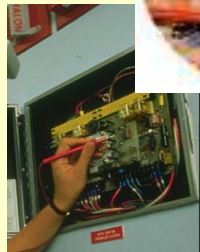
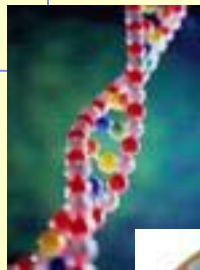


# Defining Tech Industries?

[www.smartpolicy.org/pdf/deftech.pdf](http://www.smartpolicy.org/pdf/deftech.pdf)



ACCRA Conference  
State/Province Research &  
Analysis Roundtable  
June 15, 2005

Jerry Paytas, Ph.D.  
Director

Center for Economic Development

# Key Points

## ◆ Defining Tech Industries

- How did do that?
- What is concealed?
- Why should anyone care?

## ◆ Defining Clusters

# How did they do that?

## ◆ Technology Employers

- Science and Engineering Occupations
- 2002 OES-NAICS crosswalks (4-6 digit)
- Tech = 3x US Avg for S&E workers

## ◆ Technology Generators

- NSF Survey of Industrial R&D (3-4 digit)
- R&D expenditures per employee
- Scientists and Engineers in Workforce

# What is concealed?

Statistics are like a bikini. What they reveal is suggestive, but what they conceal is vital.

*--Aaron Levenstein*

- ◆ Which companies are really high tech?
- ◆ Headquarter or branch?

# Garbage in....

- ◆ The government are very keen on amassing statistics. They collect them, add them, raise them to the  $n$ -th power, take the cube root and prepare wonderful diagrams. But you must never forget that every one of these figures comes in the first instance from the village watchman, who just puts down what he damn pleases.

