



Pennsylvania Competitiveness in the Biosciences

Presented to the Democratic and Republican Policy Committees of
the Pennsylvania House of Representatives

By Christopher Molineaux

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Defining the Biosciences

- The biosciences are a diverse group of industries and activities with a common link—they apply knowledge of the way in which plants, animals, and humans function. The sector spans different markets and includes manufacturing, research activities and services.
- The biosciences industry sector is defined as including the following four subsectors:
 - Agricultural Feedstock & Chemicals (including bio-agricultural and bio-energy)
 - Drugs & Pharmaceuticals
 - Medical Devices & Equipment
 - Research, Testing & Medical Laboratories

Source: Battelle/BIO, State
Bioscience Initiatives 2008



Biosciences in Pennsylvania

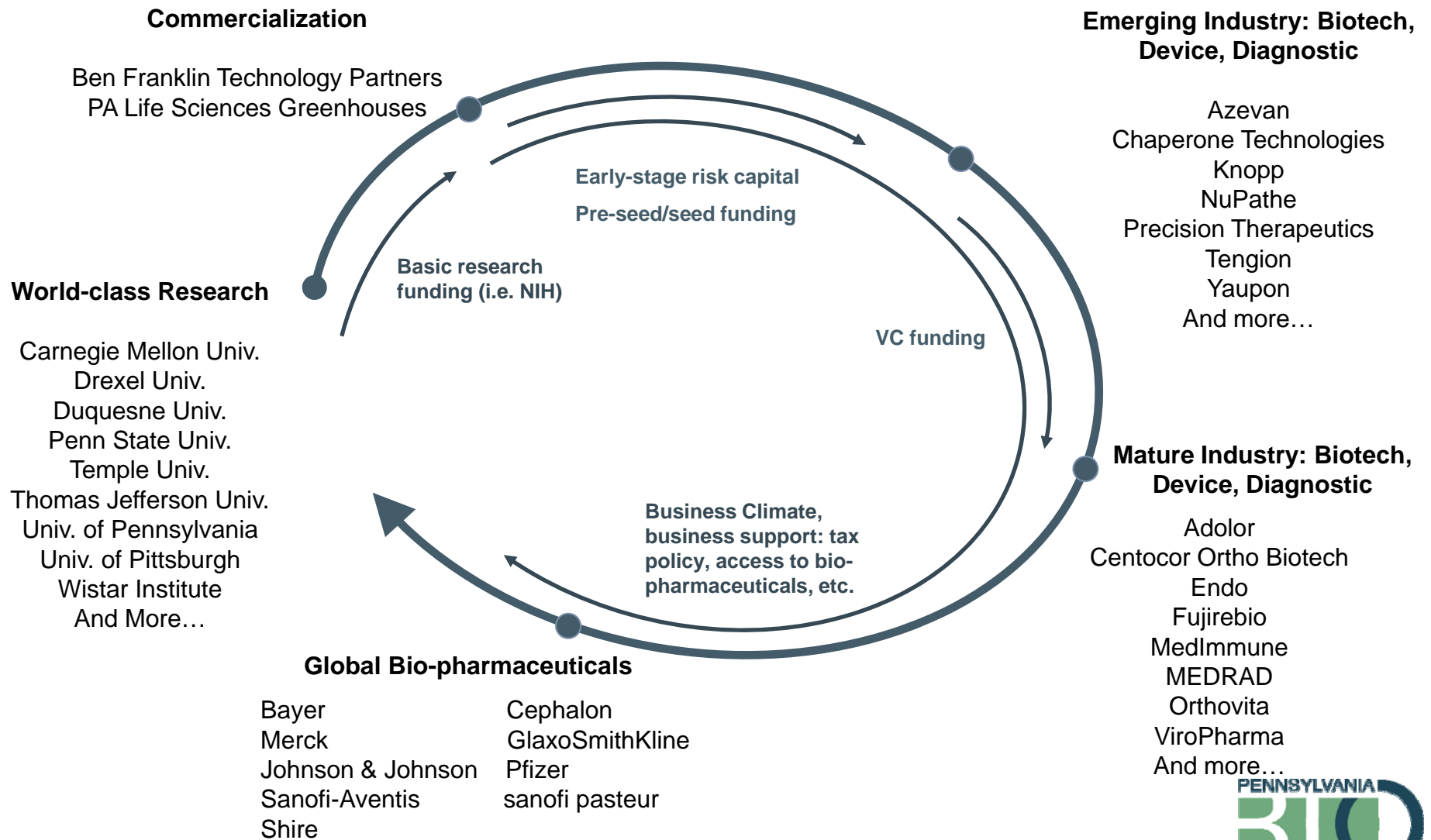
- Our competitive advantage:
 - Pennsylvania leverages outstanding local science and intellectual resources to create therapies, devices and diagnostics
- Our benefits:
 - The biosciences are transforming the economy: creating new companies, new jobs, and contributing to community growth



