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*University of Missouri*  
COLUMBIA · KANSAS CITY · ROLLA · ST. LOUIS

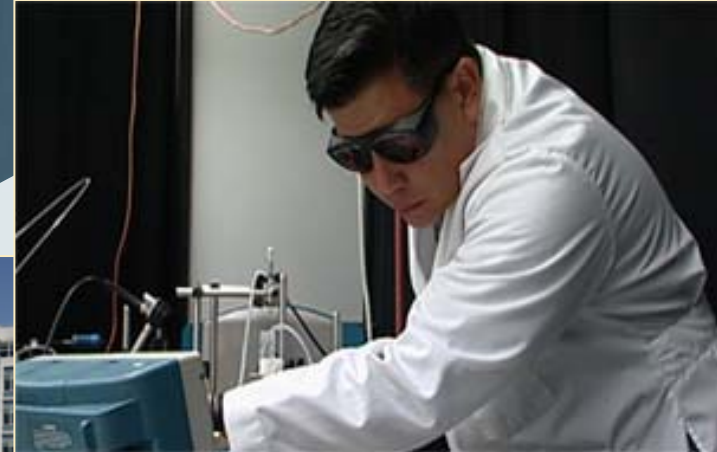


# Chairwoman Walker's 2008 theme

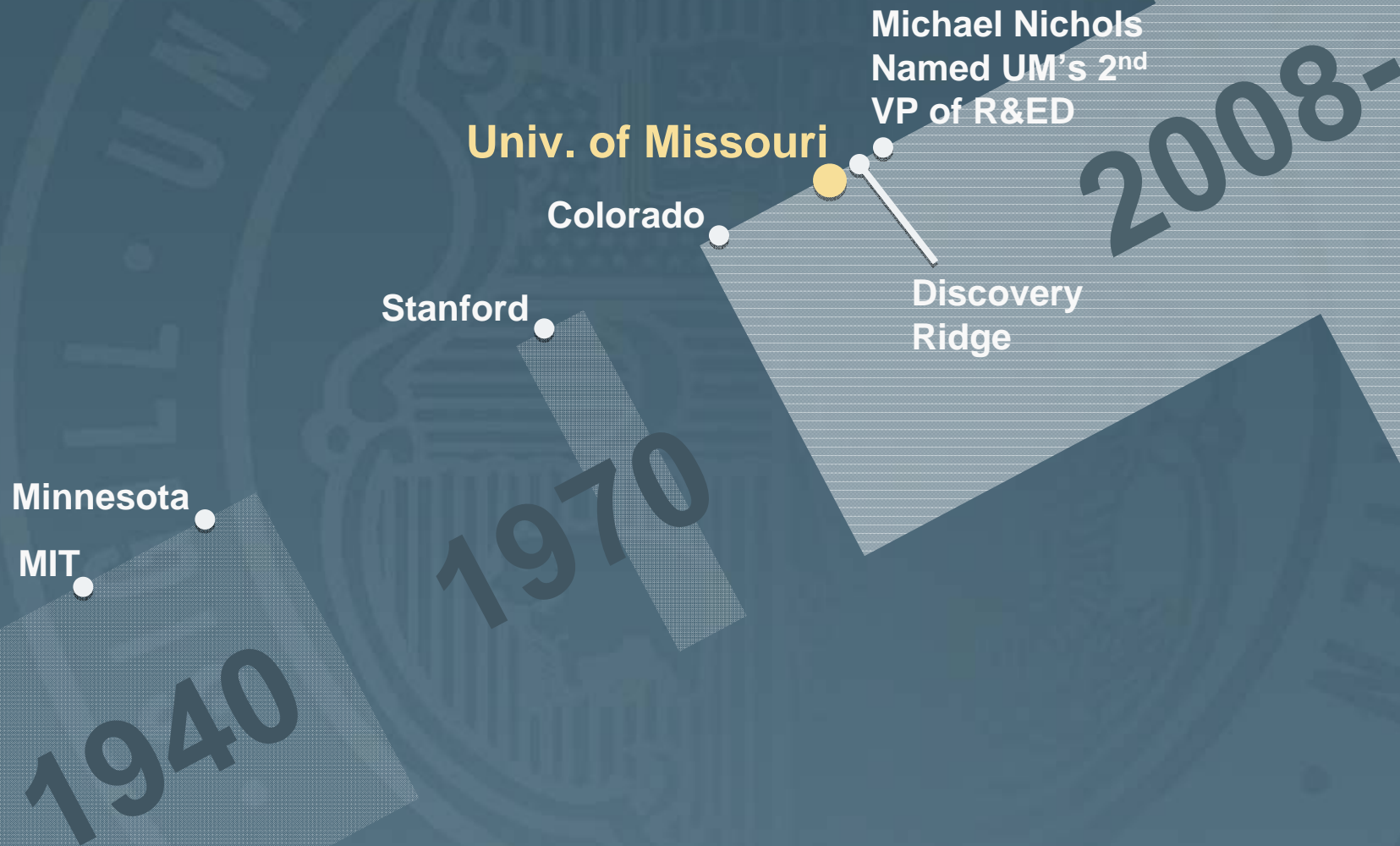
- Economic Development through research, life sciences and technology