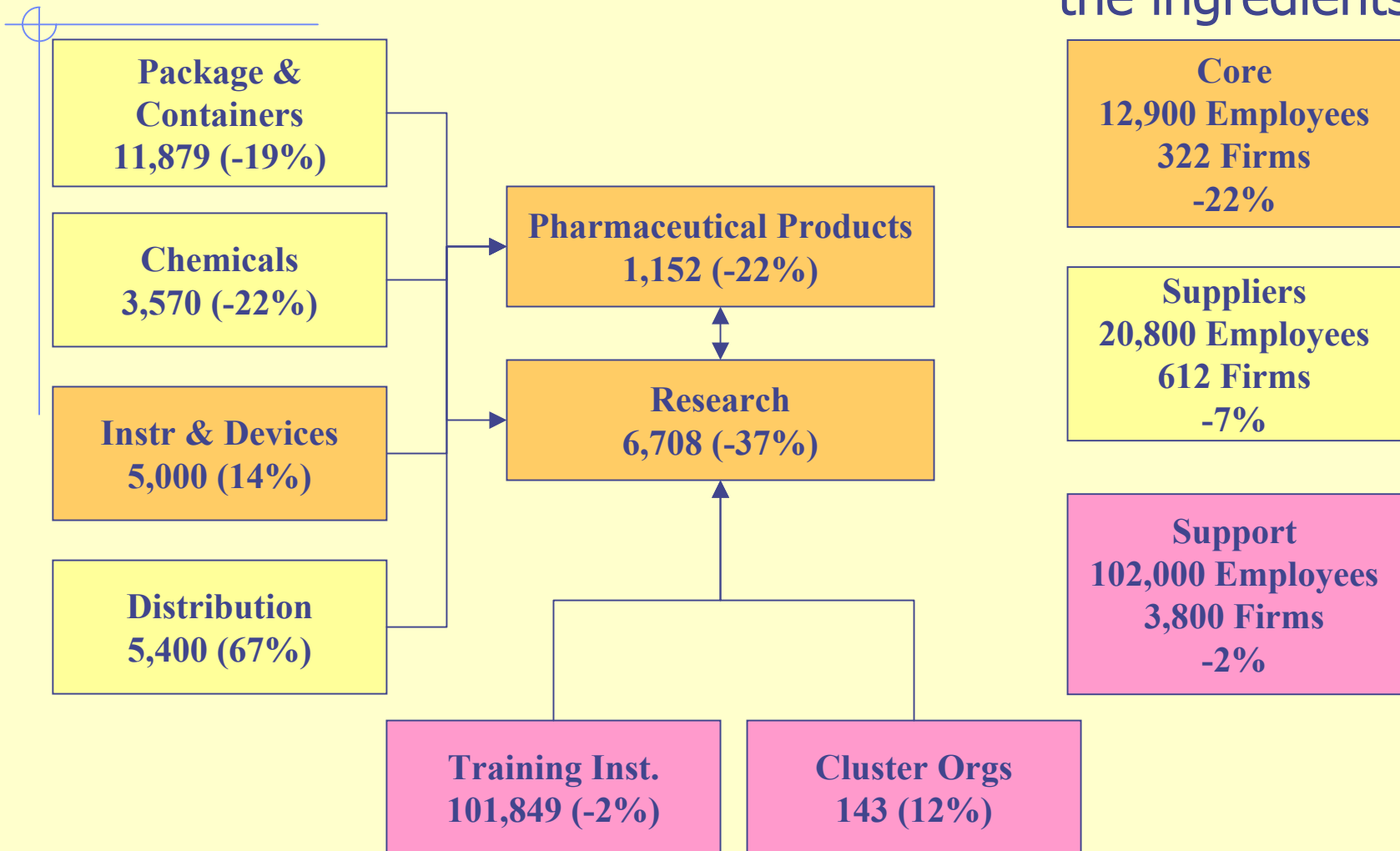
-- *Comment of an English judge*

# Defining Clusters

*The manipulation of statistical formulas is no substitute for knowing what one is doing -- Hubert M. Blalock, Jr.*

# Cluster Confusion

The flavor changes with the ingredients



# Why should anyone care?

- ◆ There are four kinds of lies: lies, damned lies, statistics and politicians quoting statistics.
- ◆ A judicious man uses statistics, not to get knowledge, but to save himself from having ignorance foisted upon him  
-- *Thomas Carlyle*



# More on Defining Clusters

...time permitting or as required

# Cluster Analysis Techniques

<b>Observational</b>	<b>Statistical</b>
Expert Opinion	Graph/Network Analysis
Focus Groups / Interviews	Innovation Benchmarking
Graph/Network Analysis	Industry-Occupation Matrix
Surveys	Input-Output Matrix
	Surveys
	Specialization Analysis (LQs)

# Defining Your Clusters

	Pro	Con
<b>Local (observations)</b>	Less time, cost Focus on critical needs interdependencies Flexible and current	Obscures broader patterns and linkages Cluster may not align with regional ones Confuse cause & effect
<b>Global (statistics)</b>	Comprehensive & objective Integrated with national/global trends Portrait of a region Identifies regional gaps	Lengthy & expensive Key sectors or critical exceptions may be obscured Data problems May excludes supporting sectors

# Cluster Structures

## ◆ Networked

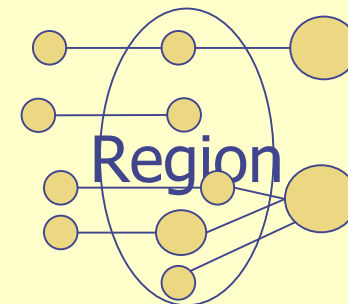
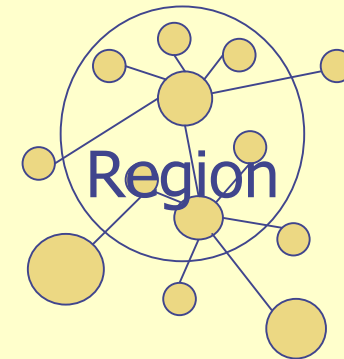
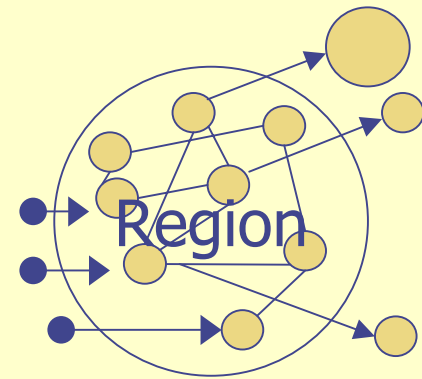
- Silicon Valley

