



Ben Franklin
Technology PArtners
Southeastern Pennsylvania

Getting More Bang for America's R&D Buck ITIF/Brookings—January 2017



Strategies for Success



- Expand commercialization efforts at research institutions.
- Catalyze industry-university research partnerships.
- Expand regional program for technology commercialization and entrepreneurial support.
- Encourage technology adoption by assisting small and mid- sized companies in implementing these new technologies.
- Support regional industry clusters through new opportunities for federal grants.
- Build a sustainable community of innovation and economic growth.

Strategies for Success requires:



Policy Changes

Structural Changes

Cultural Changes

Strategies for Success requires:



Policy Changes: Enacted

- **NIH/FDA: 21st Century Cures Act** — new funding and policies for Patient-focused Drug Development/Novel Clinical Trial design/Fast-track medical devices.
- **NSF: America Competes Act** — expands eligible applicant rules and expands collaboration incentives.

Strategies for Success requires:



Policy Changes: Still to be done

- **NSF:** New rules implemented by Program Directors; Changes to Phase IIB match restrictions for f/on funding to reflect market forces; Create “Phase Zero” concept
- **SBA:** SBIR — Increase \$ for commercialization support/flexibility on choice of vendor; SSBCI rules on conflicts of interest
- **EDA:** Match requirement restrictions; Increase \$ to RICs; Beef up technical and business expertise

Strategies for Success requires:



Structural Changes

- **Shift of University TTOs from Provost to Admin**
- **Management of I/U partnerships**
 - Who leads? ERCs and I/UCRC all University led, but would argue for independent leadership (Industry or TBED).
- **Leveraging best practices/regional models**
 - Identify and promote
- **Regional infrastructure**
 - Line-of-site for access to larger companies
 - Access to capital and business expertise

Strategies for Success requires:



Cultural Changes

- Recognition that failure is the norm, but “Fail Fast” is not always the best option
- Defeating the culture of impatience
- Shifting balance between basic research and commercialization—the role of the Fed and Research Institutions
- Tech Transfer Offices are NOT profit centers
- Investment/Co-Investment through independent Partnerships
- Impact Investing

2009-2014 AUTM Results



Institution	Research Expenditures	Licensing Revenue	% Return
University of Pennsylvania	\$ 5,188,900,338	\$ 159,544,782	3.1%
Drexel University	\$ 671,868,603	\$ 1,642,345	0.2%
Temple University	\$ 732,276,792	\$ 16,263,773	2.2%
Lehigh University	\$ 262,315,840	\$ 953,690	0.4%
CHOP	\$ 883,510,067	\$ 1,971,401	0.2%
Wistar	\$ 348,502,000	\$ 101,284,000	29.1%
Jefferson	\$ 462,163,864	\$ 9,469,856	2.0%
Fox Chase	\$ 164,308,137	\$ 2,695,841	1.6%
PSU	\$ 4,818,734,000	\$ 3,333,392	0.3%
CMU	\$ 1,772,953,951	\$ 50,735,170	2.9%
Pitt	\$ 4,429,560,000	\$ 56,206,745	1.3%
Rutgers	\$ 2,764,338,404	\$ 53,518,617	1.9%
Princeton	\$ 784,213,739	\$ 522,272,000	66.6%
Einstein	\$ 1,002,982,031	\$ 30,187,282	3.0%
Columbia	\$ 4,498,053,617	\$ 1,006,988,498	22.4%
NJIT	\$ 601,942,772	\$ 2,556,393	0.4%
NYU	\$ 2,557,081,600	\$ 1,265,168,902	49.5%
Mt. Sinai	\$ 2,139,063,380	\$ 230,010,527	10.8%
Totals	\$ 37,584,416,203	\$ 3,704,289,897	9.9%
Less the outliers	\$ 29,396,565,247	\$ 808,576,497	2.8%
National Average	\$ 365.6B	\$ 15.3B	4.2%

Rotavax
Wyeth

Alimta/Lilly

rDNA
Method

Remicade
J&J

Challenges to Research Institutions:



Barriers to the successful the transfer of intellectual property to the market are well recognized and include:

- Lack of commercialization expertise
- Insufficient or inconsistent recognition and support at universities for research with commercial aims
- Lack of access to funds and resources supporting translational, pre-commercialization activities

Challenges to Research Institutions

External:



Barriers to the successful the transfer of intellectual property to the market are well recognized and include:

- **Lack of access to enough seed-stage and early-stage venture capital**, including insufficient funding to support applied research aimed at enhancing the commercial potential of IP;
- **Lack of management talent**, workforce talent and industry-specific talent to create local companies;
- **Lack of a systematic innovation partnership** between university and industry;
- **Lack of a “critical mass” of supportive individuals** and business in these tech areas.

Recommendations:



How does an institute encourage culture change that supports entrepreneurship and translational research as fundamental to academic mission?

