

# Massachusetts' Competitive Position in Life Sciences: Where Do We Stand?

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This presentation is composed of excerpts from reports and presentations created by the Boston Consulting Group, Professor Alan Clayton-Matthews, the Howell Group of Boston, the Massachusetts Biotechnology Council, MassMedic, the Massachusetts Medical Device Industry Council, the Massachusetts Technology Collaborative, the Milken Institute, the Monitor Company Group, Professor Michael E. Porter and the New England Healthcare Institute. See Sources.

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# Situation Facing Massachusetts

- Massachusetts is one of the **world's leading centers** in Life Sciences, but the State is facing a crowded and increasingly competitive field
- The Life Sciences cluster encompasses a **wide range of products and services**, including medical devices, pharmaceutical products, research and testing, and health care delivery
- Massachusetts has a **rich set of institutions** in the field, but each tends to be narrowly focused on one aspect of the cluster



- There has been **no overarching strategy** for the cluster and **no structure** to develop one

# A Crowded Field

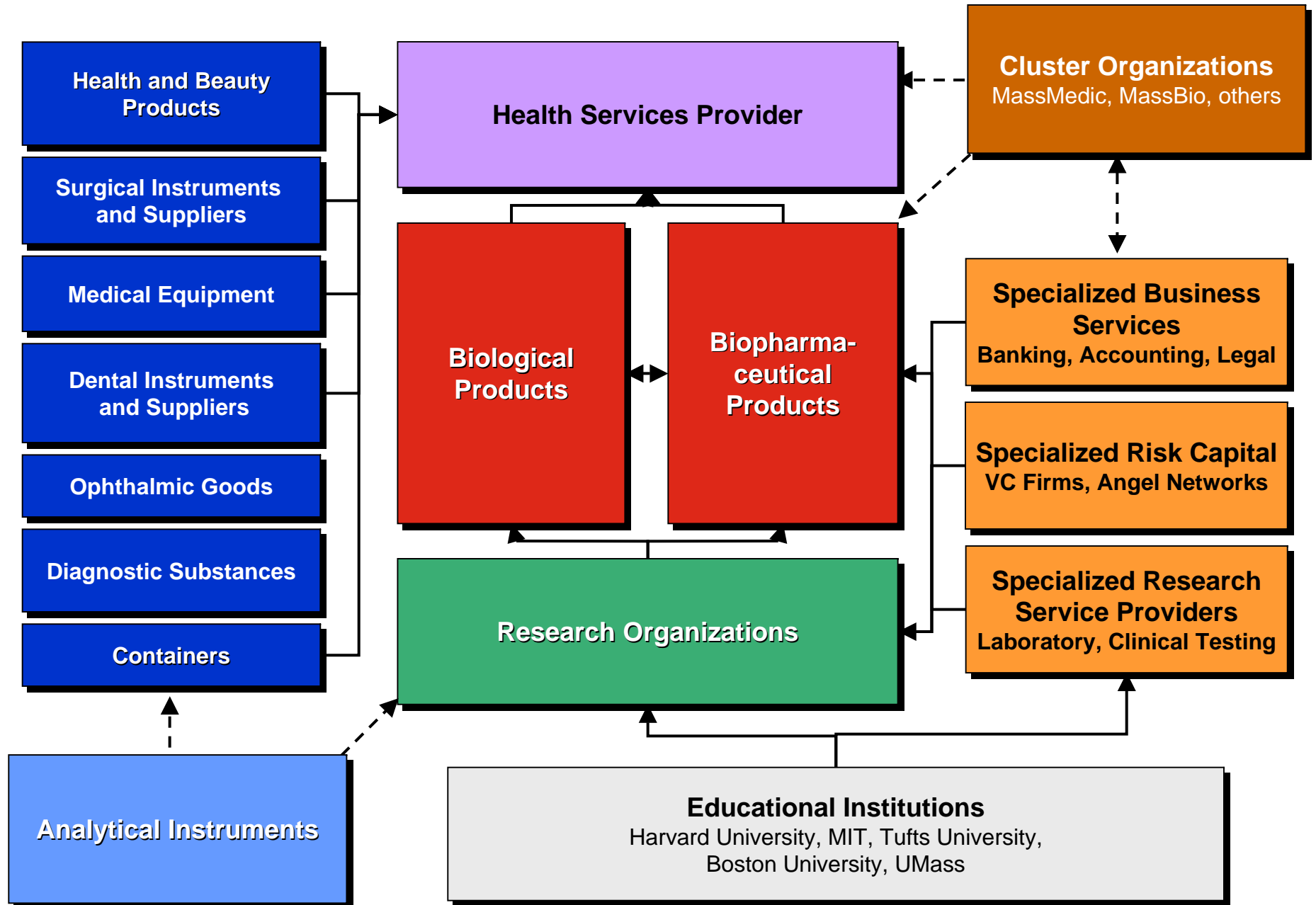
## U.S. States

- 41 states have launched Life Sciences **initiatives**
- 16 states have **appropriated funds** for new biotech activities
- 12 states have a dedicated **Biotech specialist** in government
- 10 states have explicit **biotechnology strategies**

## Countries

- Denmark/Sweden, ***Mediconvalley***
- Germany, ***BioRegio-Initiative***
- Netherlands, ***BioDelta***
- Saudi Arabia, ***Jeddah BioCity***
- Singapore, ***Biopolis of Asia***
- United Kingdom, ***Genome Valley***
- ... *and many other countries*

# Life Sciences Cluster



# Clusters and Competitiveness

## ● Clusters Increase Productivity / Efficiency

- Efficient **access** to specialized inputs, services, employees, information, institutions, and “public goods” (e.g. training programs)
- Ease of **coordination** and transactions across firms
- Rapid **diffusion** of best practices
- Ongoing, visible **performance comparisons** and strong incentives to improve vs. local rivals

## ● Clusters Stimulate and Enable Innovations

- Enhanced ability to **perceive innovation opportunities**
- Presence of multiple suppliers and institutions to assist in **knowledge creation**
- Ease of **experimentation** given locally available resources

## ● Clusters Facilitate Commercialization

- Opportunities for **new companies** and **new lines of established business** are more apparent
- **Commercializing** new products and starting new companies is easier because of available skills, suppliers, etc.



Clusters reflect the fundamental influence of **externalities / linkages** across firms and associated institutions in competition

# Institutions for Collaboration

## Selected Massachusetts Organizations

### Life Sciences Industry Associations

- Massachusetts Biotechnology Council
- Massachusetts Medical Device Industry Council
- Massachusetts Hospital Association

### General Industry Associations

- Associated Industries of Massachusetts
- Greater Boston Chamber of Commerce
- High Tech Council of Massachusetts

### Economic Development Initiatives

- Massachusetts Technology Collaborative
- Mass Biomedical Initiatives
- Mass Development
- Massachusetts Alliance for Economic Development

### University Initiatives

- Harvard Biomedical Community
- MIT Enterprise Forum
- Biotech Club at Harvard Medical School
- Technology Transfer offices

### Informal networks

- Company alumni
- VC community
- University alumni

### Joint Research Initiatives

- New England Healthcare Institute
- Whitehead Institute For Biomedical Research
- Center for Integration of Medicine and Innovative Technology (CIMIT)

# Shifting Responsibilities for Economic Development

## Old Model

- **Government** drives economic development through policy decisions and incentives



## New Model

- Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration

# The Massachusetts Life Sciences Cluster

## Performance

### Productivity

- Average **wages** in the Massachusetts Life Sciences Cluster **are amongst the highest in the country**, and growing strongly
- The Cluster has the **largest share of national life sciences employment** of any metropolitan region but growth is **only slightly above the national average** for life sciences

### Innovation

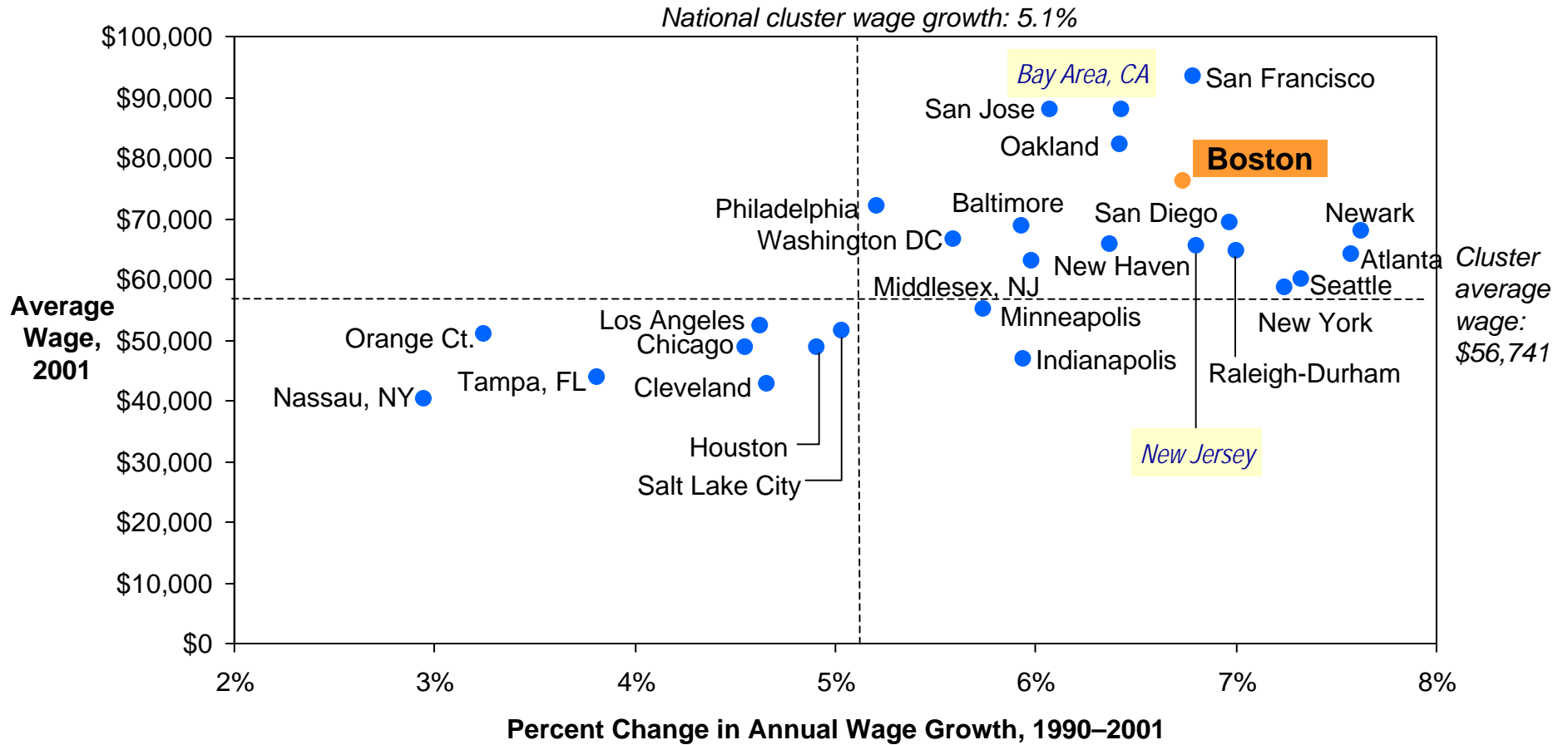
- The Massachusetts Life Sciences Cluster has generated many recently approved biotech products, and has about **7.5% of the world's pharmaceutical product pipeline**
- The Cluster is the leading metropolitan region in terms of **life sciences patents**, but growth in patents is **only slightly above average**

### Establishments

- The Massachusetts Life Sciences Cluster has **relatively few large local firms. Establishment growth** is only slightly above average



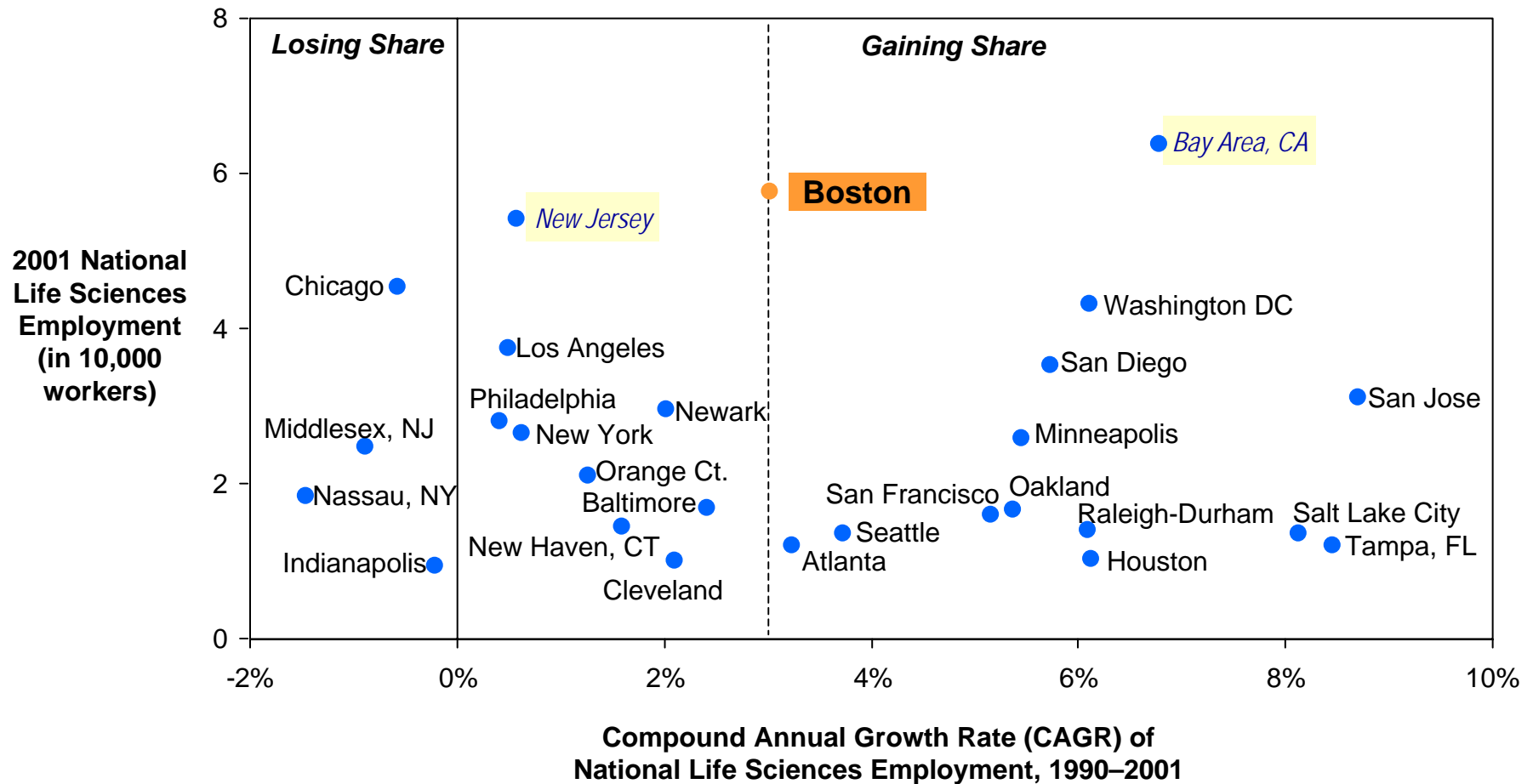
# Wages in Leading Life Science Clusters



