NIH, NIST, etc.
- Work with the state of Maryland's new Federal Facilities Advisory Board to advocate that the role of NIH in local technology commercialization be one of the first topics the group addresses.
- Evaluate the feasibility of NIH replicating the CDC-Georgia Research Alliance program, which focuses on enhancing technology transfer and creating mechanisms that enable CDC researchers to engage with start-up companies.

- Create a Congressionally-chartered technology commercialization federal lab foundation. The foundation would help transfer internal research and development from federal labs to the private sector more effectively, and serve as a tool that laboratories could use to facilitate business and partnership transactions consistent with federal statutes ¹⁴.
- Actively participate in the spring 2010 National Academy of Sciences symposium, which will bring together federal, state and local leaders, private sector executives and academics to discuss how the U.S. can move the biosciences industry forward, using Montgomery County as a case study.

Suggested Timeline: Short – medium term

Strategy: Work with USM, JHU and other regional academic research institutions and private industry to facilitate greater licensing and commercialization of their research discoveries and technologies.

Actions:

- Facilitate USM efforts to expand the Center for Advanced Research in Biotechnology (CARB) at its Shady Grove campus through strong ties with the University of Maryland College Park and University of Maryland Schools of Medicine and Pharmacy.
- Work with JHU on development plans for its Belward campus in Gaithersburg West and its recent purchase of Suburban Hospital in Bethesda in order to foster expanded research and clinical trials in Montgomery County.
- Support efforts by USM and JHU and other academic and privately funded research institutions to expand their research presence, clinical trials and technology transfer activity in Montgomery County in order to facilitate greater drug discovery, licensing of applied technologies and business growth and identify specific actions to strengthen USM and JHU's partnerships with the County.
- Encourage the leadership of JHU and USM to evaluate other university technology transfer models and adopt best practices from those deemed most effective and efficient in licensing their technologies.
- Support *BioMaryland 2020's* recommendation for a comprehensive review of internal and extramural policies and procedures that affect university-private-sector collaboration for the development and commercialization of USM research discoveries.
- Encourage USM and JHU to incentivize faculty to perform applied research and engage in entrepreneurial activities through recognition and incentives for translational research and commercialization efforts, and conferring credit for patents, licenses and industry collaboration.

¹⁴ The Foundation's charter could allow for the assignment of federal researchers to work with private sector companies as part of their official duties in an open, managed, transparent process modeled on best practices from universities, non profit research institutes and private sector managed federal laboratories. The charter could also include a policy that allows federal researchers to take entrepreneurial leave to be involved in new bioscience start-ups to commercialize federal research discoveries. The foundation would be based on the federal government's land grant extension model, originally developed for public land grant universities, but extended to federal laboratories.

- Advocate in support of the *BioMaryland 2020's* recommendations for: 1) increased funding for TEDCO for technology transfer and proof-of-concept development projects; and 2) greater funding for the USM technology transfer office to recruit scientifically/commercially skilled technology transfer personnel and fund patent expenses and monitoring.
- Develop seed funding mechanisms for additional proof of concepts work by County companies for promising technologies from university research. The Philadelphia Science Center's new QED Proof-of-Concept program offers one model¹⁵.
- Partner with other public/private bioscience stakeholders to hold an annual one-two day meeting for tech transfer offices from around the country to present technologies available for licensing to VC and other investors.

Suggested Timeline: Short – medium term

Lessons from Ohio

- The Cleveland Clinic is a renowned not-for-profit academic medical center that integrates clinical and hospital care with research and education. Lab research is conducted through its Lerner Research Institute. The Cleveland Clinic Foundation Innovations is its technology commercialization arm, with a mission to 'benefit the sick through the broad and rapid deployment of CC technology.' The foundation facilitates innovation, creates spin-off companies, licenses technologies, secures resources and establishes strategic collaborations with corporate partners. This focus on tech transfer is fairly unique among major research hospitals.
- Case Western Reserve University has 'empowered' its tech transfer office and created Case Technology Ventures as its pre-seed stage VC fund for technologies coming out of the university.
- University Hospitals, a community based health care system serving northern Ohio, has a Center for Clinical Research focused on translational research. The Center combines federally funded research, sponsored research agreements with pharma, biotech and medical device industries and a partnership with Case Western Reserve University.

Source: Organizing for Economic Development: Lessons from Leading Life Sciences Regions, July 2007.

¹⁵ Philadelphia's University Science Center's QED Proof-of-Concept Program is intended to help bridge the gap between research grants and private seed investment. It will provide funding to help entrepreneurs, university researchers, and innovators to validate the scientific and commercial value of their projects, and enhance their investment attractiveness to established life science companies and private investors. QED was launched in the spring of 2009 as an 18-month pilot to demonstrate its value and feasibility as an independent, multi-institutional, scalable, and economically sustainable proof-of-concept program.

Objective 3: Foster a more enabling financial, regulatory and business environment.