Pennsylvania's Strengths

- Located in heart of bio-pharma corridor = talented workforce pool and partners
- World-class academic/research institutions that garner substantial NIH funding
- Close proximity to NYC (financial markets) and Washington D.C. (U.S. regulatory base)
- Easiest springboard in the U.S. to the European markets
- High quality of life and a competitive cost of doing business
- Strong heritage of innovation
- Strong allied skills—ancillary industries and a robust service provider network
- Continuum of support from the Commonwealth

The Bioscience Continuum in Pennsylvania



The Biosciences in Pennsylvania

- The biosciences are a cornerstone of Pennsylvania's new economy
 - **80,929 direct bioscience jobs at 1,895 establishments**
 - drugs and pharmaceuticals; medical devices; agricultural feedstock and chemical; research and testing
 - **Nearly 355,000 total employment impact (4.38 multiplier)**
 - **Average employee salary of \$82,262**
 - Average total private sector wage in PA is \$44,000; national average is \$45,000
 - **\$6.7 billion in total wages**

Source: Battelle/BIO, State
Bioscience Initiatives 2010



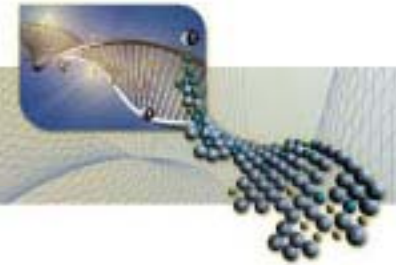
The Biosciences in Pennsylvania

- **Pennsylvania ranked among the top 5 states across additional key bioscience metrics:**
 - Academic R&D Expenditures
 - Bioscience R&D: \$1.6 billion (#4 nationally behind CA, NY and TX)
 - NIH Funding: \$1.7 billion (#4 nationally behind CA, MA and NY)
 - Bioscience Venture Capital Investments, 2004-2009: \$2.9 billion (#4 nationally behind CA, MA and NJ)
 - Bioscience-related Patents, 2004-2009: 5,041 (#4 nationally behind CA, MA and NJ)
 - Higher Education Degrees in Bioscience Fields, AY 2008: 8,390 (#5 nationally behind CA, TX, IL and NY)
 - Employment in Bioscience-related Occupations, 2008: 40,070 (#3 nationally behind CA and TX)
 - Clinical Trial Activity, 2009: 843 (#5 behind CA, TX, NY, and FL)

Source: Battelle/BIO, State
Bioscience Initiatives 2010



The largest 25 metro areas in the biosciences



Pennsylvania Research Strengths

- \$1.7 billion in NIH funding (2009, including ARRA funds)
- Two of the top 10 U.S. universities in NIH funding
 - University of Pennsylvania
 - University of Pittsburgh
- Five NCI-designated cancer centers
- Major R&D investment by industry



How do we compare?

- July 2008 *Business Facilities* Magazine: Pennsylvania #1 nationally in overall biotechnology strength:
 - Commitment to research funding (CURE)
 - Three regionally based Greenhouses that are “comprehensive centers for the commercialization of bioscience research”
 - “Depth and diversity”



How do we compare?

- But in July 2009, PA's ranking in *Business Facilities* dropped to #3 behind California and Massachusetts
- Reasons?
 - Other states outpaced PA in their investment in the industry



To Maintain PA's Leadership...

- Create an environment where innovation is understood and valued, and policies match the rhetoric
- Support the industry along the Continuum
 - From translation of research in the labs to start-up activity, commercialization and manufacturing
 - All steps along the continuum are critical to job creation and growth



Christopher P. Molineaux

President, Pennsylvania Bio



As president of Pennsylvania Bio, the only statewide association dedicated to advancing the biosciences industry in the Commonwealth of Pennsylvania, Christopher Molineaux serves as the chief advocate and spokesman for the biotechnology, device, diagnostic, pharmaceutical, research organizations and support network that call Pennsylvania home. Molineaux oversees the strategic direction for the association, assuring that Pennsylvania Bio continues to be the catalyst that makes Pennsylvania the top location for bioscience companies.