Note: S. F. Bay Area — Average wage of San Francisco, San Jose, Oakland

Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

# Employment in Leading Life Science Clusters

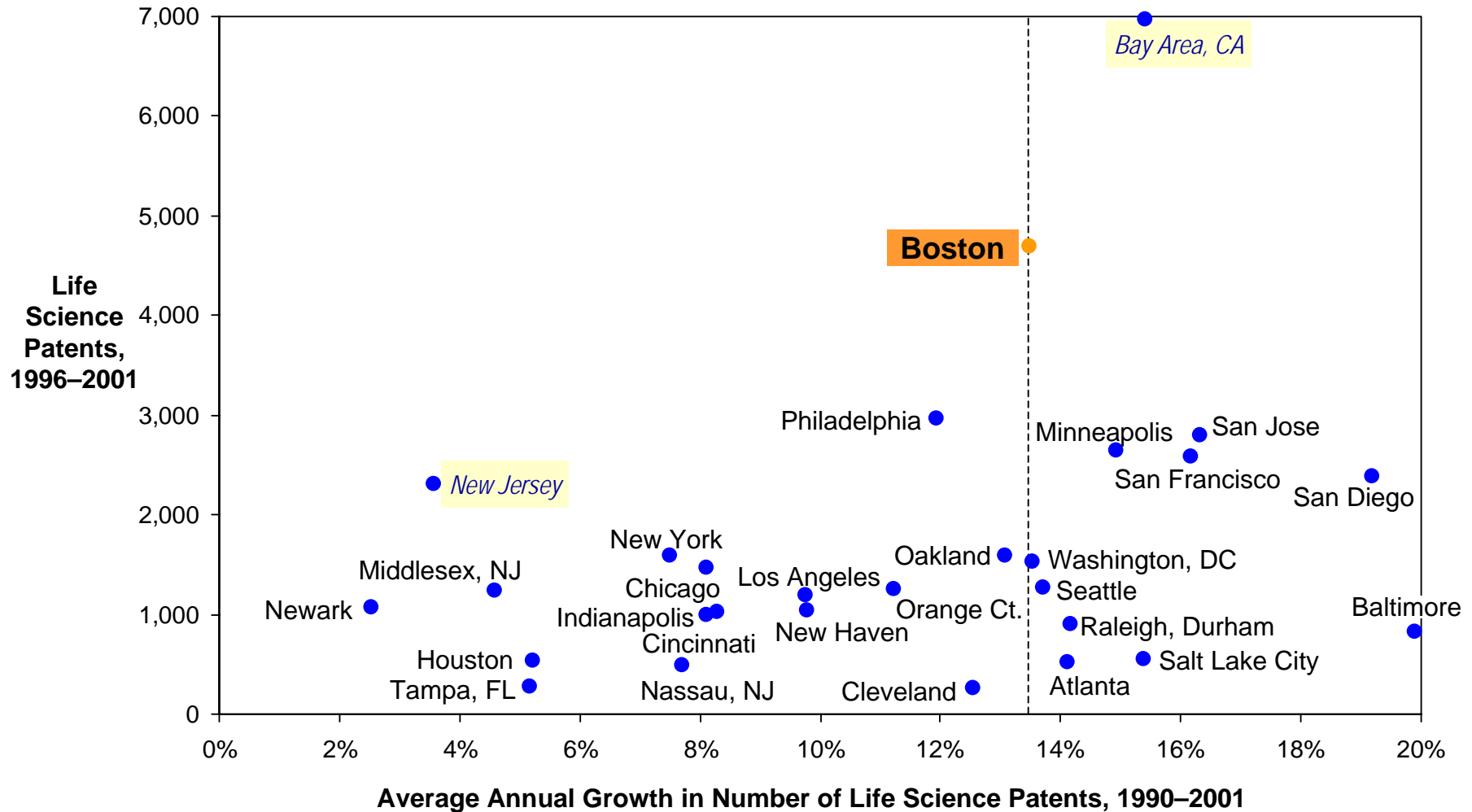


Note: S. F. Bay Area — San Francisco, San Jose, Oakland, New Jersey – Newark, Middlesex

Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

# Innovation Output in Leading Life Science Clusters

## Patents and Patent Growth, 1990–2001

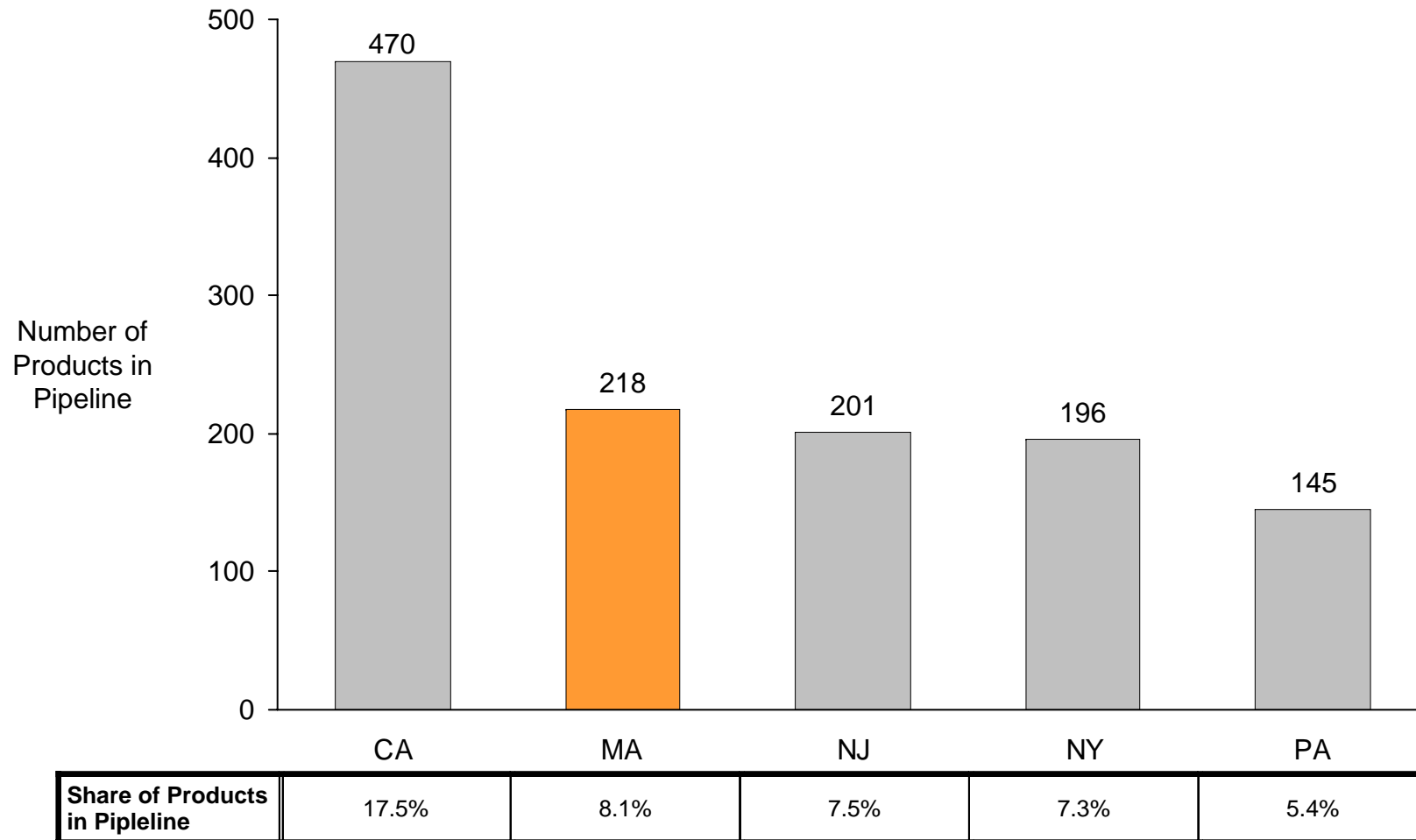


Note: S. F. Bay Area — San Francisco, San Jose, Oakland, New Jersey – Newark, Middlesex

Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

# Innovation Performance in Leading Life Sciences Clusters

## Share of Global Clinical Development Pipeline by U.S. State



Note: Pipeline includes large- and small- molecule drugs, diagnostic tests, and biodevices.

State attribution based on headquarters location of product's primary owner

Source: Biospace Clinical Competitive Intelligence Systems (CCIS) database, September 2002

from Massachusetts Biotechnology Council, BCG- MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy

# Massachusetts' Competitive Position in Life Sciences

- Relative Performance

- **Competitive Assessment**

- Strategic Issues

# Assessing Life Sciences Competitiveness

## Sources of Data

- Findings from recent studies of the cluster:
  - *The Economic Contributions of Health Care to New England*, New England Healthcare Institute, Milken Institute, 2003
  - *Massachusetts Life Sciences Data*, Massachusetts Technology Collaborative, 2003
  - *MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy*, Massachusetts Biotechnology Council, Boston Consulting Group, 2003
  - *The Medical Device Industry in Massachusetts*, Alan Clayton-Matthews, MassMedic, Massachusetts Medical Device Industry Council, 2001
- Survey of 250 Massachusetts' companies, 50+ from the Life Sciences
  - Conducted by Monitor Company
- 125+ in-depth interviews with cluster leaders
  - Conducted by Monitor Group and the Boston Consulting Group
- Analysis of regional and cluster data from the Institute for Strategy and Competitiveness at Harvard

# Massachusetts Life Science Cluster

## Summary Assessment

### Context for Firm Strategy and Rivalry

### Factor (Input) Conditions

#### Strengths

- Strong **K-12 educational system**
- Strong **science base** of leading researchers and leading academic research centers
- Frequent **technology and knowledge transfer** from research to industry
- High availability of **risk capital** and **federal research funding**

#### Weaknesses

- High **cost of doing business**
- High **cost of living**, especially housing
- Weaknesses in **physical infrastructure**, notably Logan airport
- Developing **shortages of mid-level professionals**
- **Technology transfer** lagging other important regions

#### Strengths

- Strong base of local companies that **compete on innovation** using cutting edge science
- Local companies **compete and cooperate intensively**

#### Weaknesses

- Limited **manufacturing** in the State, especially in pharmaceuticals
- Few **headquarters of large, international companies**

### Related and Supporting Industries

#### Strengths

- Presence of **specialized service providers** such as law firms and consultants
- **Frequent interaction** with local suppliers
- Presence of instrument companies and other equipment **suppliers**

### Demand Conditions

#### Strengths

- Sophisticated **local medical practitioners**

#### Weaknesses

- Reimbursement environment does not foster the **adoption of product and process innovations** in health care delivery
- High medical **malpractice costs** in Massachusetts may deter new treatments
- Barriers to performing **clinical trials** with local institutions

# Massachusetts Life Science Cluster

## Summary Assessment - Continued

### Role of Government

#### Strengths

- Increasing **recognition** of the potential of Life Sciences for the Commonwealth

#### Weaknesses

- Lack of consistent, predictable process for **site regulation**, especially at the local level
- Lack of **overall responsiveness** and a **coordinated approach** to support the cluster by state government
- **R&D tax credits** are not well structured to benefit research companies

### Institutions for Collaboration

#### Strengths

- Strong array of industry councils, tech transfer offices, enterprise networks, and other **institutions for collaboration**
- Very **high frequency of interaction** among cluster members relative to other locations (producers, suppliers, customers, universities, etc.)