## ◆ Hub and spoke

- Detroit

## ◆ Satellite

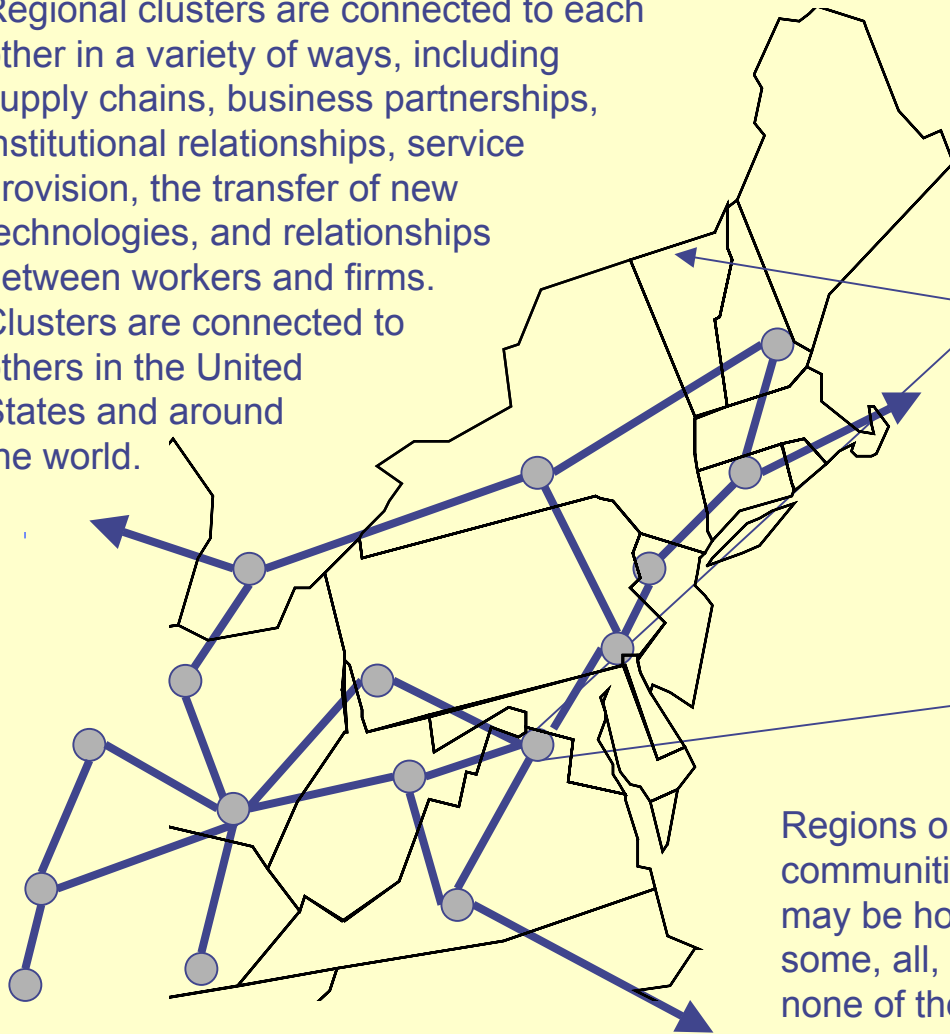
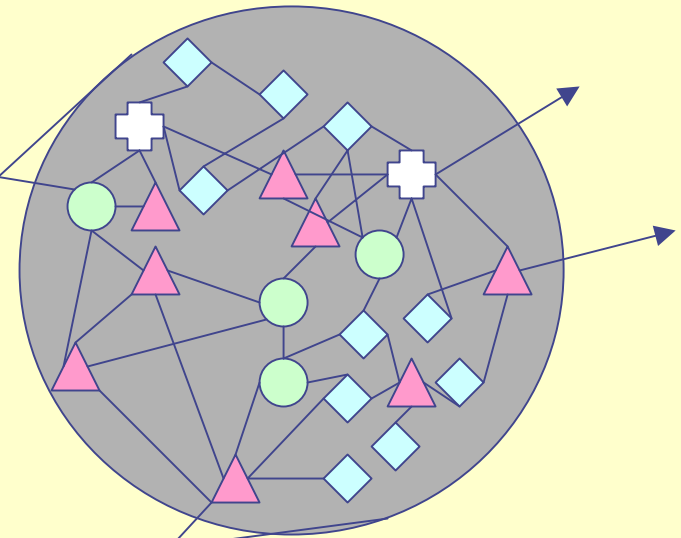
- Raleigh-Durham
- Albuquerque (State satellite)



# Communities and Regional Clusters





Regional clusters are connected to each other in a variety of ways, including supply chains, business partnerships, institutional relationships, service provision, the transfer of new technologies, and relationships between workers and firms. Clusters are connected to others in the United States and around the world.

Regional Cluster



Regions or communities may be home to some, all, or none of the regional cluster elements.

