

The Economic Impact of the  
Institute for Hepatitis and Virus Research  
&  
Pennsylvania Biotechnology Center



**Pennsylvania Biotechnology Center**  
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## **I. Executive Summary**

The creation and development of business and innovation centers for the biotechnology industry have been designed to replicate the functioning hubs of the industry in the United States like Research Triangle Park, Route 128 in Boston, and South San Francisco. This design is intended to attract technology, talent, and capital into concentrated geographies to spur new discovery, business formation, technology transfer, and commercialization.

To be sure, biotechnology business and innovation centers can attract powerful synergies and resources under one roof which increases the opportunity for greater economic growth. While large scale efforts in these biotechnology hubs and others are often the examples touted in best practice studies, there are other good examples of successes on a smaller scale that are creating new economic growth opportunities.

One such effort is the **Pennsylvania Biotechnology Center** (the Center) in Doylestown, PA, which was created by the Hepatitis B Foundation and Delaware Valley College. It is both a translational research and business center for the Life Science industry. The Center is a unique model of economic development in that it conducts mission-oriented research, cultivates support from government agencies, and nurtures early-stage companies for the targeted outcomes of discovering better ways to treat diseases and grow the local, regional, and state economies.

Biotechnology companies can find support at the Center through wet laboratories, office space, shared equipment, and access to a variety of forms of financing for early-stage companies. However, the primary driver in this development to date has been the Institute for Hepatitis & Virus Research (IHVR). Formed in 2003, IHVR is the functional research and development arm of the Hepatitis B Foundation. The Hepatitis B Foundation provides the education, outreach, and advocacy for the chronic disease and IHVR carries out the mission-focused research and development. Beginning with the formation of the Center in 2006, where both organizations are now located, the vision for implementation was to establish a supportive environment for translational-focused research on hepatitis and infectious disease and to also support biotechnology ventures in the Greater Philadelphia region that has been rich in renowned scientific research for many years.

A high-level of success and achievement can be reported to date through this Economic Impact study. IHVR's prominent research endeavors has served as a catalyst for the recruitment of renowned research faculty, new business formation of both diagnostic and therapeutic companies, and the relocation of companies to the Center with existing synergies to the IHVR research. The strategic plan for the Center and research affiliates remains to conduct translational research, spin-out technologies from the research, support biotechnology ventures that grow the economic base of Bucks County and provide jobs for a highly-skilled and educated workforce.

**Impact Statement**

The total economic impact from the inception of the activity at the Pennsylvania Biotechnology Center less than three years ago is 537 jobs created or retained and a delivery of \$164.7 million in total economic impact to the Commonwealth of Pennsylvania.

**Total Economic Impact to Pennsylvania ..... \$164.7 million**  
**Total Jobs Created & Retained in Pennsylvania ..... 537**

## **II. Project Methodology**

### **Definition**

The definition of the total economic impact is the difference between the existing economic activity and the level of economic activity that would exist in the absence of the formation of the organizations and companies at the Pennsylvania Biotechnology Center, including the Institute for Hepatitis & Virus Research. The Center's presence has both spun-out companies as well as spun-in or relocated companies that have not previously been located in Pennsylvania or Bucks County.

Specifically, the economic impact is the sum of direct, indirect, and induced impacts on the economy. In this case, direct impact refers to the actual jobs and income created in the local economy from the organizations and businesses located at the Center. Indirect impacts refer to the second round of expenditures made by these organizations and businesses within the local economy. Induced impacts refer to the increased sales of goods and services in the local economy due to employees of these businesses living and working in Pennsylvania. Another way of expressing these impacts is that a dollar spent in any sector of an economy will generate additional dollars in other sectors, and that is precisely what this study has captured.

### **Methodology**

The Economic Impact of the Center is calculated by aggregating the spending activity or wages, research, product development, and other expenditures of the organizations and companies. In the case of the Center, this includes the initial rehabilitation of the physical infrastructure. The Center opened for business in 2006, so this analysis benchmarks the success since its inception. The primary impact, however, is from what has occurred from the overall output of the research organizations and companies.