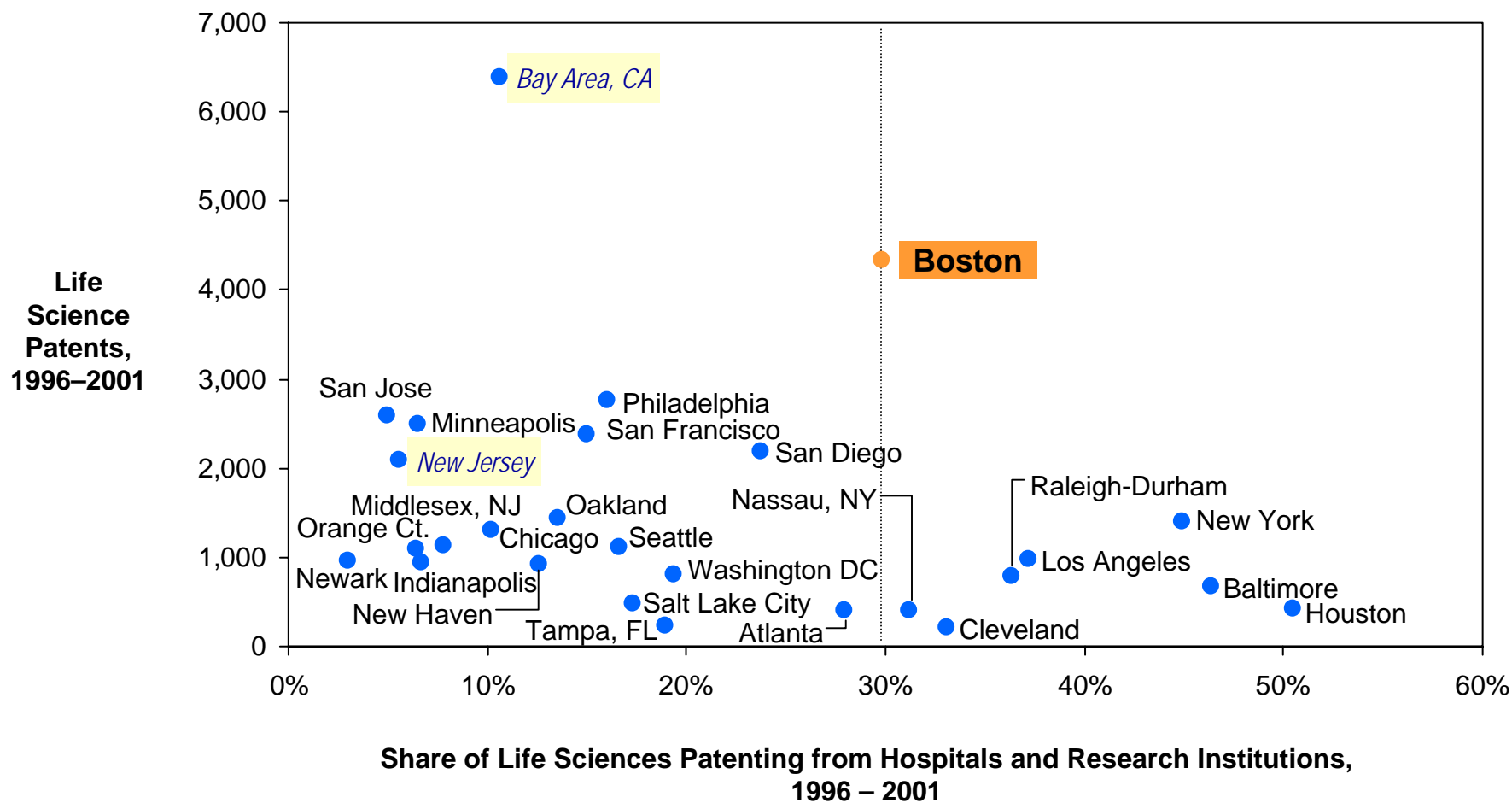
#### Weaknesses

- Lack of institutions facilitating networking **across** segments



# Role of Universities and Research Institutions

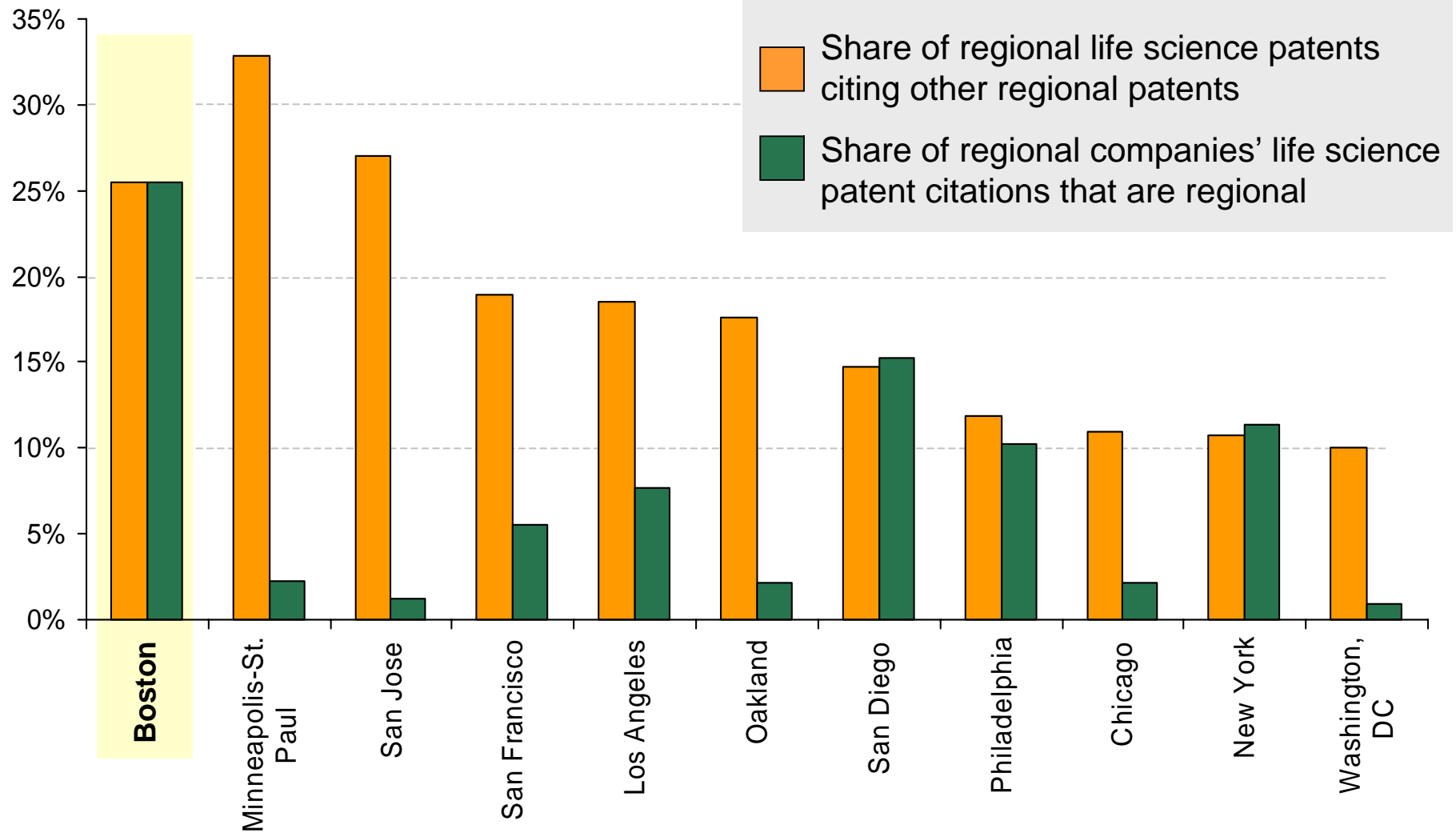
## Leading Life Sciences Clusters



Note: S. F. Bay Area — San Francisco, San Jose, Oakland, New Jersey – Newark, Middlesex  
 Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

# Regional Knowledge Spill-Overs

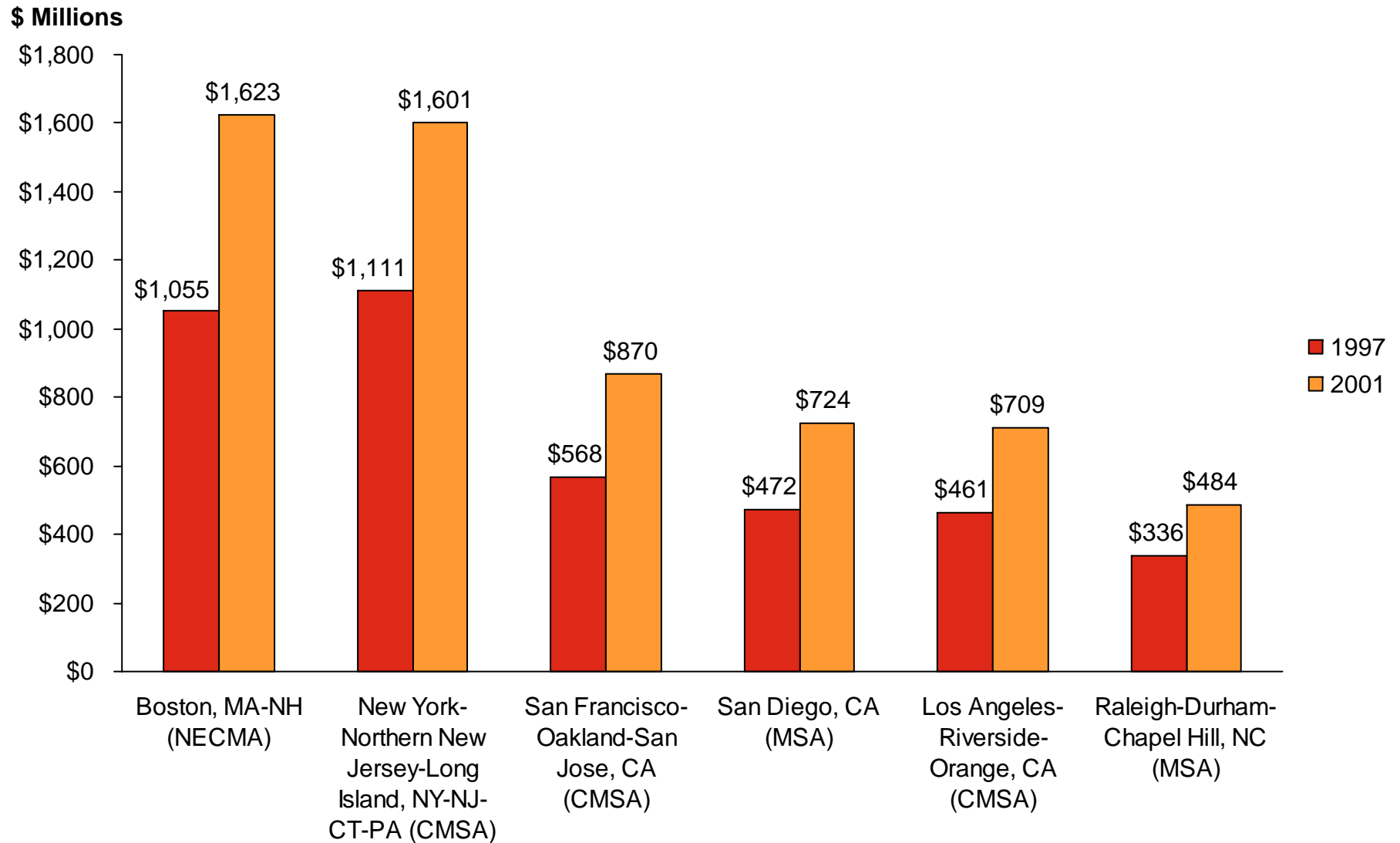
## Total Life Sciences Patent Citations by Region, 1990s



Note: Data corresponds to non-individual patents issued between 1994-1998 and citing patents issued between 1990 and 1998; Self-citations are excluded; only life sciences patents citing life sciences patents are considered.

Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

# Availability of NIH Funding for Life Sciences



Source: National Institute of Health, Office of Extramural Research from Massachusetts Technology Collaborative - Massachusetts Life Sciences Data

# Massachusetts Life Sciences Cluster

## Competition and Collaboration

### Survey and Interviews Highlights

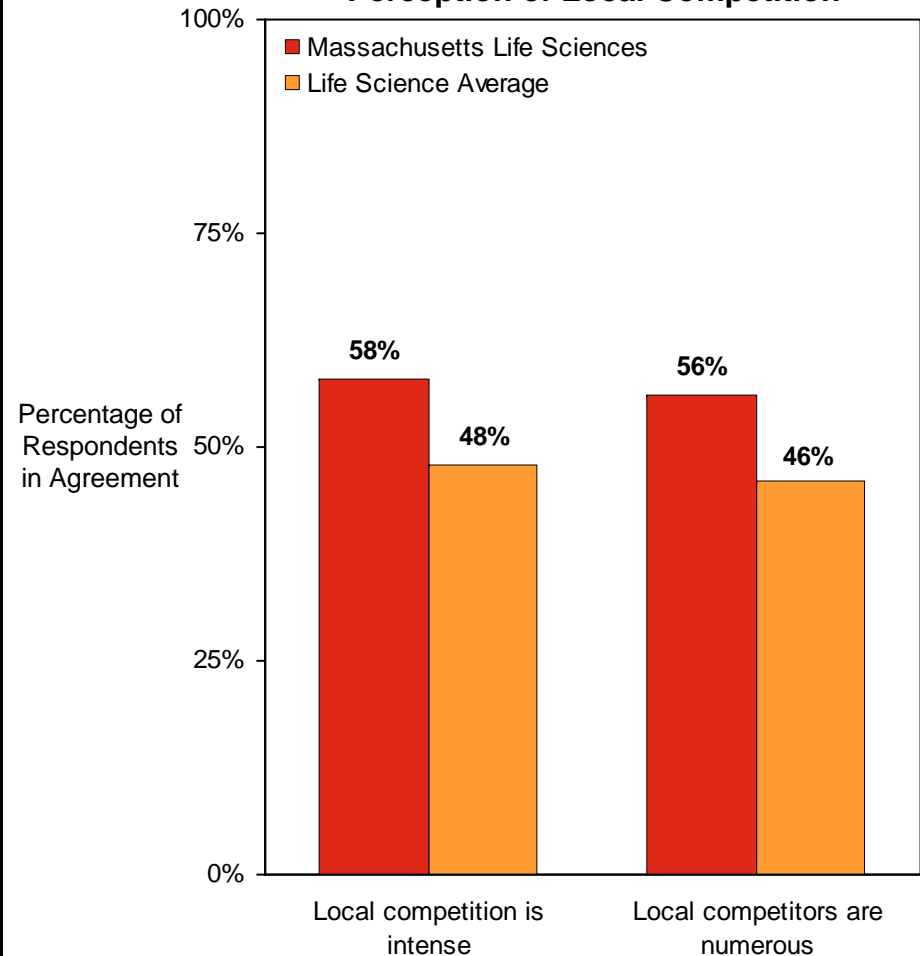
#### Local Competition

- Massachusetts Life Sciences Cluster has a relatively **intense level of local competition** with high numbers of competitors based in the area
  - *“Life science businesses in the area compete primarily for skilled labor, and competition here can get intense.”*
    - Senior Executive, Hospital Organization