## Cluster Elements

-  Firm
-  Institution
-  Customer
-  Service Provider

# Cluster Factors

- ◆ Variety (in size and number)
  - Need depth of both small and large firms
- ◆ Innovative
  - Ability to adapt
  - Generate high value
- ◆ Market oriented
  - Don't compete on cost
  - Prospects for growth
  - Industry trends

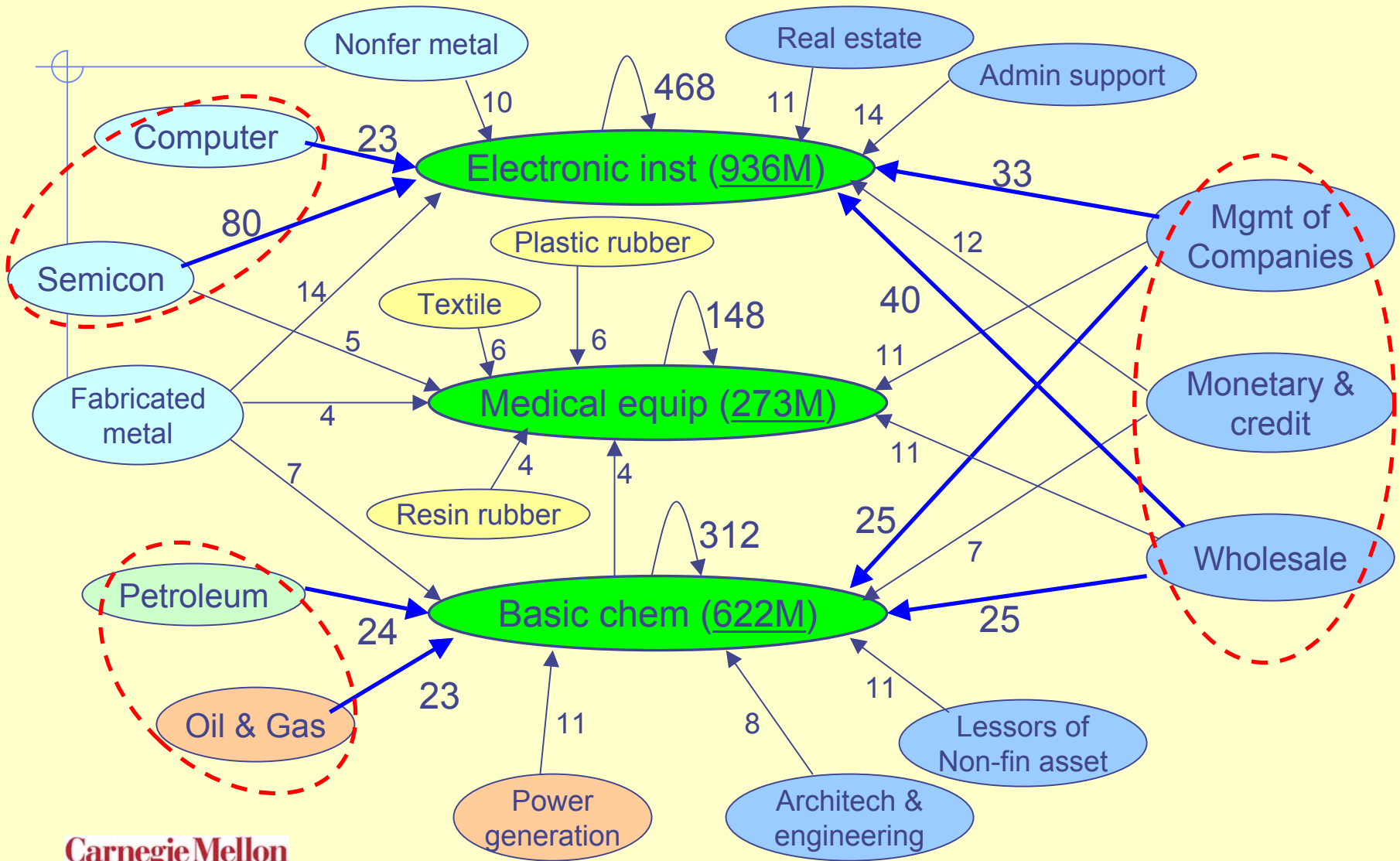
# Input-Output Matrix

	Industry A	Industry B	Industry C	Industry D	...	Total Final Uses	Total Commodity Output
Industry A	\$ 68,622	\$ 77	\$ 5,860	\$ 142,411		\$ 34,941	\$ 280,499
Industry B	\$ 367	\$ 31,477	\$ 7,368	\$ 81,721		\$ (39,240)	\$ 137,176
Industry C	\$ 3,368	\$ 4,693	\$ 895	\$ 28,745		\$ 787,207	\$ 1,006,175
Industry D	\$ 49,395	\$ 14,512	\$ 299,428	\$ 1,371,573		\$ 1,611,517	\$ 3,871,801
...							
Total Industry Output	\$ 282,422	\$ 147,816	\$ 1,006,174	\$ 3,964,771		\$ -	\$ 15,432,293