Strategy: Pass County enabling legislation to create a Montgomery-County specific biotech investment tax credit by summer 2010.

Actions:

- Work with the County Department of Finance, Office of Management and Budget and Office of the County Attorney to craft and introduce County legislation.
- Once County legislation has been enacted, coordinate with the Office of Management and Budget and the Department of Finance to include funding for the tax credit in the County's next fiscal year budget, and to develop the necessary administrative procedures.
- Consider reserving half of the tax credits for university start ups to attract more university based research and entrepreneurial resources to the County¹⁶.

Suggested Timeline: Short – medium term

Strategy: Work with MdBio/TCM, the County's state delegation and legislative biotechnology caucus to reintroduce legislation that would allow early-stage Maryland bioscience companies to take tax deductions against net operating losses.

Actions:

- Meet with MdBio/TCM representatives and members of the state legislative biotechnology caucus to discuss previously introduced NOI legislation and develop an advocacy strategy for its successful passage.
- Review and revise, as necessary, the previous NOI bill and identify sponsors to introduce the bill in the 2010 session.
- In coordination with MdBio/TCM and members of the Montgomery County bioscience community, pro-actively lobby for passage of the bill.

Strategy: Work with DBED, MdBio/TCM, Montgomery County's state delegation and the state legislative biotechnology caucus to make the state's existing R&D tax credit permanent as well as refundable or transferable, in order to help early stage companies that do not yet have taxable profits.

Actions:

- Work with DBED and MdBio to make this part of TCM's legislative priorities and to develop an advocacy strategy.

¹⁶ Advocates for the Virginia bioscience industry won a significant victory at the Virginia General Assembly in 2009 with the passage of an "omnibus" bioscience bill. A key feature of the legislation is an investment tax credit targeted at bioscience and other advanced technology companies, especially start-ups from Virginia universities. The legislation limits the existing qualified equity and subordinated debt investment tax credit to bioscience and other advanced technology start-ups, and reserves up to 50 percent of the available credit for tech-transfer spin-outs from universities.

- Meet with members of the state legislative biotechnology caucus to identify sponsors for a bill in the 2010 legislative session to amend the existing state R&D tax credit legislation.
- In coordination with MdBio/TCM and members of the Montgomery County bioscience community, pro-actively lobby for passage of the bill.

Strategy: Develop the legal infrastructure for Montgomery County to take an equity investment interest in County bioscience companies that receive County funds.

Actions:

- Assess the existing legal framework that governs the ability of Maryland political subdivisions to invest in private companies.
- Identify the legislative actions and institutional mechanisms that would enable Montgomery County to benefit financially from investments (in the form of grants and loans) in County bioscience companies.

Strategy: Create an expedited approval process for qualified bioscience projects and equalize permitting costs with other types of commercial development. Work with the Planning Department and community stakeholders on land use issues, in particular sector plan and zoning code updates, to ensure optimal use of land for the life sciences.

Actions:

- Meet with biotech real estate experts and companies that have experience working with the Planning and Permitting Services Departments to identify specific issues/barriers and come up with possible solutions.
- Meet with senior staff from the Planning and Permitting Services Departments to discuss these issues and proposed solutions and to streamline development review and permitting. Introduce an expedited approval process for strategic projects.
- Actively engage in master plan updates (in particular Gaithersburg West and Germantown) to ensure optimal zoning for bioscience/mixed use developments.
- Assign a business development specialist in the Department of Economic Development to shepherd biotech projects over 5,000 square feet through the planning review and permitting processes.
- Continue to exempt biotech projects from impact fees and other County development surcharges.
- Develop an alternate permitting fee structure for bioscience facilities in recognition of their higher construction costs. Currently, permitting fees are based on total project costs, penalizing biotech projects that require costly laboratories, enhanced HVAC systems, etc.

Suggested Timeline: Short – long term

Strategy: Pro-actively pursue public funds (local, state, federal) for the facilities, equipment and related infrastructure necessary to support science and technology development.

Actions:

- Work with the County Office of Intergovernmental Relations to develop annual federal funding requests that prioritize bioscience related facilities, equipment and other infrastructure investments.
- Proactively engage with Montgomery County’s federal and state delegations to advocate for increased infrastructure investments that support the growth of the biotech sector.
- Appoint a DED staffer to track federal infrastructure spending on science and technology, identify funding opportunities and coordinate funding applications.

Suggested timeline: Ongoing

Strategy: Facilitate access to capital and strategic alliances. Identify and pre-screen investors interested in specific research areas, facilitate guided introductions, cosponsor networking opportunities and increase support for mechanisms to connect entrepreneurs with VC and partnering opportunities.