#### Competition and Cooperation

- Despite intense competition, companies work together on common concerns
  - *“We come together to lobby for regulatory reform and legislation that can benefit the industry. It’s one of the perks of a high industry concentration.”*
    - Senior Executive, Medical Device Company

Massachusetts vs. Regional Average:  
Perception of Local Competition



Note: Life Sciences average reflects data from the life sciences clusters of San Diego, Pittsburgh, and the Research Triangle  
Source: Professor Michael E. Porter, Monitor Company survey and interviews

# Massachusetts Life Sciences Cluster

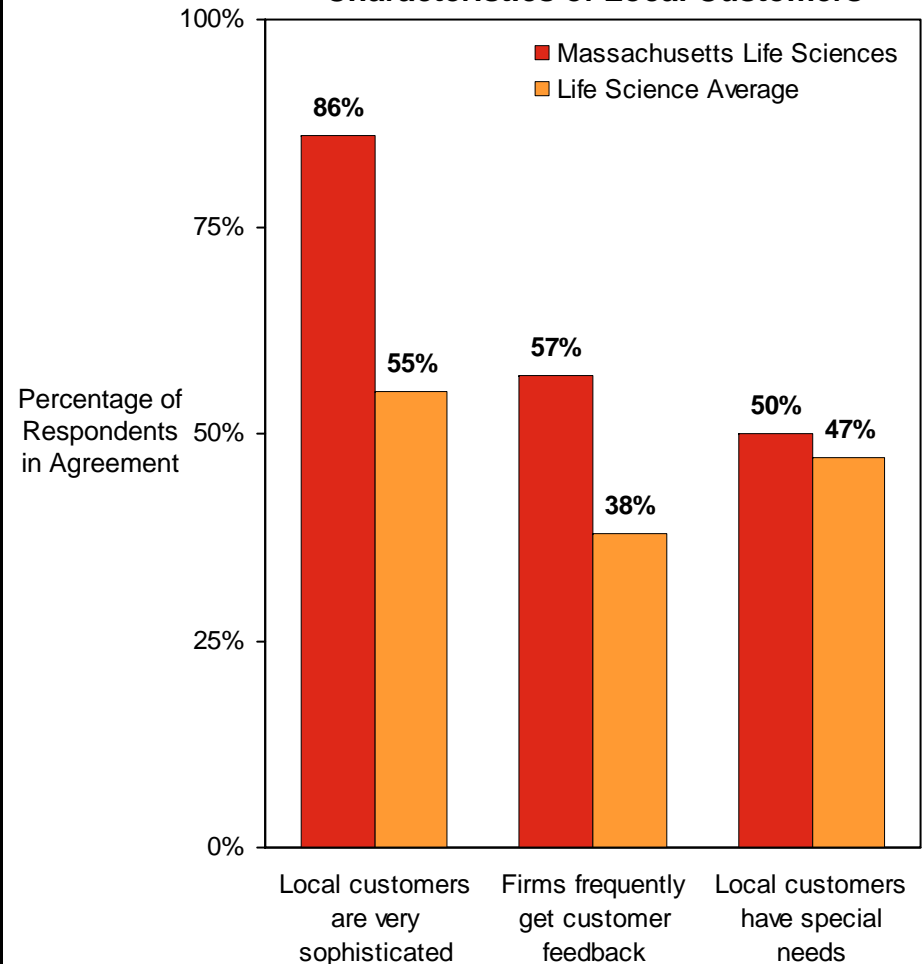
## Local Demand

### Survey and Interviews Highlights

#### Local Customers

- Local customers in the Massachusetts Life Sciences cluster are relatively **sophisticated, demanding, and offer frequent feedback** to firms
  - *“Customer needs are sophisticated because of the high concentration of medical treatment and academic centers. Patients’ expectations are very high, both in terms of access and quality.”*
    - Senior Executive, Hospital Organization
  - *“Our customers are primarily hospitals . . . It’s a real benefit to be located so close by. In addition, we can get immediate feedback from doctors about how a product is working.”*
    - Senior Executive, Medical Device Company

Massachusetts vs. Regional Average: Characteristics of Local Customers



Note: Life Sciences average reflects data from the life sciences clusters of San Diego, Pittsburgh, and the Research Triangle  
 Source: Professor Michael E. Porter, Monitor Company survey and interviews

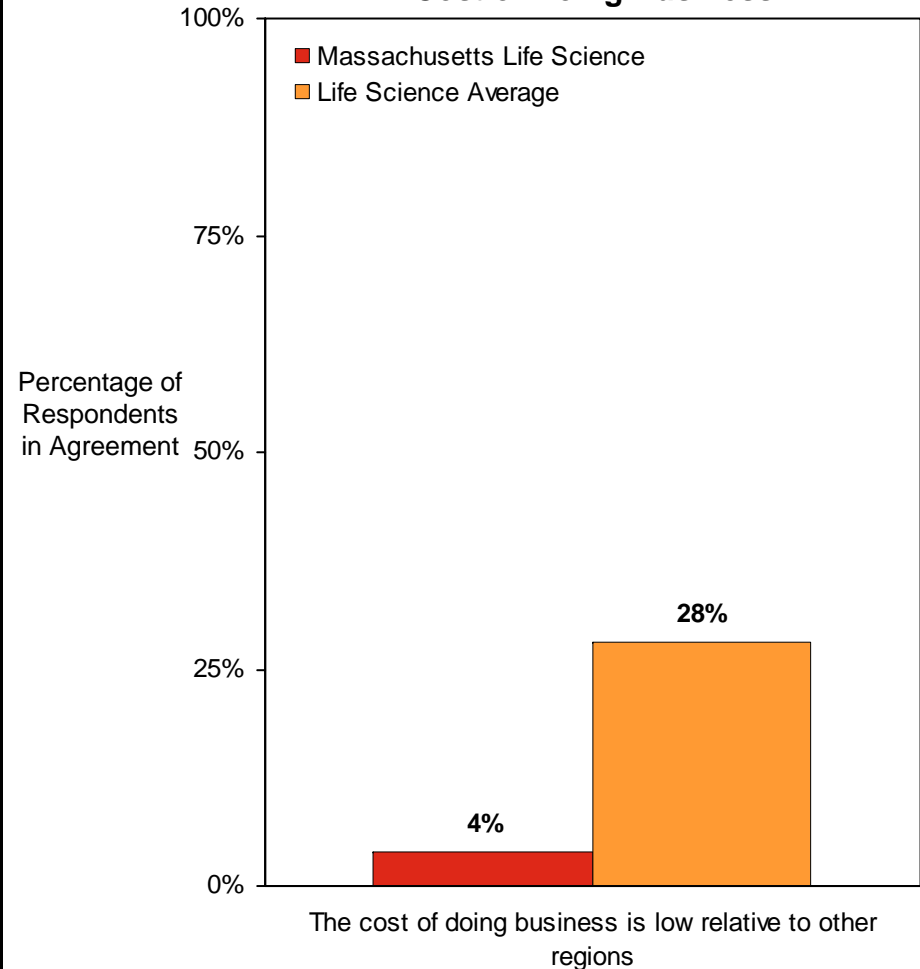
# Massachusetts Life Sciences Cluster

## High Cost Location

### Survey and Interviews Highlights

- **The cost of doing business in Massachusetts is high** relative to other regions and may represent a barrier for further expansion in the region
  - *“Labor costs and price for space are much higher here.”*
    - Senior Executive, Medical Device Company
  - *“Space and the cost of space are significant barriers to future expansion in the region.”*
    - Senior Executive, Biotechnology Company

Massachusetts vs. Regional Average:  
Cost of Doing Business



Note: Life Sciences average reflects data from the life sciences clusters of San Diego, Pittsburgh, and the Research Triangle  
Source: Professor Michael E. Porter, Monitor Company survey and interviews

# Massachusetts Life Sciences Cluster

## Physical Infrastructure

### Survey and Interviews Highlights

#### Physical infrastructure

- The quality of the **transportation and communications infrastructure** are seen as **lacking** relative to other life science clusters

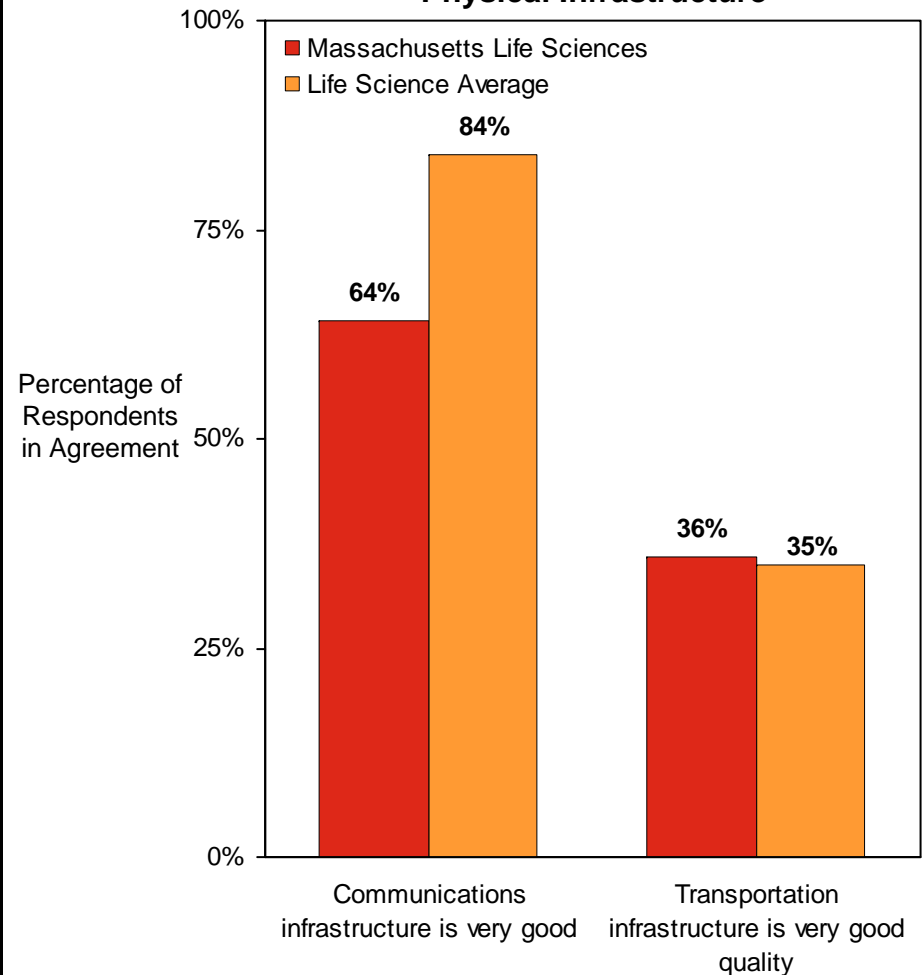
– *“The transportation infrastructure is a significant barrier to future expansion for companies in the area.”*

– Senior Executive, Industry Organization

– *“Something needs to be done about the Logan Airport. It’s becoming a bigger problem for our employees, most of whom travel a great deal.”*