Change Tech Transfer culture

- Better communication between faculty and TT
- Better working relationship with outside stakeholders
- Policies that provide real incentives to faculty/students
- Policies that match real-world expectations
- License vs. Spin-out
- Increase incentives for entrepreneurial faculty/students--No penalty for entrepreneurial activities as it relates to promotion and tenure.
- Encourage cross-department/cross-School collaboration
- Increase resources for technology commercialization—prototyping, marketing, validation, investment
- Increase resources for training entrepreneurial faculty/students
 - I-Corp and other University-specific analogues

Regional Models

A faint, light purple line-art graphic of a stylized face with a beard and glasses, positioned on the right side of the slide. The face is composed of simple, rounded shapes and lines, giving it a modern, minimalist appearance. It is partially obscured by the text on the left.

University Commercialization Partnerships



- **Nation's first multi-institutional, university/industry regional partnership to accelerate commercialization of emerging technologies**
- **Ben Franklin, the University of Pennsylvania, & Drexel University founders; Funding via PA DCED**
- **Includes groundbreaking common IP, NDA and SRA agreements and novel revenue return formula.**
- **13 Member Institutions**
 - University of Pennsylvania
 - Drexel University
 - Children's Hospital of Philadelphia
 - Fox Chase Cancer Center
 - Harrisburg Univ of Science & Tech
 - Lehigh University
 - Millersville State
 - Philadelphia University
 - Temple University
 - Thomas Jefferson University
 - University of the Sciences
 - Villanova University
 - Widener University

2003 – 2014

\$23.5M PA funding	72 Licenses
> \$300M leveraged	49 company spinouts
>900 IP assets	300+ jobs created/retained

NTI Spin-Outs (Examples)

Optofluidics (NanoTweezers™ for Nanoparticle Analysis)

EpoXtal (Tunable RFID)

Eqalix (3D-Printed Wound Patches)

Nelum Sciences (Superhydrophobic Surfaces)

Vascular Magnetics (nano-enabled drug-eluting stents)



- **Licensed novel graphene manufacturing technology for electronics and sensors.**
- **Developing first roll-to-roll process for graphene**
- **Technology developed by Dr. Charlie Johnson at the University of Pennsylvania**
- **Received \$400K from NTI for critical proof-of-concept**
- **Received >\$1M in SBIR funding from the NSF and raised \$2.6M in 2014/2015.**
- **Expanded to Albany NanoTech Center in 2015**
- **23 jobs created and actively hiring**

University Investment Partnerships



Core elements include:

- Capital pools managed by Ben Franklin
- Partner funds co-invested, side-by-side with Ben Franklin
- Individually sized & targeted
- Integrated partner involvement to support key objectives



A \$1M startup accelerator designed to assist startup companies advancing Temple-created technologies.



A \$10M alumni-driven fund designed to assist startup companies advancing Drexel-created technologies.

Coulter Foundation Model



Endowment from Wallace Coulter Foundation to establish Centers for biomedical engineering. Drexel recipient of \$20M endowment.

Projects: Invest \$700K - \$1M/year

Selection criteria:

- Clinical context
 - Unmet clinical need
 - Cycle of care
- Stakeholder analysis
- Value Proposition/Technical Development
- Envisioned Product
- Competition
- Business Proposition
 - Market Size
 - Market Dynamics
 - Business Model
- Regulatory, Legal and IP

Process and Support:

Independent assessment board with Venture/Industry volunteers

Training via Close School with access to support network of experts;

Coulter Fellows (teams of MBA, MS/Ph.D. students)



A joint effort by PACT and Ben Franklin to bring the prestigious MIT-Venture Mentoring Service (MIT-VMS) program to the Philadelphia region.

Provides free support and guidance in a team environment to entrepreneurs to help them grow and advance their companies.

Volunteer mentors with NO financial interest or conflict-of-interest.

Started Pilot Program in June 2016 — as of December 2016:

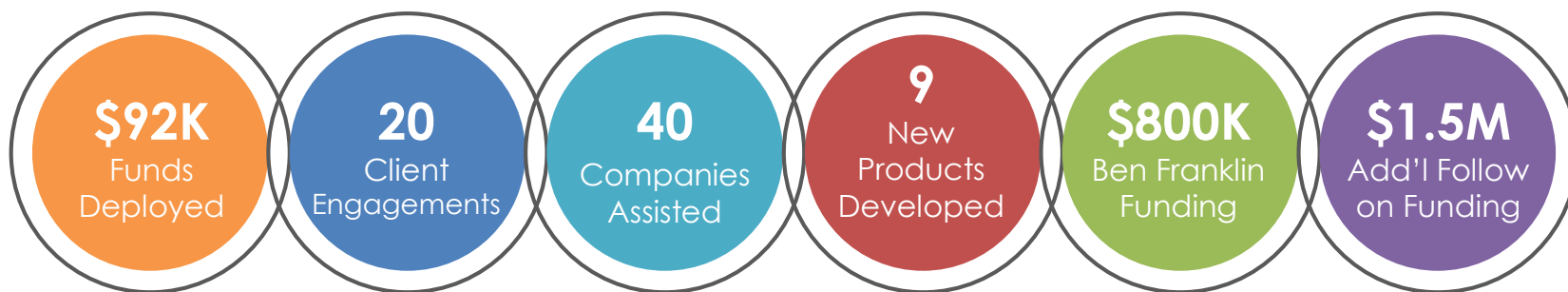
36 Mentors — all tech sectors/all skill sets