Actions:

- Use the Maryland Biotechnology Center’s databases to ferret out funding and partnering opportunities for County bioscience companies and match County biotech companies with them as appropriate.
- Pro-actively cultivate relationships with seed, angel, venture and other investors in biotech through attendance at targeted investor, financing and other networking events.
- Train DED staff in venture financing methods so that they better understand the needs of companies, how to structure deals and what types of finance are best suited to the needs of biotech companies at different stages in their development.
- Ensure DED staff understands the funding needs of local bioscience companies and can connect them with appropriate funders.
- Have DED staff present information about local biotech companies to financial professionals and potential partners at conferences and events that these companies cannot afford to attend.
- Organize/sponsor business plan assistance and coaching events for entrepreneurs. Organizations such as San Diego Connect’s Springboard (<https://www.springboardenterprises.org/>) can provide support.

Suggested Timeline: Short – long term

Strategy: Engage local biotech executives as ambassadors to cultivate relationships with large pharma, VCs and international biotech companies. Market Montgomery County as a place to do business and promote partnering, investment and acquisition opportunities with County bioscience companies.

Actions:

- In partnership with industry leaders, identify and articulate Montgomery County’s industry-specific strengths and weaknesses, and conduct cluster analyses to pinpoint strategic corporate targets that could enhance the quality and quantity of identified clusters.

- Meet with biotech industry leaders from other countries to assess their views on strategic business targets, and request their assistance with introductions to targeted company executives.
- Target international biotech executives at conferences, and arrange meetings when they are visiting the D.C. region.

Suggested Timeline: Ongoing

Objective 4: Enhance bioscience educational opportunities in Montgomery County and expand the higher education presence in Montgomery County to build a robust biosciences workforce and foster commercialization.

Strategy: Support partnerships between County higher education institutions, industry and MCPS to support STEM curriculum development, enhance STEM teacher preparation, as well as “laboratory” programs designed to expand student interest in and preparation for health science and bioscience careers.

Actions:

- Expand the presence of USM and JHU in Montgomery County with additional undergraduate and graduate degree programs in biosciences, bioengineering, computational biology, health and medical sciences and business degree programs specifically designed to support clinical research and industry development in Montgomery County and the broader region.
- Coordinate planning and expansion of higher education assets with the County’s Business Innovation Network and state initiatives.
- Support County-sponsored academic scholarships strategically designed to “grow our own” workforce in high demand areas including the sciences, health and technology fields. Initiatives such as the 2+2+2 career pathway programs between Montgomery County Public Schools, Montgomery College and the USM Universities at Shady Grove are exemplary examples.
- Support the enhancement of Montgomery College’s curriculum, partnership programs in the life sciences and science teaching facilities and the Science and Technology Park at the Germantown campus, in order to create a deeper base of students prepared for graduate and research opportunities at the university level.

Suggested Timeline: Ongoing

Strategy: Work with state, academic and private sector partners to seek increased federal/state funding for Montgomery County’s workforce programs, and strengthen education and workforce training opportunities in biomanufacturing, clinical research, biotechnology and related skills through partnerships between Montgomery College, federal laboratories, MdBio/MdBio Foundation and other industry based organizations.

Actions:

- As part of the proposed biosciences leadership group, establish a standing subcommittee on bioscience and engineering education. The subcommittee should include representatives of MCPS, Montgomery College, MdBio/MdBio Foundation, USM and JHU to support education, research and workforce interests.

- Coordinate efforts of all county-sponsored education and training organizations, including the Workforce Investment Board, MCPS-MC Cluster Advisory Boards and the Montgomery County Business Roundtable for Education in support of STEM and biomedical sciences initiatives.

Suggested Timeline: Short – long term

Objective 5: Market Montgomery County’s biosciences sector nationally and internationally.

Strategy: Partner with the Maryland Biotechnology Center to develop a high-profile marketing effort that complements the state’s BioMaryland branding and global marketing campaign.

Actions:

- Create a recognizable brand that differentiates the Montgomery County biosciences sector nationally and internationally.
- Explore opportunities to partner with the Maryland Biotechnology Center on joint marketing and branding efforts.
- Create a matrix that lists key marketing opportunities, trade publications and events and prioritizes them based on expected exposure, networking and cost.
- Attend priority industry events to market Montgomery County and local companies, as resources permit.

Suggested Timeline: Ongoing

Strategy: Strategically target international biotech companies that are poised for U.S. market entry.

Actions:

- Research which countries, and which companies in these countries, are most likely to be attracted to Montgomery County’s assets.
- Ensure a strong DED presence at industry events where targeted countries/international companies have a presence, in order to develop relationships with company representatives and educate them about the County’s strategic advantages.
- As resources allow, participate in key international industry conferences including BIO Europe, BIO Asia and BIOMED Israel. Use professional local consultants to set up high level meetings with targeted companies in host countries.
- Facilitate introductions and networking opportunities between County biotech companies and targeted international companies.
- Tailor marketing documents to specific international audiences and translate them into targeted languages including Chinese, Korean and Hebrew.
- Survey local biotech companies to ascertain their target international markets, and help connect them to state and other resources that can help achieve their goals.

Suggested Timeline: Ongoing

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