– Senior Executive, Medical Device Company

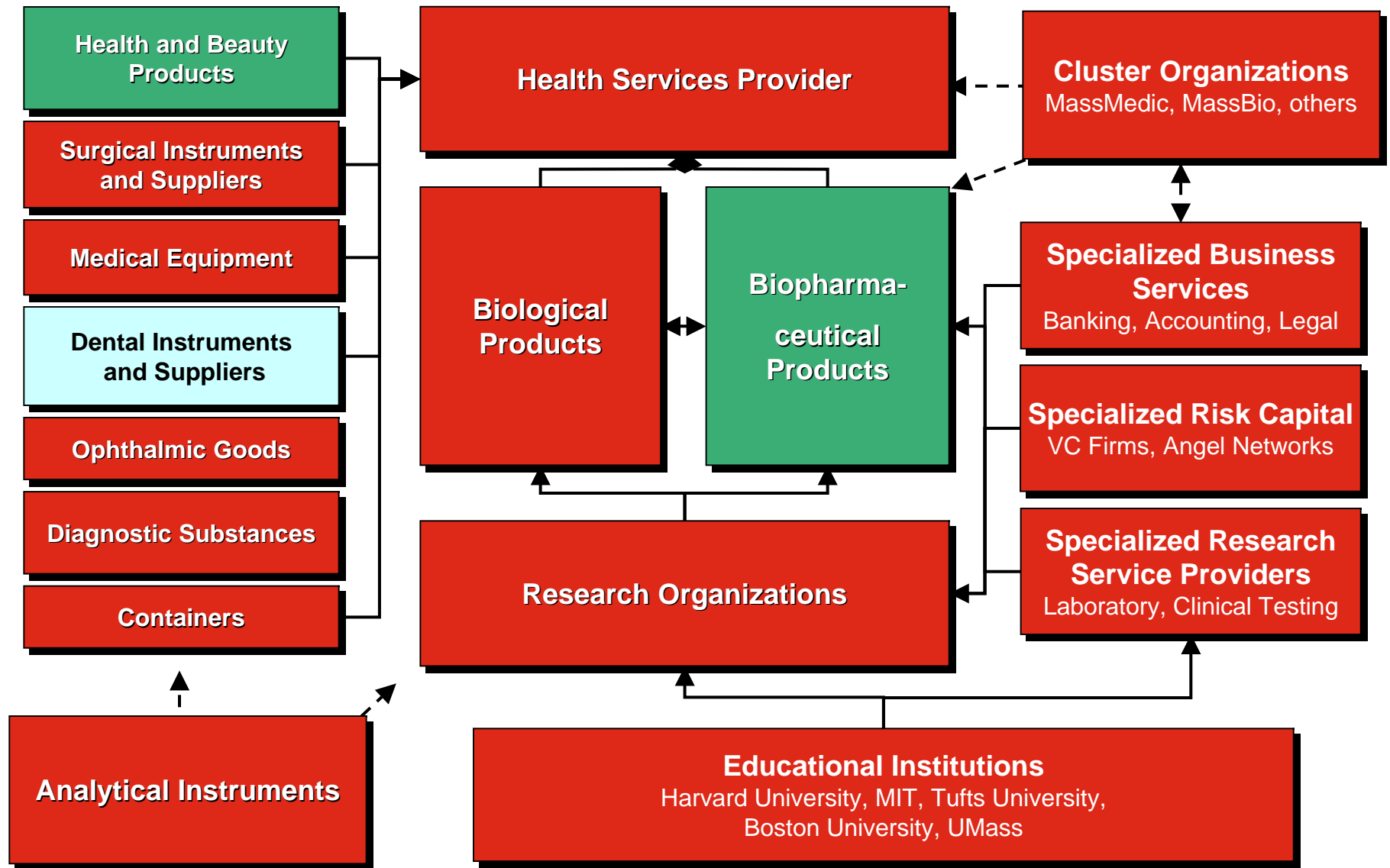
Massachusetts vs. Regional Average:  
Physical Infrastructure



Note: Life Sciences average reflects data from the life sciences clusters of San Diego, Pittsburgh, and the Research Triangle  
Source: Professor Michael E. Porter, Monitor Company survey and interviews

# Massachusetts Life Sciences Cluster

## Competitive Position by Sub-Cluster, 2001



■ Among National Leaders (1–5)    ■ Significant Presence (21–40)  
■ Established Position (6–20)     Less Developed (41+)

Note: Competitive position based on relative employment

Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

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2003 Life Sciences Summit



# Massachusetts Life Sciences Cluster

## Role of Government

### Survey and Interviews Highlights

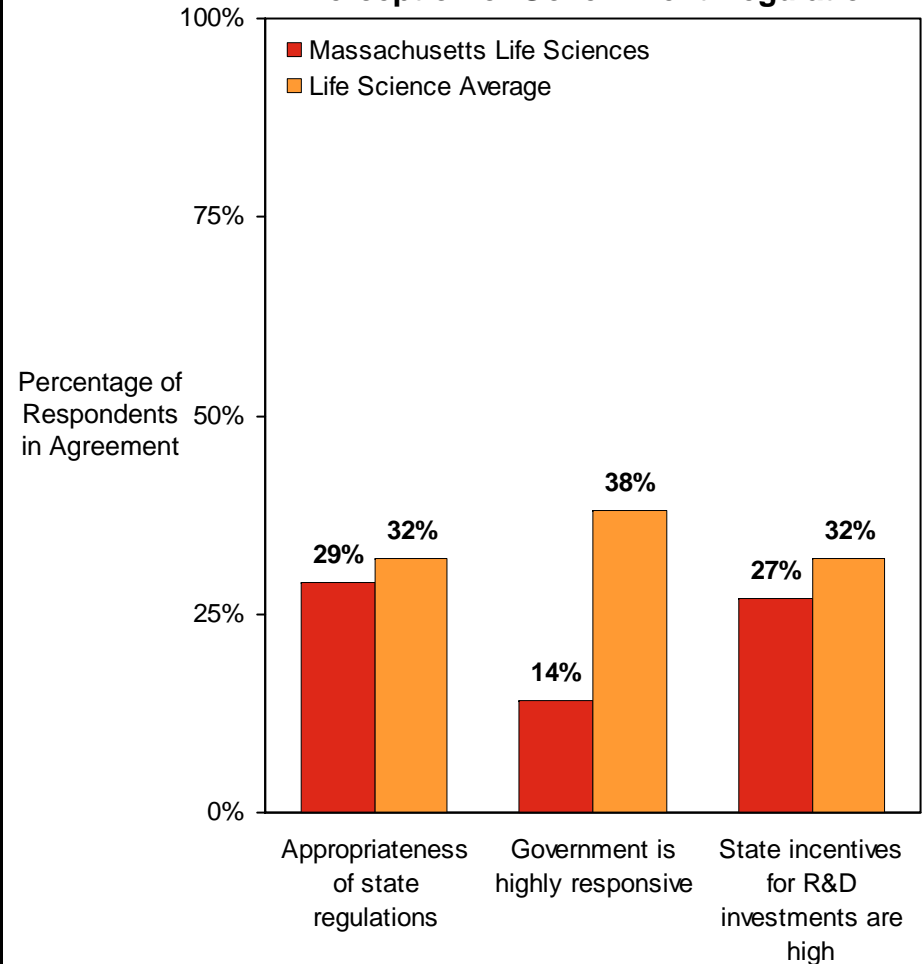
#### Government Regulation

- Massachusetts **ranks below other regional clusters** in perceived governmental support for Life Sciences
  - *“Local government regulations and compliance procedures can often be a problem; in contrast, there aren't as many issues at the state level.”*
  - Senior Executive, Pharma Company

#### Priorities for State Government

- Speed up the approval process to decrease time to market
- Improve the incentives and processes for innovation and investment in R&D initiatives
  - *“Introduce legislation that permits life sciences to innovate in a clear and predictable framework (e.g., permitting and ability to do research).”*
  - Senior Executive, Biotech Company

Massachusetts vs. Regional Average: Perception of Government Regulation



Note: Life Sciences average reflects data from the life sciences clusters of San Diego, Pittsburgh, and the Research Triangle

Source: Professor Michael E. Porter, Monitor Company survey and interviews

# Government Support for Life Sciences

## Leading States

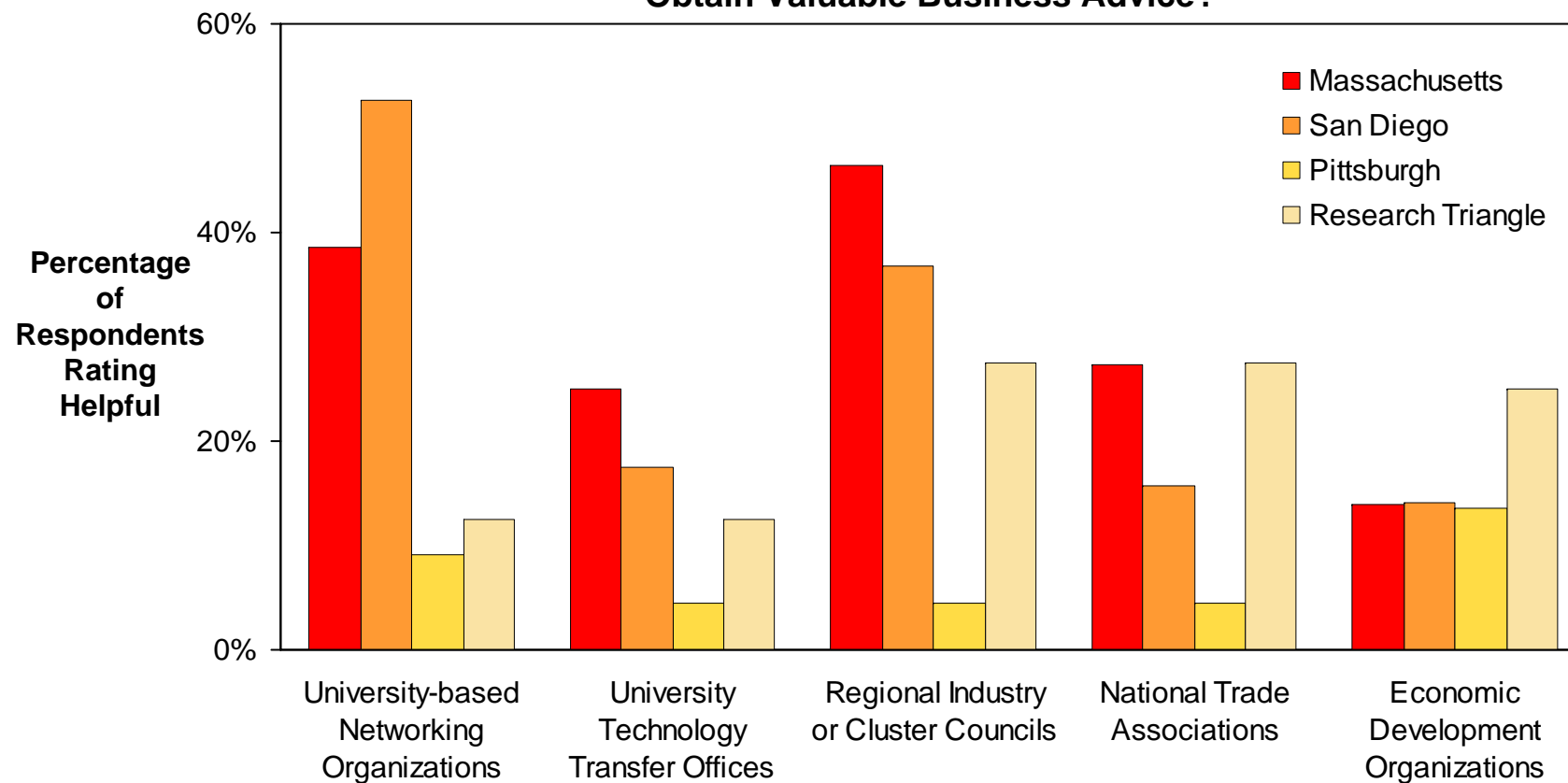
	Massachusetts	New Jersey	California	North Carolina
Tax Policy	<ul style="list-style-type: none"> <li>• 10% R&amp;D tax credit; can be carried forward for up to 3 years</li> <li>• 3% credit on depreciable assets</li> <li>• Single sales factor</li> </ul>	<ul style="list-style-type: none"> <li>• 10% High tech investment tax credit; transferable to other companies</li> <li>• Net operating-loss can be carried forward for 15 years</li> </ul>	<ul style="list-style-type: none"> <li>• 15%-24% R&amp;D tax credit</li> <li>• 100% net-operating-loss carry forward for 8 years</li> </ul>	<ul style="list-style-type: none"> <li>• 5% R&amp;D tax credit</li> <li>• 7% tax credit for machine and equipment leases</li> </ul>
Institutional Support	<ul style="list-style-type: none"> <li>• Massachusetts Biomedical Initiatives (MBI)</li> </ul>	<ul style="list-style-type: none"> <li>• Biotechnology Council of New Jersey</li> <li>• New Jersey Technology Council's Life Sciences Network</li> </ul>	<ul style="list-style-type: none"> <li>• Jointly-funded research programs of state universities and industry</li> </ul>	<ul style="list-style-type: none"> <li>• State-funded North Carolina Center for Biotechnology (NCBC)</li> </ul>
Financial Support	<ul style="list-style-type: none"> <li>• Cumulative MBI investment of \$8 million</li> <li>• Some state-pension-fund investment</li> </ul>	<ul style="list-style-type: none"> <li>• Early Stage Enterprises, \$40m</li> <li>• NJ Technology Council Venture Fund, \$30m</li> <li>• Seed Capital Program</li> </ul>	<ul style="list-style-type: none"> <li>• \$500 million CalPERS Biotechnology Program</li> </ul>	<ul style="list-style-type: none"> <li>• \$10 million North Carolina Bioscience Investment Fund</li> <li>• \$42 million-\$150 million in tobacco money for bio-manufacturing</li> </ul>

**Source:** Massachusetts Biotechnology Council, Boston Consulting Group - MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy; BIO, State Government Initiatives in Biotechnology, September 2001

# Institutions for Collaboration

## Helpfulness for Entrepreneurs

How Much Do the Following Local Institutions Help Entrepreneurs in Your Region Form Valuable Business Contacts or Obtain Valuable Business Advice?