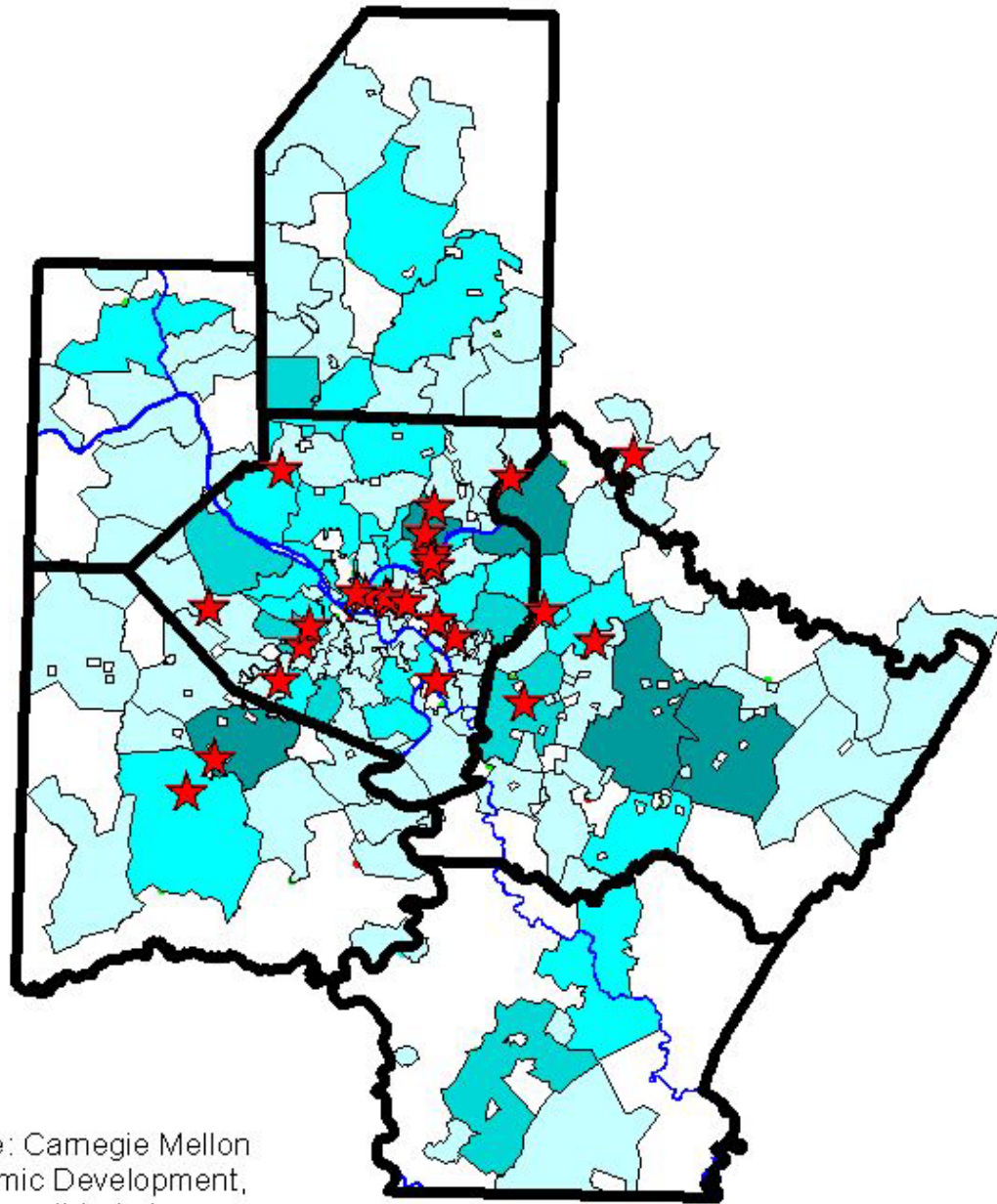
*Input-Output Data from the Bureau of Economic Analysis*

# Suppliers to core Biomedical industries in PGH MSA?

PGH MSA







**Map Legend**

- County (represented by a black outline)
- River (represented by a blue line)

**Company Legend**

- Core Device, Instrument, and Equipment Firms (represented by a red star)

**Related Cluster Firms by Zipcode**

- 0 (white square)
- 1-5 (lightest cyan square)
- 6-10 (light cyan square)
- 11-15 (medium cyan square)
- 16-34 (darkest cyan square)

Related cluster industries include:  
SIC 346, 349, 354, 367, 369, 38

Core Firm Source: Carnegie Mellon  
Center for Economic Development,  
Cluster Firm Source: iMarket

# Pittsburgh Region Core Medical Device, Instrument, and Equipment Companies and Related Cluster Firms

# The End

## Thank you