To determine indirect and induced impacts, economic multipliers are applied to all expenditures that further increases income, jobs, and total economic activities to demonstrate the full economic output. The multipliers used are final-demand output multipliers that indicate the level of total regional output that result from an increase in expenditures in an industry.

The multipliers express the additional dollars spent by every extra dollar generated by companies and organizations located at the Center. The indirect and induced expenditures used in this report are derived by using the expenditures as inputs into a standard regional input-output model developed by the U.S. Department of Commerce, Bureau of Economic Analysis, and the Regional Input-Output Modeling System (RIMS II). The relevance of this analysis is provided due to the natural inter-industry relationships throughout the area of regional economic analysis.

### III. Total Economic Impact

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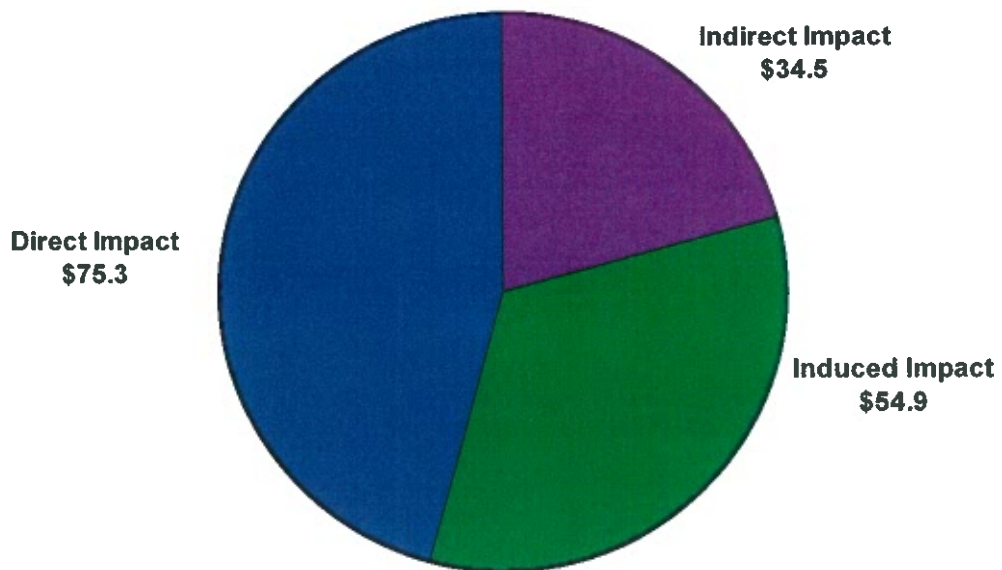
**Total Economic Impact to Pennsylvania ..... \$164.7**  
**Total Jobs Created & Retained in Pennsylvania ..... 537**

The economic impact can be classified into three categories, of direct, indirect and induced economic impact. To determine the economic output of PBC/IHVR, the appropriate multiplier for Pennsylvania and Bucks County is applied to each category of output and then totaled. According to the analysis, total economic impact equals \$164.7 million in Pennsylvania of which \$130.4 million is concentrated in Bucks County. Of these total direct expenditures accounted for \$75.3 million in spending output.

	Pennsylvania	Bucks County
<b>Total Economic Impact</b>	<b>\$ 164,695,486</b>	<b>\$ 130,428,412</b>
<b>Direct Economic Impact</b>	<b>\$ 75,321,498</b>	<b>\$ 75,321,498</b>
<b>Indirect Economic Impact</b>	<b>\$ 34,474,395</b>	<b>\$ 21,148,429</b>
<b>Induced Economic Impact</b>	<b>\$ 54,899,593</b>	<b>\$ 33,958,484</b>

### Economic Impact on Pennsylvania Pennsylvania Biotechnology Center 2006-2008

\$164.7 Million in Total Economic Impact



## A. Direct Economic Impact

Direct economic expenditures can be broken down further into three sub-categories of output: Facility Redevelopment, Research and Development, and Corporate Development. These categories best represent the lifecycle of activity at the Center since 2006.