Note: Life Sciences average reflects data from the life sciences clusters of San Diego, Pittsburgh, and the Research Triangle  
 Source: Professor Michael E. Porter, Monitor Company survey

# Massachusetts' Competitive Position in Life Sciences

- Relative Performance
- Competitive Assessment
- **Strategic Issues**

# Competitive Agenda

## Massachusetts State Government

- Address weaknesses in the **physical infrastructure**, especially in transportation
- Increase the **supply of housing** to lower the cost of living in the State
- Work with local governments to identify, develop, and permit promising **sites for life sciences companies** (e.g., single site locator)
- Improve the structure of **R&D incentives** for life sciences companies
- Create a **clear point of contact** for existing companies in the Life Sciences cluster as well as potential out-of-state investors
- Participate actively in the Life Sciences **cluster development** process
- Increase the overall **responsiveness** of state government to business needs

# Competitive Agenda

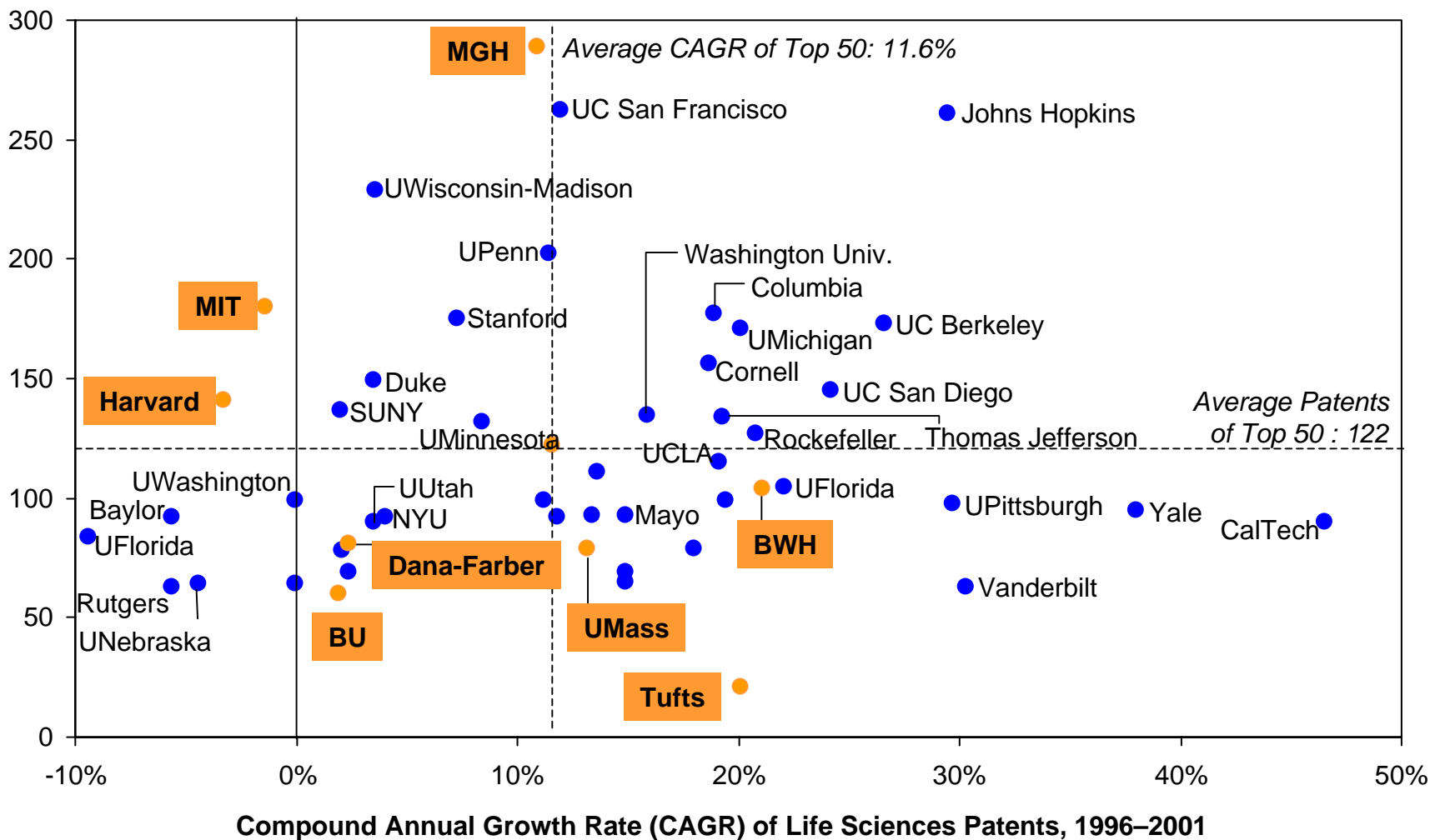
## Massachusetts Life Sciences Cluster

- Improve **technology transfer**
- Make Massachusetts' **health care delivery** the most advanced and innovative in the nation
  - Create an environment and rules that facilitate the introduction of new treatments
  - Adopt new service delivery technologies (e.g., IT)
- Secure the State's **medium skilled workforce** position
- Expand **clinical trials** in the State
- Capture more downstream **manufacturing**

# Life Sciences Patents

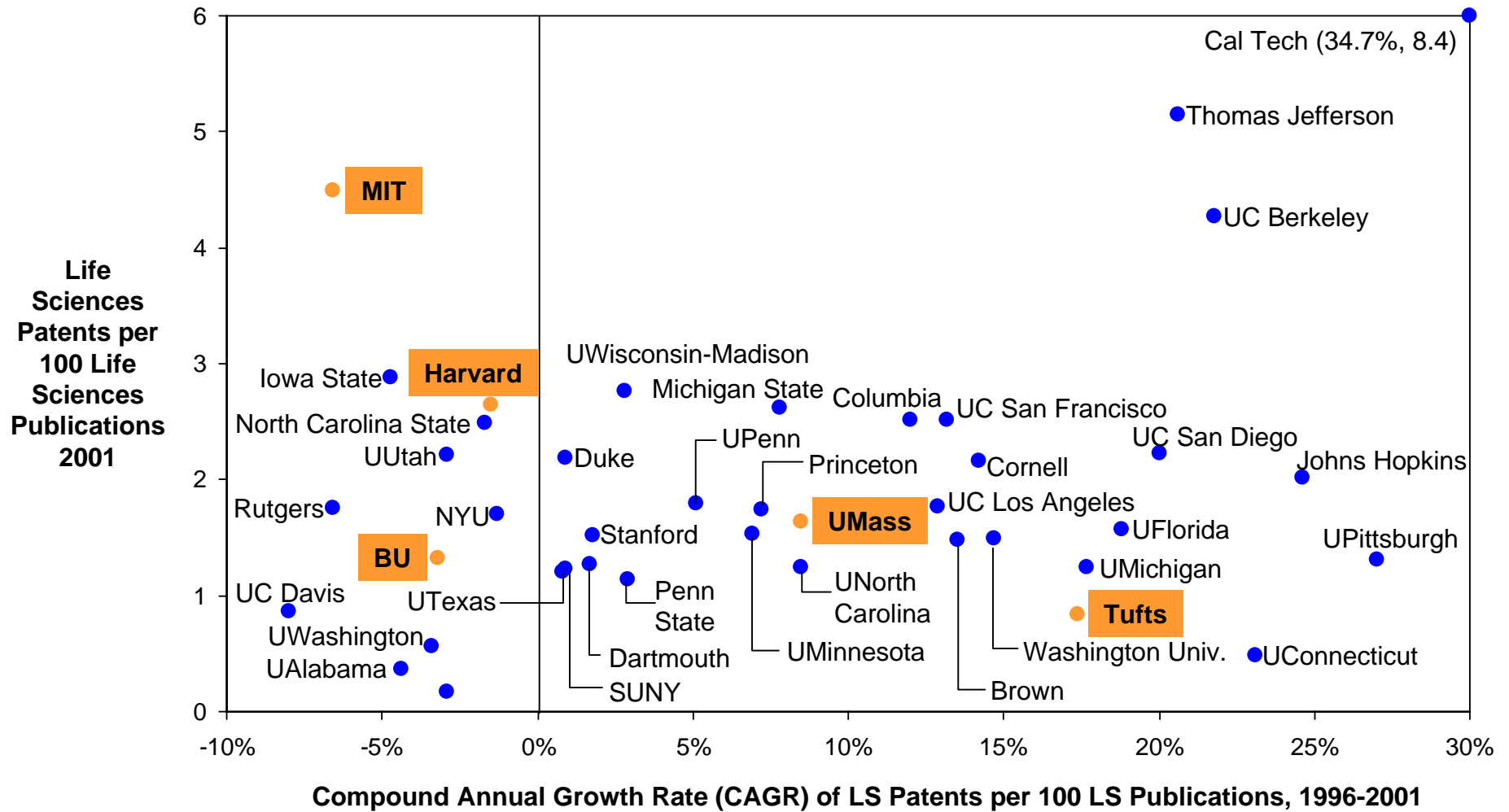
## Top Patenting Universities and Affiliated Hospitals

Life Sciences  
Patents, 1996–2001



Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

# Life Sciences Research Patents per Publication, 1996-2001

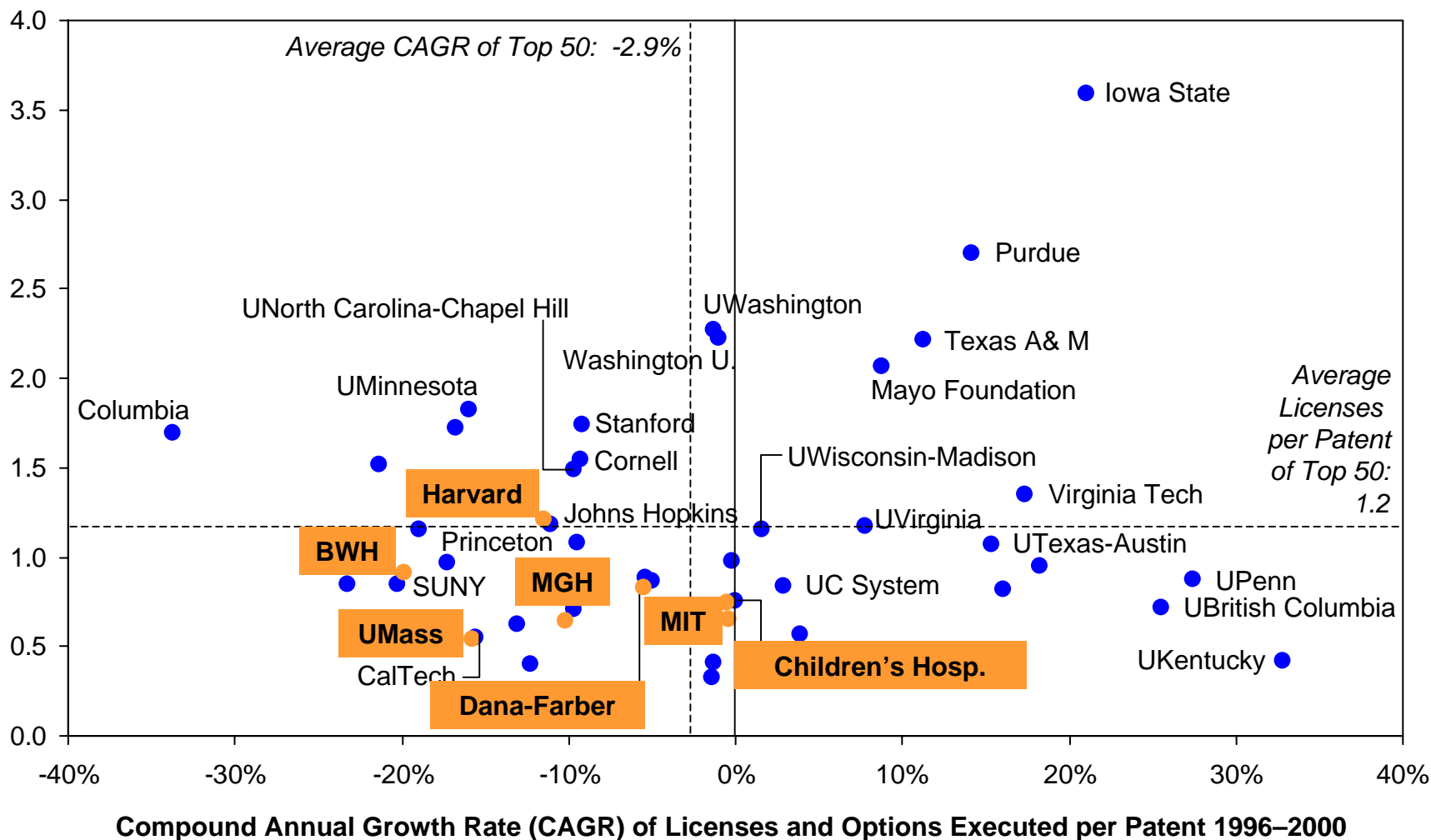


Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School and NIH Pubmed.