# The mission and the legacy



# Our newest mission: economic development





# Michael Nichols

2008: UM VP of  
Research and  
Economic  
Development



1970s: MU  
graduate student



# ABC Labs comes to Discovery Ridge



# Technology-driven economic development

- The process by which knowledge is transformed into the products and services that fuel economic development to create wealth and generate improvements in the standard of living



# Why do we do this?

- It can help us satisfy the Bayh-Dole requirements for commercialization
- It can be used to recruit, reward, and retain faculty and students
- It can induce collaborations with industry
- It can generate income to promote and support teaching and research
- It can promote local, regional and state economic growth





# Merging of cultures

## University Values

Knowledge for  
Knowledge's Sake

### Economic Development

- Teaching
- Research
- Service

Academic Freedom  
Open Discourse

## Industry Values

Management of  
Knowledge for Profit

Profits

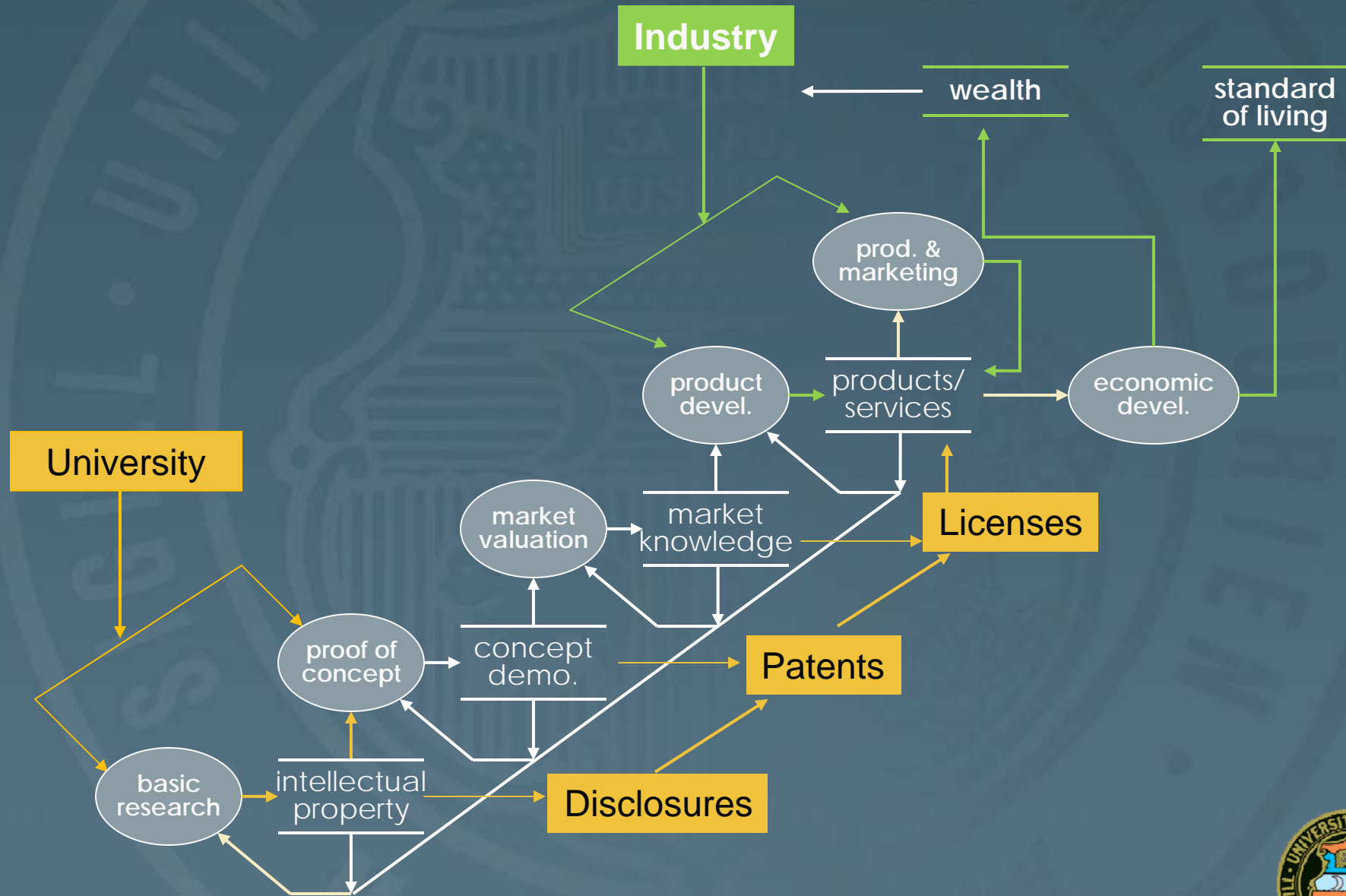
Product R&D

Confidentiality  
Limited Public Disclosure

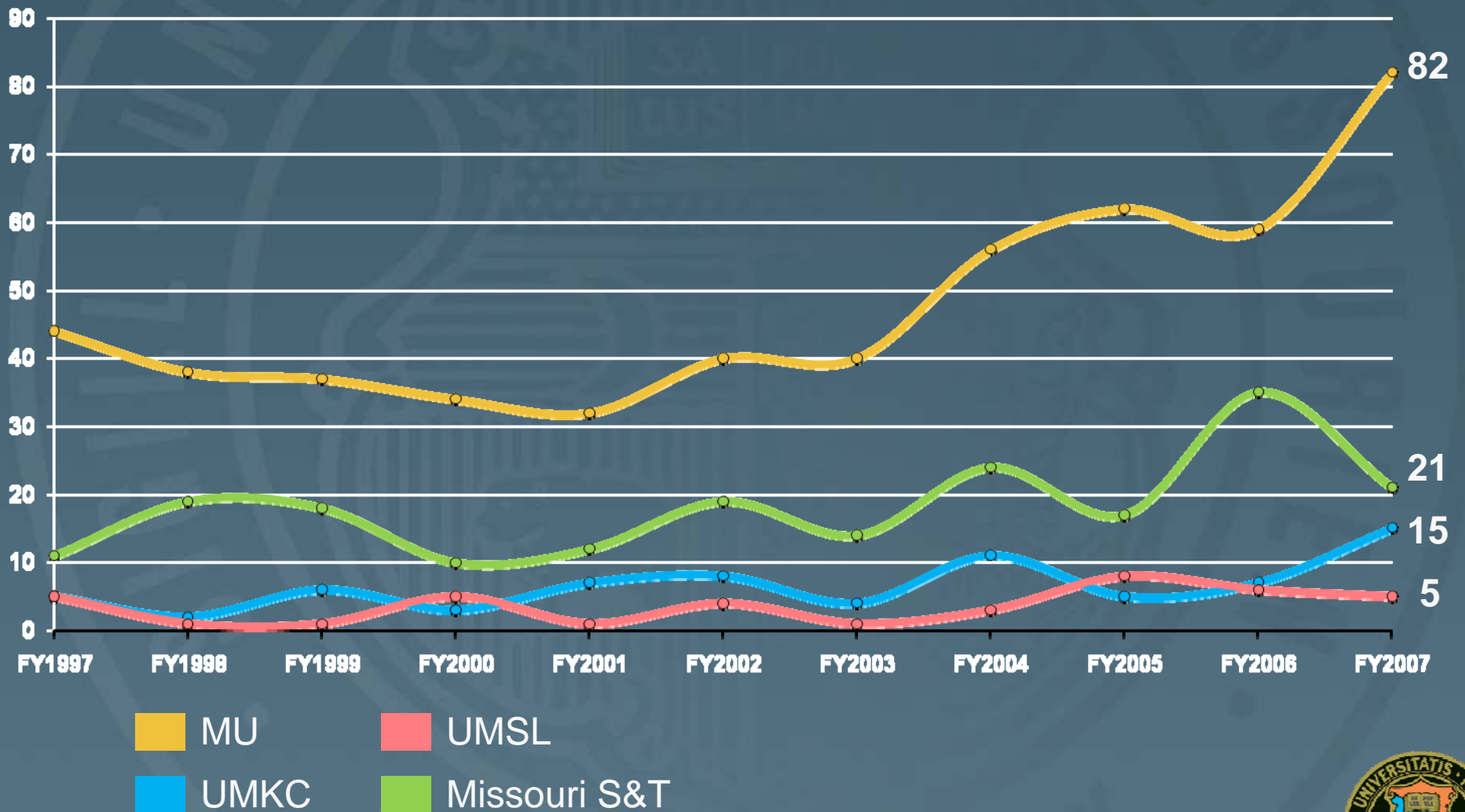
Commercialization  
of New and Useful  
Technologies