12 Mentor Teams — all stages of companies



Ben Franklin FabNet™

Structured as a *virtual accelerator*, **FabNet** provides a network of designers, prototypers, engineers, and small manufacturers offering companies a partnership for design, rapid prototyping, and fabrication; Matching funds; and access to specialized facilities.



QUALITY | INTEGRITY | INNOVATION

Greater Philadelphia MedTech Commercialization Network



Need		Need/dynamic	Partners
Access to Specialized Resources	Information	Bioinformatics	IMS Health Penn Bioinformatics CHOP Bioinformatics IntegriChain
		Market Research Healthcare Economics	IMS Health RedTeam Associates
	Physical & Operational	Access to prototyping and fabrication.	FabNet FabNet—IT FabNet--Pharm
	Validation and Integration	Biomarkers; proteomics/genomics	Wistar/Drexel/Penn consortium; BluePen Biomarkers
		Resources to test new technology CLIA Validation Lab	Exponent Evogen
		Cyber/HIPAA	Drexel Cybersecurity Institute Temple Cyber Group
		Clinical Trial Network Biostatistics	Provonix
	Space	Places to develop and test new technologies	Plexus; ICE; MCTC; PA Biotech; SC, Pennovation, AmpTech

Health Care Innovation Collaborative

Description

- Regional open innovation model to address health care challenges, stimulate & attract innovation, & create a virtual test bed across major institutions.
- Created in 2015 utilizing NTI model
- Nine inaugural partners

Goal

- Accelerate commercialization & adoption of health care solutions to increase quality of care and reduce costs.

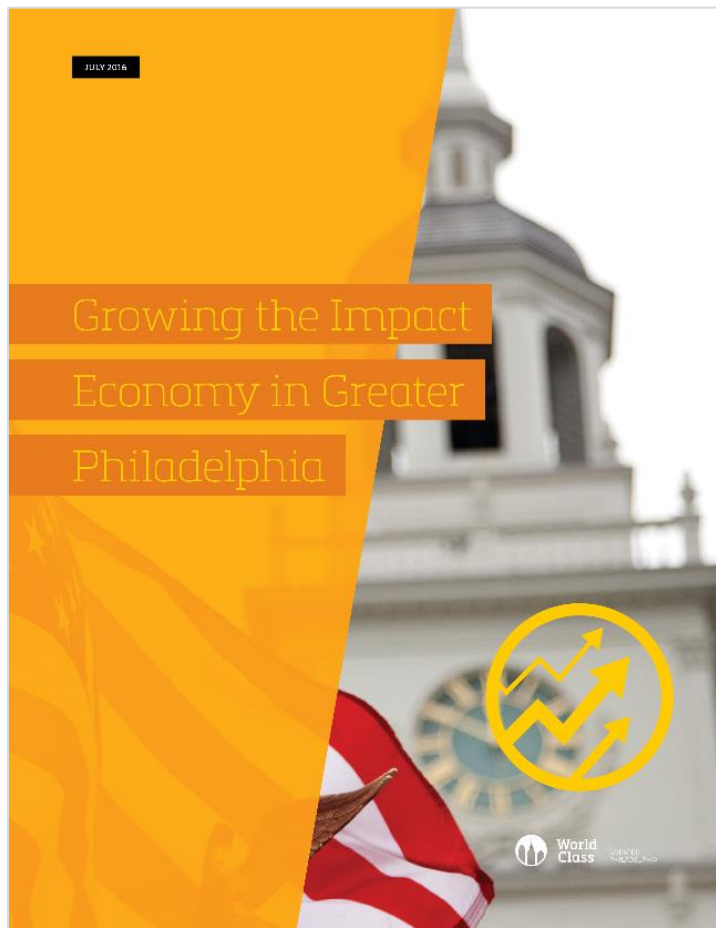
Highlights

- 18-month pilot successful with continued commitment of founding partners for additional 18-months;
 - We're still talking to each other!
- Dedicated staff within CEO Council for Growth;
- Integrated with restructured Ben Franklin process for health care investments.

Partners



Growing the Impact Economy in Greater Philadelphia



ImpactSMPHL

Goals and objectives:

- **Strengthen connections and collaborations**
- **Increase the number of startups who become successful**
- **Increase the number of regional investors**
- **Increase participation of established enterprises in impact objectives**
- **Position the region as a leading center of the impact economy**



“Science has cured every disease
known to mice.”

(Dave Weiner, Wistar Institute, formerly U. Penn)