# Technology Transfer Effectiveness

Licenses and Options Executed per Patent, 1996–2000



Note: Dana-Farber values for 1996 are averages of 1995 and 1997  
 Source: AUTM Licensing Survey 1995–2000  
 analysis by Professor Michael E. Porter and Monitor Company Group

# Technology and Knowledge Transfer

## Key Issues

- The transfer of technology from research to commercialization is traditionally a **key competitive advantage** of the Massachusetts Life Sciences cluster

### However

- Other regions are catching up
  - Life Sciences research institutions in Massachusetts show only **average performance** on a number of technology transfer indicators
- Tech transfer performance is seen as **lagging in some institutions**, with cumbersome decision-making processes and inappropriate understanding of appropriate deal structures

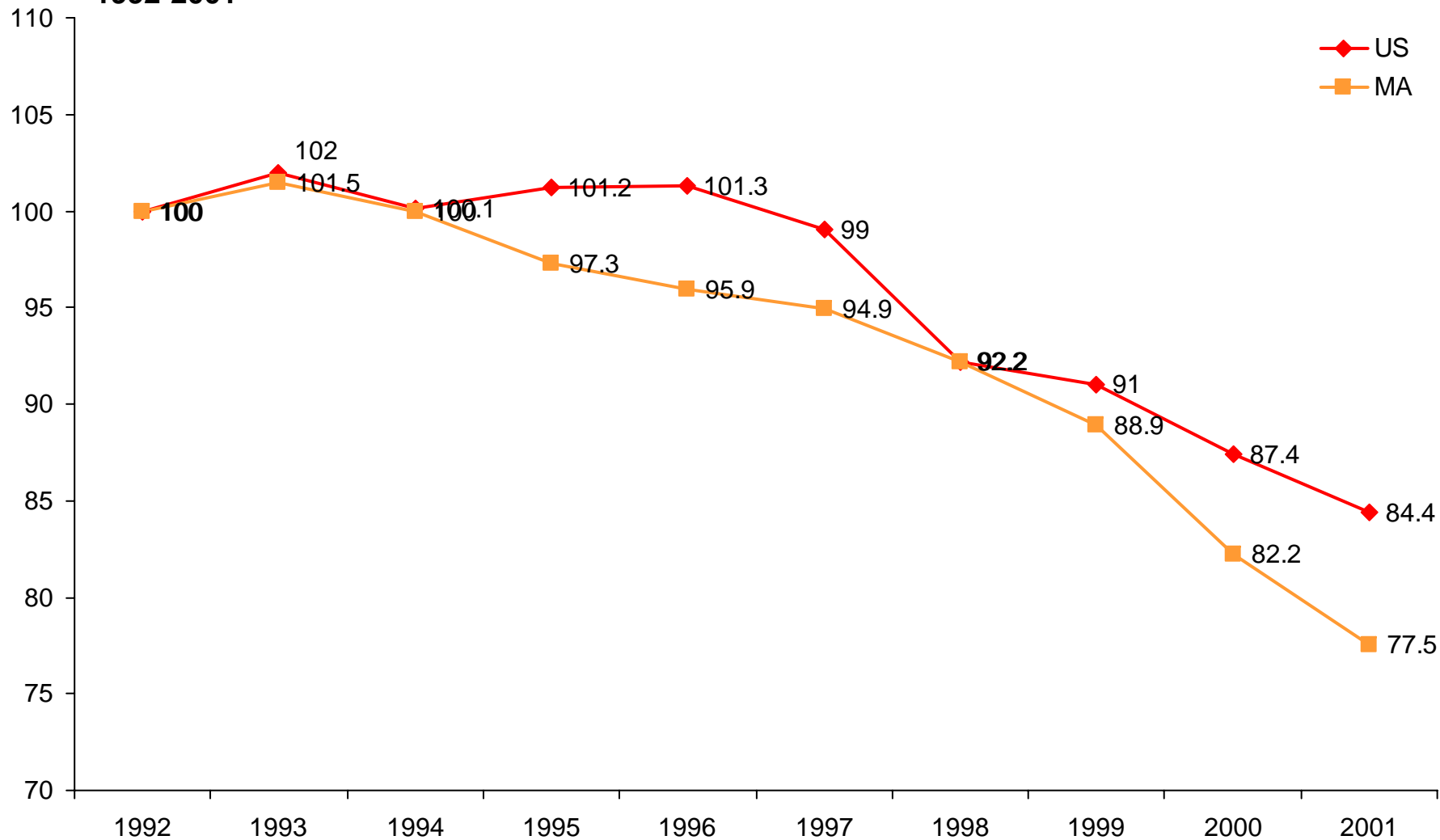


- The context for technology and knowledge transfer is **changing**
  - Pharmaceutical companies entering the cluster will need to establish new relationships with local research institutions
- Massachusetts' traditional **approach of knowledge transfer** via small start-up companies needs to evolve

# Massachusetts Life Sciences Cluster

## Health Care Delivery & Financing: Challenges Facing Physicians

Massachusetts Physician Practice Environment Index, 1992-2001



Source: Massachusetts Medical Society, MMS Index Report, March 2002

# Massachusetts Health Care Delivery

## Overview

- Competitiveness and innovation in a region are strongly influenced by **sophisticated local demand**
- Having the most advanced health care delivery offers major benefits **to the cluster** as well as to patient care
- While Massachusetts is seen as the home of demanding companies, research institutions, and medical practitioners, cost pressures, and **reimbursement structures** have the potential to slow down innovation
  - Health care delivery runs the risk of becoming driven by short-term cost reduction

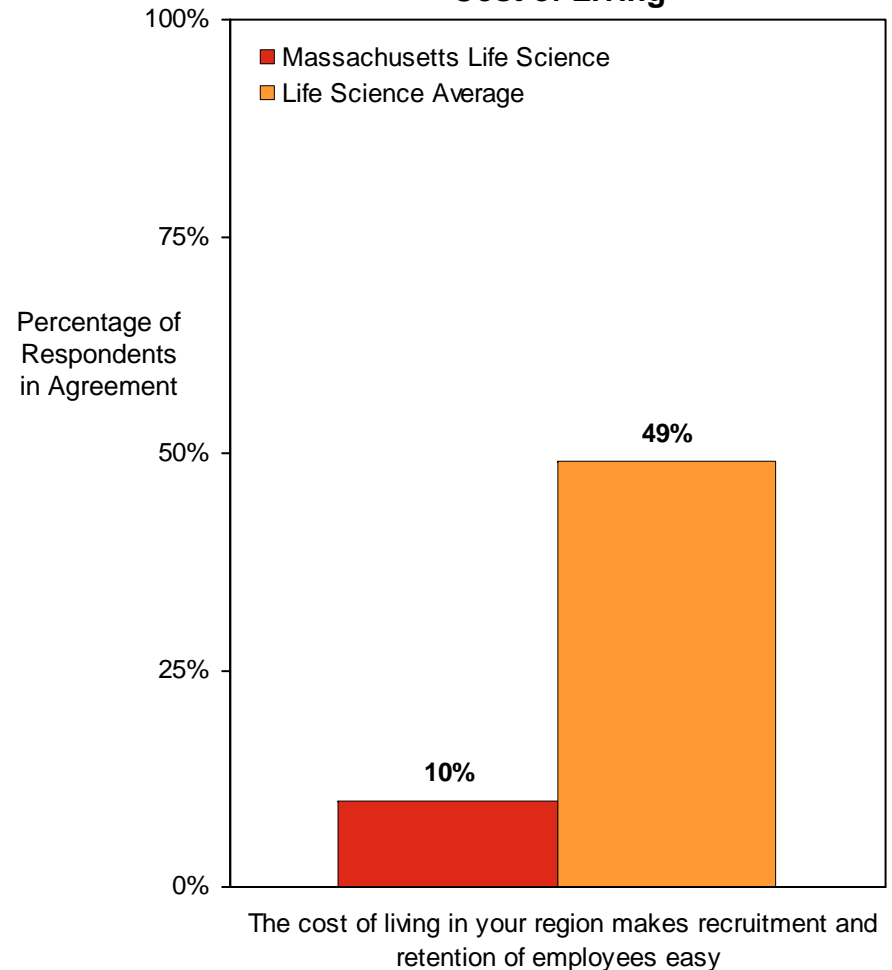
# Massachusetts Life Sciences Cluster

## Mid-Level Workforce Retention and Recruitment

### Highlights from the Survey and Interviews

- The cost of living in Massachusetts makes it **difficult to recruit employees** at all levels
  - *“The high cost of living, especially housing, makes it difficult to convince people to move to Boston.”*
    - Senior Executive, Hospital Organization
  - *“I don’t even try to recruit people from California anymore.”*
    - Senior Executive, Biotechnology Company
  - *“We pay higher salaries here, but we lose people because of housing costs.”*
    - Senior Executive, Medical Device Company

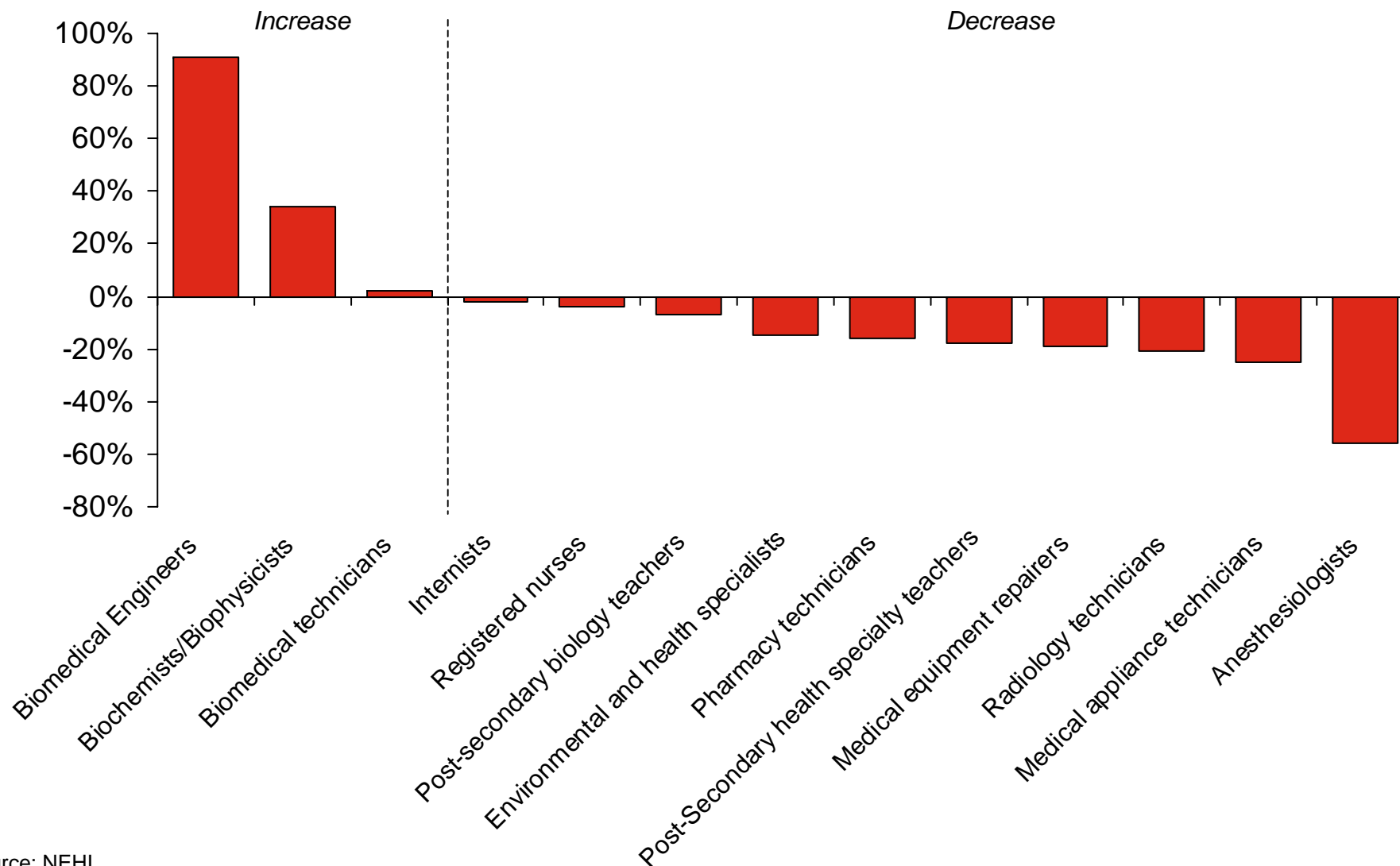
Massachusetts vs. Regional Average:  
Cost of Living



Note: Life Sciences average reflects data from the life sciences clusters of San Diego, Pittsburgh, and the Research Triangle  
Source: Professor Michael E. Porter and Monitor Company Group

# Mid-Level Workforce Employment Changes in Massachusetts

Change of Employment,  
1999 - 2001



Source: NEHI

# Mid-Level Workforce

## Overview

- The Massachusetts Life Sciences Cluster requires a strong base of mid-level professionals
  - **High cost of living** makes the Boston-region increasingly unattractive
  - The growth of corporate research facilities increases the pressure on hospitals and research institutions to **compete** for mid-level professionals
  - Educational institutions need to be equipped to **adjust supply** to meet the need for mid-level professionals



- A **strategy** is needed to expand the supply of needed skills for the cluster

# Clinical Trials

## Current Situation

- Nationwide, **2.3 million people** participated in industry- and government-funded clinical trials in 2002
  - In Massachusetts, an estimated 40 to 50,000 patients participated in clinical trials (ca. 2% of national trial participants vs. 2.2% of national population and 5.3% of life sciences employment)
- The **recruitment costs** for volunteers are rising
  - Spending on recruiting volunteers is rising nationwide by 18% annually, reaching \$500m in 2002 (ca. \$215 per volunteer)
- The **efficiency of carrying out clinical trials** is declining
  - Nearly 25% of those enrolled in clinical trials drop out before the trial is completed
  - Enrollment delays are increasingly pushing back the timetable for trials and product introduction



# Clinical Trials

## The Challenge for Massachusetts

- The environment for conducting clinical trials in Massachusetts gets **mixed reviews**
  - Many companies value the **close proximity to leading research hospitals**
  - However, there is widespread concern about the **lack of responsiveness** of teaching hospitals in conducting trials, and no mechanisms to facilitate the process of performing trials in the State

*“It is incredibly difficult to work with the hospitals here for clinical trials. I’d like to but it is just so difficult.”*      *Executive, Biotech Company*



- Increasing the quantity and efficiency of clinical trials conducted here by Massachusetts (and other) companies would be an important competitive advantage for the region
  - Clinical trials are a meaningful **source of revenue** for hospitals
  - Involvement in clinical trials can enhance the image and improve the **quality of health care delivery** in Massachusetts hospitals
  - Conducting clinical trials at nearby institutions is cost effective and improves the level of **innovation** throughout the cluster
- A **concerted strategy** is needed to address the barriers to conducting trials in Massachusetts, widen the array of hospitals involved in trials, and make the process of conducting trials more efficient