Direct Output	2006-2008
Facility Rehabilitation	\$14.8 million
Research and Development	\$20.3 million
Corporate Development	\$40.2 million
	<b>\$75.3 million</b>

**Facility Rehabilitation:** Conversion of the property from a manufacturing facility to a Biotechnology Center took significant investment and manpower. Today, 22 wet laboratories spanning approximately 35,000 square feet and housing state-of-the-art research equipment are fully operational at the Center. Remaining space is a mixture of office and laboratory occupied by current corporate tenants and research staff. Due to the Center's roots as an industrial redevelopment project, there are still laboratories left to develop that will generate further local impact.



**Research and Development:** The Center is heavily focused on conducting mission-oriented research it houses in experimental therapeutics, biomarker and disease detection, and molecular pathogenesis with a special niche in virology research to impact hepatitis and other infectious diseases. The owner and developer of the facility, the Hepatitis B Foundation, is dedicated to finding a cure for the disease, which fuels ongoing research. The discovery research translated into patents and follow-on research grants is a sustainable generator economic impact which has generated \$20.3 million in direct impact since 2006.

The goal of bringing products to market from these research areas serves the public health mission of the Hepatitis B Foundation and serves as translational-focused pipelines with near-product potential.



**Corporate Impact:** Twenty-four for-profit companies currently occupy space at the Center. These companies are primarily Life Sciences companies ranging from biotechnology companies working on biomarkers, therapeutics, and vaccine development to companies working to design and develop medical devices for sales in U.S. and global markets. As of the end of 2008, these companies have generated \$40.2 million in total spending in the economy.

Many of the resident companies benefit significantly from the collaborative research undertakings at the Center where they can work jointly on scientific concepts and funding opportunities. Companies also benefit from the Center by accessing shared equipment, taking office space, and receiving introductions to a variety of forms of financing and incentives for early-stage technology companies. Many of the companies are working to raise capital for highly-intensive and costly clinical development.



Working to nurture and grow the resident companies at the Center will have a long-term impact on Bucks County and Pennsylvania. It is the Center's mission to grow companies from and supported by research and development. This effort in key disease areas is critical in sustaining long-term growth and to improving the shared quality of life in a world with limited natural resources and an aging baby-boom generation

## **B. Indirect Economic Impact**

The indirect and induced effects generated an additional multiplier in the economy. Multipliers were applied based on the type of spending and the subsequent impact on other industries. The primary industry sectors indirectly impacted by the activity at the Center are Professional, Scientific, and Technical Services, Facilities Support Services Construction and Management of Companies and Enterprises.

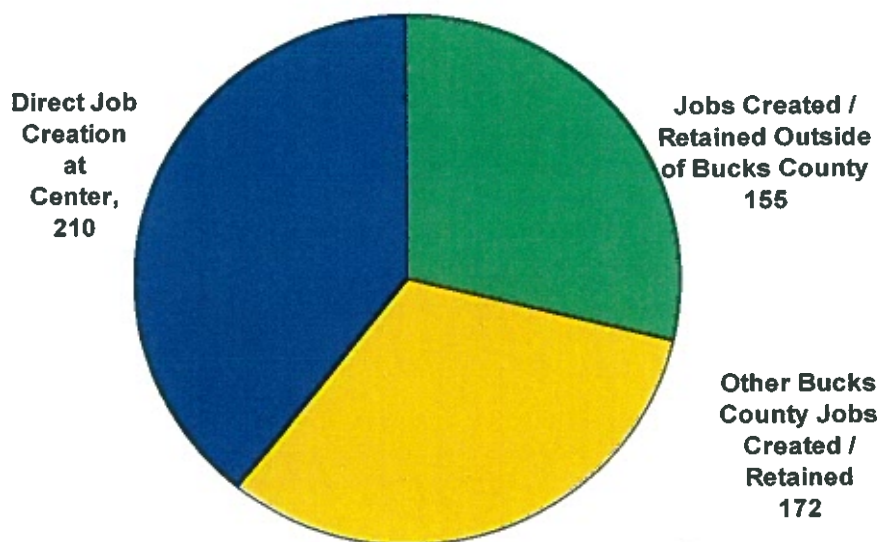
	<b>Pennsylvania</b>	<b>Bucks County</b>
<b>Indirect Economic Impact</b>	<b>\$ 34,474,395</b>	<b>\$ 21,148,429</b>
<b>Induced Economic Impact</b>	<b>\$ 54,899,593</b>	<b>\$ 33,958,464</b>