Molineaux brings to Pennsylvania Bio 20 years of experience in the biopharmaceutical and health care industries, with front-line experience in developing and executing strategies to navigate a shifting economic and political environment. He joined Pennsylvania Bio in 2009 as senior vice president for membership services, responsible for managing and enhancing the relationship between the association and member companies, and for developing and executing the strategic membership plan for the association's continued growth.

Prior to joining Pennsylvania Bio in September 2009, Molineaux served as worldwide vice president of pharmaceutical communication and public affairs for Johnson & Johnson. He began his Johnson & Johnson career as vice president of corporate communications at Centocor in Malvern and was later promoted into the role of vice president for communications of the company's global Biotechnology, Immunology & Oncology (B.I.O.) business unit. During his time with Johnson & Johnson, Molineaux served on the leadership teams and management boards for each division for which he worked. He helped to promote the company's advocacy agenda in the US and abroad, guided the communication of the company's value to government agencies globally, and worked to build public and investor awareness and understanding around the company's product and pipeline portfolio.

Molineaux previously served as vice president of public affairs at the Pharmaceutical Research and Manufacturers Association (PhRMA), where he worked on many critical industry issues, including the passage of a meaningful prescription drug benefit for Medicare beneficiaries (Medicare part D). Prior to this, he worked at the Blue Cross and Blue Shield Association developing public awareness and education strategies related to commercial and government payer systems and helping to reposition the Blue Cross and Blue Shield system of health care plans at a time when business organizations sought solutions to lowering health care costs. Molineaux also worked as a public affairs executive for both the federal Departments of Health and Human Services (HHS) and Agriculture, and on the White House staff of President George H. W. Bush.

Molineaux is co-chair of We Work for Health Pennsylvania and is on the board of directors of the Chester County Economic Development Council. He also serves on the Hershey Center for Applied Research Scientific Advisory Committee, the University City Science Center Community Development Committee, and the Health & Science Advisory Committee at WHYY in Philadelphia.

Molineaux lives in Wynnewood, PA with his wife and their three sons.

State of Venture Capital—Western, PA
Testimony by Gary Glausser
Partner and Chief Financial Officer
Birchmere Ventures

August 24, 2010

- Nationally VC investment declined from 2009 to 2008 from \$28B to \$17B and 30% in terms of the number of investments.
- During the same timeframe Pittsburgh VC investments declined 40% in dollars invested and realized a 25% decline in the number of VC investments.
- Philly witnessed a 43% decline in VC investment and a 29% decline in the number of investments.
- Nationally during 2009 \$17.6B was invested by VCs with PA receiving 2% or \$397M (including \$86M invested in the Pittsburgh region). In 2005, 2006, & 2007 PA received 3% of all venture capital investment---clearly moving in the wrong direction.
- Taking a deeper look at the Pittsburgh region: VC investment has fallen from \$178M-2007, \$149M-2008 and \$86M-2009.
- Angel investors are representing a higher % of the total dollars invested going from 6% of the \$177M invested to 15% of the \$86M invested in 2009. Deals like Alung, Cardio robotics, Clearcount and Thermal Therapeutics relied almost entirely in their early rounds of financing.
- It's great that angels like the Blue Tree Angel Group under Catherine Mott's stewardship have stepped in and provided the early seed and start-up capital needed for these companies. But in my experience investing in medical device and drug development companies \$50+ million is needed for a typical device company to get to cash flow break-even and well in excess of \$100+ million (sometimes \$300M as evidenced by Knopp Neurosciences \$345M partnership with Biogen) is needed to get a drug development through clinical trials and FDA approval.
- Angels don't have the deep pockets to continue moving many of these companies along and don't have the VC syndicate capabilities to assemble strong investor group.