# Capturing Life Sciences Manufacturing

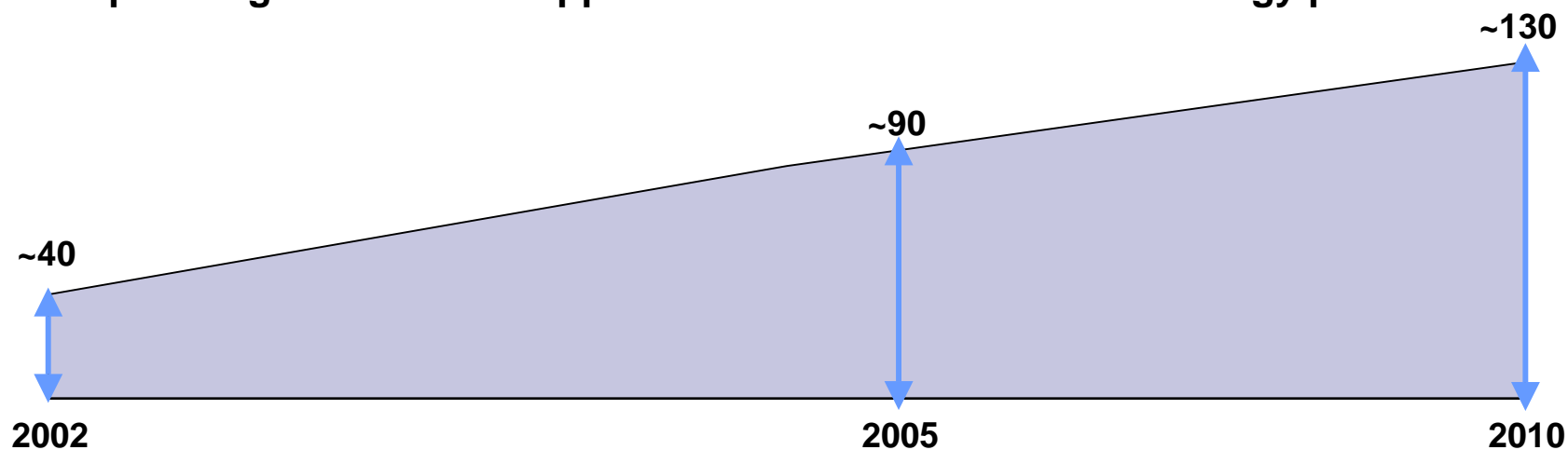
- Capturing downstream activities such as manufacturing represents a **major opportunity** for the Massachusetts Life Sciences cluster
  - The State economy would benefit from **new high-paying jobs** in downstream manufacturing activities (scaling of production, prototype manufacturing, full-scale production)
  - Companies in the cluster would **benefit from proximity** to their manufacturing operations to allow easier coordination, shorter reaction times, and reduced complexity of management supervision

*“There is a very delicate passing of the baton. The nth plant can be in Ireland – for the first one, the instinct is to go with Cambridge. We’d pay a 20% premium to stay here”*  
*Executive , Biotech Company*

- Massachusetts has a **strong product pipeline** and many companies will have to make manufacturing site decisions over the next several years

# Product Pipeline of the Massachusetts Life Sciences Cluster

Expected growth of FDA-approved Massachusetts Biotechnology products



Development phase	Current number of products	Probability of success <sup>(1)</sup>	Time to market <sup>(1)</sup>	Expected output
Phase I	63	21%	~6 years	13 compounds by 2008
Phase II	73	31%	~5 years	23 compounds by 2007
Phase III	48	59%	~3 years	28 compounds by 2005
Approval pending	23	91%	~1 year	21 compounds by 2003

(1) Based on average figures for new chemical entities (NCEs); BCG analysis; Tufts Center for the Study of Drug Development

Source: Biospace CCIS database; "A Revolution in R&D," BCG, November, 2001; BCG analysis

from Massachusetts Biotechnology Council, BCG- MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy

# Capturing Manufacturing in Life Sciences

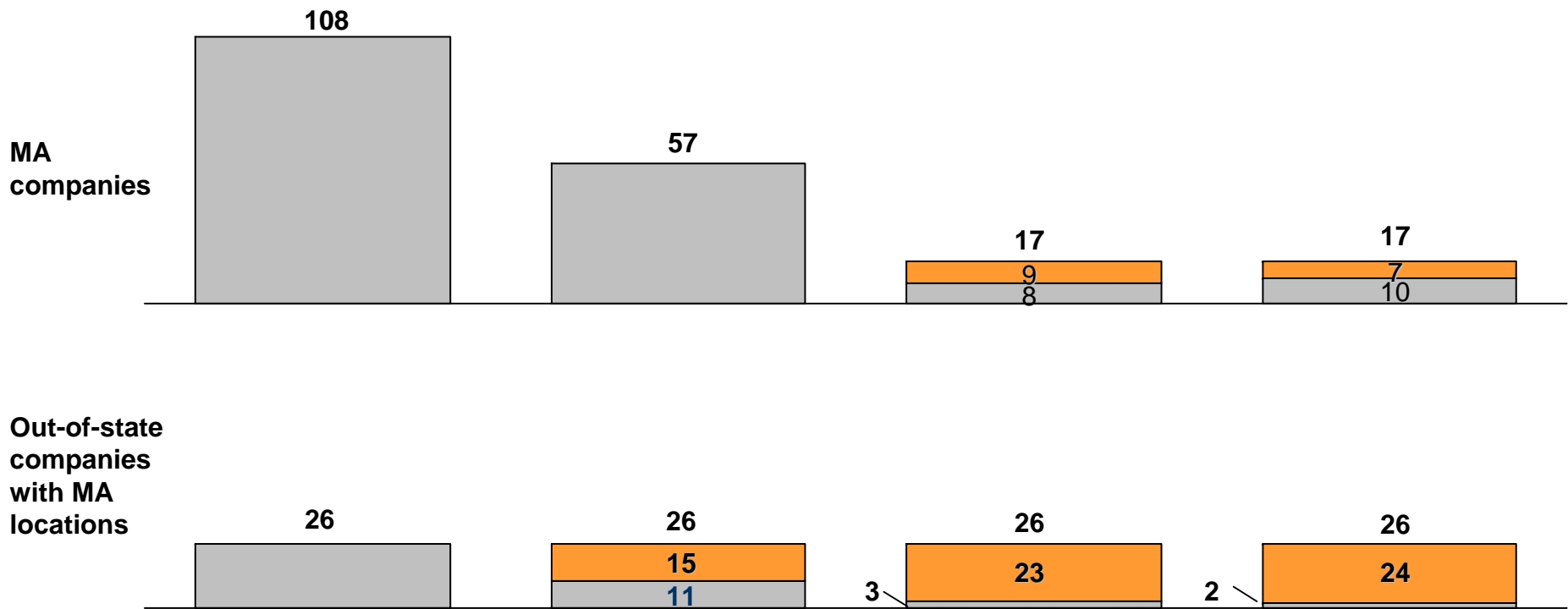
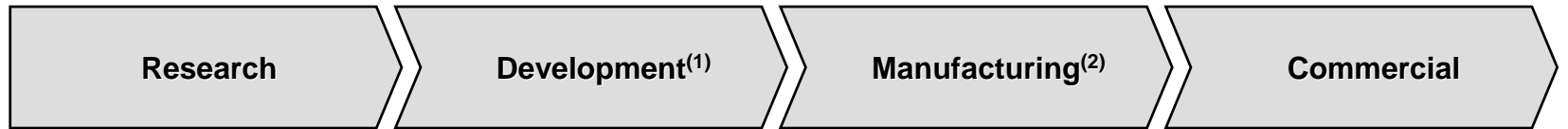
## Massachusetts' Current Position

- Companies report several competitive **disadvantages** for Massachusetts as a location for manufacturing
  - **High cost of doing business**  
*“Massachusetts is almost prohibitively expensive”*
  - **Delays and red tape:**  
*“Research Triangle has a reliable 6 week process”*
  - **Unpredictability of the local regulatory environment**  
*“In MA, you never know what problem you’ll run into with placing a manufacturing plant”*
- Most companies with operations in Massachusetts have located some manufacturing **outside** the State

**Source:** Massachusetts Biotechnology Council, Boston Consulting Group - MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy

# Massachusetts Life Sciences Cluster

## Location of Manufacturing



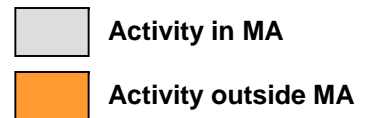
(1) Clinical development structure in state

(2) Commercial manufacturing only

Note: Sample is 134 human therapeutics companies

Source: Massachusetts Biotechnology Council Survey 2002, BCG analysis

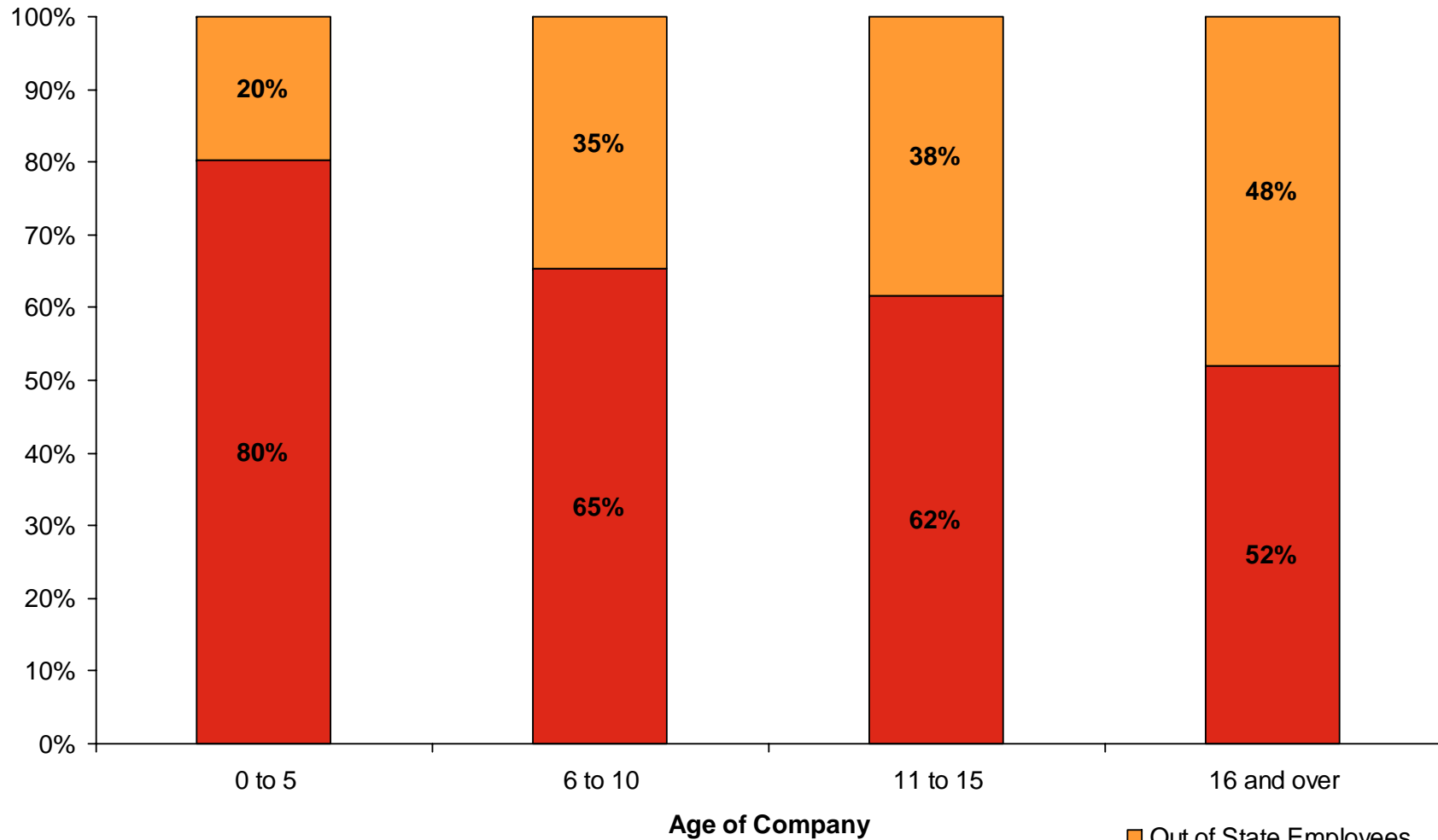
from Massachusetts Biotechnology Council, BCG - MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy



# Massachusetts Life Sciences Cluster

## Location of Manufacturing

% of Jobs in  
MA



■ Out of State Employees  
■ MA Employees

Note: Base Massachusetts headquartered companies

Source: MBC Survey 2002, Value Science, BCG analysis

from Massachusetts Biotechnology Council, BCG - MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy

# Capturing Manufacturing in Life Sciences

## The Need for a Strategy

- The Cluster needs to develop a **strategy** to increase its share of upcoming manufacturing investments, especially from companies already present in Massachusetts:
  - Development and **pre-qualification of suitable sites**, including permitting, and infrastructure provision
  - A **proactive approach** to companies facing manufacturing investment decisions
  - Efficient interaction with potential investors through **one point-of-contact**
  - An explicit program to assist in **workforce development**
  - Approaches to **minimizing the tax** burden consistent with the State's fiscal realities



- A successful strategy to attract and retain Life Sciences manufacturing in the State will need involve **State government, local governments, companies, universities, and other institutions**

# Other Strategic Issues Identified

- Strategy for recruiting outside investors to the State
- Biogrid / IT infrastructure for life sciences
- Technology mapping and identifying technology gaps



# Discussion Questions

- Are these the right issues?
- What are the priorities among them?

# Sources

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## **Massachusetts Life Sciences Data**

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Massachusetts Biotechnology Council, Boston Consulting Group

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## **The Medical Device Industry in Massachusetts**

Alan Clayton-Matthews, MassMedic, Massachusetts Medical Device Industry Council

<http://www.massmedic.com/01.pdf>

## **Why Care?**

The Howell Group of Boston

<http://www.whycare.info/pages/1/index.htm>

## **Massachusetts Life Sciences Cluster**

Professor Michael E. Porter and Monitor Company Group, L. P.

## **New Jersey Life Science Super-Cluster**

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<http://www.state.nj.us/prosperity/porter.shtml>

## **The Boston Life-Sciences Cluster**

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