A calculated \$34.4 million of output (\$21.1 million in Bucks County) was generated by businesses and research organizations that supplied goods and services to the Center. Another \$54.9 million (\$33.9 million in Bucks County) was generated through induced impact. The induced impact includes labor income generated in Pennsylvania due to the induced effects of employees and the spending of their wages in the economy.

#### **IV. Employment Impact**

Prior to the creation and redevelopment of the campus at the Center, the buildings were owned by the DA Lewis manufacturing facility. The DA Lewis facility was in noticeable physical decline and displaced 130 local jobs over an eight-year period. Two years into the development of the Center, the integration of new companies, research institutes, and not-for-profits have made an impact on the local economy by creating 210 jobs. In addition, 172 Bucks County jobs are attributed to be created and retained through the indirect impact of output into the economy, and another 155 jobs retained in the Commonwealth of Pennsylvania outside of Bucks County.

### **Employment Impact Pennsylvania Biotechnology Center 537 Total Jobs Created / Retained 2006-2008**



Indirect job impact uses a calculation based on revenues received for goods and services rather than the expenditure methodology applied to the calculation of output and financial impact. This is due to the nature of biotechnology research and development industry not always leading directly to new products. Revenues generated at the Center total \$21.5 million during the study period expressed in 2006 dollars.

## **V. Future Impact**

The contents of this Economic Impact study contain information on the impact and growth of the Pennsylvania Biotechnology Center. Programs and service at the Center are designed to accelerate company formation through building off of the translational research enterprise.

Moving into its third year of development, the Center's activity has been funded primarily through research grants and investments into early-stage corporate development. The future plan for the Center is to continue the growth in translational research with a specific niche in virology. The approach is to build-out this hub in Doylestown with larger federal research projects and programs, attract the best researchers in this sector, and spin-out virology-based companies. At the same time, we believe that the activity in virology and supportive environment is advantageous for other entrepreneurs in biotechnology, medical devices, and other high-tech industries.

The ongoing vision is to weave an even stronger knowledge community with high-value workers and expand in Doylestown for the development of a technology corridor in Central Bucks County that will be known in the state and region for its high-tech atmosphere, which expands the opportunity for technology-based growth in Pennsylvania.

A strong step in this direction was the announcement in December 2008 that joining the Center in Buckingham Township is Fox Chase Cancer Center. The world-renowned research and cancer treatment organization is planning to build a high-tech radiation therapy facility in Buckingham, PA in what it envisions as the first in a series of new satellite offices. It will be located adjacently to the Pennsylvania Biotechnology Center and add high-tech jobs to the regional economy.



*The Bucks County Biotechnology Keystone Innovation Zone is among the twenty-nine designated zones in the Commonwealth of Pennsylvania. The Zone provides funding opportunities, tax incentives, and other economic and workforce development support to early-stage companies at the Pennsylvania Biotechnology Center (Doylestown, PA) and the Bridge Business Center (Bristol, PA).*

Acknowledgements:

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