- Our deal flow at Birchmere Ventures has been very strong over the past few years and we are approaching 50% of our log in life sciences companies (receiving ~650 deals per year from the Mid-Atlantic region). PA has built a great infrastructure with the Greenhouses and Be Franklin's to support these organizations---identifying promising technology, forming companies, mentoring founders & entrepreneurs, providing seed capital and connect them with investor group & Wall Street----but we need more institutional capital in the region to take these fledging companies to the next level. We need to get entrepreneurs off the fundraising trail and focusing on running & growing their businesses.
- Are things improving---according to the recent PWC MoneyTree report dated July 16,2010 they are. In the 1st half of 2010 VC investments totaled \$11.4B/1646 deals, representing a 49% increase in dollars invested and a 23% increase in the # of deals over the 1st 6 months of 2009. The strongest areas of investment highlighted were clean technology and life sciences.
- In Western PA VC investment for the 6 months ended 6/30/2010 totaled \$101M into 30 companies compared to \$86M for the entire 2009 and \$31M in the 1st half of 2009. But you need to look at the numbers comprising these totals. The majority of the \$101M is being invested in later stage or expansion stage deals---like Precision Therapeutics (\$35M Bain led Series D), Netronome Systems (\$23M), Foundation Radiology (\$5M), Landslide (\$8M), Modcloth (\$20M). Only 3% or \$3.5M was invested in Seed or Early Stage. This is were the financing GAP resides. The more mature companies with revenues or FDA approval are getting funded by VCs. But the Series A rounds are not being done by VCs. Pete Decomo Renal story.
- Do you think entrepreneurs are having a difficult time raising money, talk to the VC's themselves. YTD 6/30/2010 VCs raised \$5.6B on track to raise \$11B in 2010---It's the worse fundraising environment since 2003!! Just look back a few years VCs raised a lot more capital: 2005--\$29B, 2006--\$32B, 2007--\$36B, 2008--\$28B and 2009--\$16B.
- Locally, the VC firms that focus on the region---like Birchmere Ventures and Draper Triangle are almost fully invested. Pete DeComo and I have been trying to raise CVP for a one and one-half---a very difficult time as institutional investors are over-allocated to the alternative asset class.
- There's a good thing going on in the Venture industry---the VC business is contracting. You had all these funds started before the dot-com bubble and now their 10 years are up and the performance has been terrible returning over the past decade a whopping 2% internal rate of return. LPs that invest in VCs are trying to sort out the VC landscape---who to invest in and who not to invest in. What's the right allocation to VC?

- We believe from a VC perspective that it's not only Marcellous Shale we are sitting on that's a gold mine, but we are sitting on world class technology in our state and the region and we need capital to commercialize the most promising. Stats:
- PA receives 6% of all NIH (National Institute of Health and NSF (National Science Foundation) dollars for investment in our universities for R&D. Pitt ranks #4 in NIH and #10 in NSF, Penn ranks #?? MA receives 8% of NIH/NSF dollars and CA receives 14% of NIH/NSF dollars. If you compare to VC dollars invested, PA receives 2%, MA receives 11% and CA receives 50% of VC investment.
- We need to do a better job of commercializing our technology and I think we could accomplish by securing more venture capital for the region and educating more of our researchers and students to become more risk takers.
- Conclusion: on a national basis capital availability is improving, but for early stage companies its still and will be for quite some time a difficult fundraising environment for early stage life sciences companies.

GARY G. GLAUSSER

Mr. Glusser is a Managing Partner at Corridor Venture Partners, a targeted \$50 million early stage venture capital fund dedicated to making life sciences investments in medical device, diagnostics and healthcare IT companies. In addition, Mr. Glusser is a general partner with Birchmere Ventures, a fully invested venture capital fund with \$160 million under management. He is a past or current director of Advanced Software Applications, Be Here Corporation, Compucare Company, Metabolex, Inc., Precision Therapeutics, Renal Solutions, Inc., and Tissue Informatics.

Mr. Glusser has over 30 years experience in financial management, investing, lending, and public accounting. Mr. Glusser began his career at Price Waterhouse providing audit and consulting services to middle-market companies in a variety of industries. During his last five years at Price Waterhouse, his duties consisted primarily of providing analytical and negotiation support for clients during merger and acquisition processes. During this time, he was the creator, editor, and major contributing author of *Buying and Selling a Business*, a Price Waterhouse guide for executives of emerging, growth, and middle-market companies.

Mr. Glusser was previously with Westinghouse Credit Corp. where he held various lending, investing, and controller positions, leading investments exceeding \$200 million in a number of later-stage companies. He later became SVP/Controller for various investment portfolios totaling in excess of \$5 billion. Mr. Glusser was previously with Joy Technologies, a \$600 million mining equipment manufacturing firm, where he was responsible for analysis of potential merger acquisition candidates, consolidation of financial results, SEC reporting, maintenance of corporate policies, and procedures.

Mr. Glusser is a past or current director of the Association for Corporate Growth, Innovation Works (an affiliate of Ben Franklin Technology Partners), past President of the Pittsburgh Venture Capital Association, past President/Founder of the 3 Rivers Venture Fair, past President of the Pittsburgh Chapter of Financial Executives International, the Regional Development Funding Corporation and St. Clair Hospital. He holds a B.S. from John Carroll University and an MBA from the University of Pittsburgh. Mr. Glusser is also a CPA.