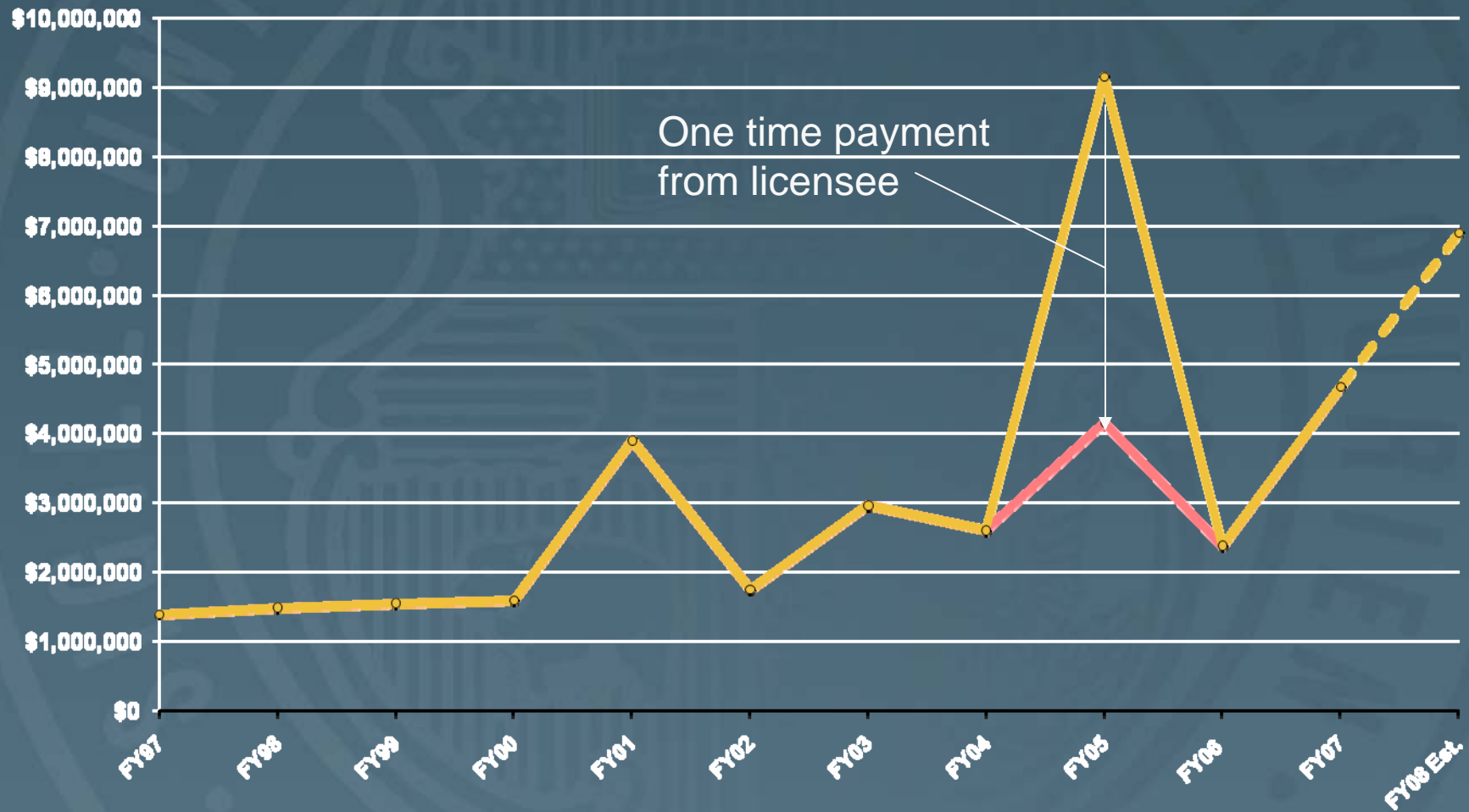
# Product development value chain



# Disclosures: what do they tell us?



# Licensing revenues-another classic metric





# Metrics for management

| Name           | Starting Year | FTE | \$ Res. Expend (RE) | Invent Disclose (ID) | RE/ ID ( \$2.5) | New Patents (NP) | NP/ ID | License Income (2006) | Start-ups |
|----------------|---------------|-----|---------------------|----------------------|-----------------|------------------|--------|-----------------------|-----------|
| MIT            | 1940          | 15  | 1.2B                | 523                  | 2.3             | 321              | .61    | 43M                   | 23        |
| Minn.          | 1957          | 18  | .6B                 | 230                  | 2.6             | 80               | .35    | 56M                   | 3         |
| Stanford       | 1970          | 13  | .7B                 | 518                  | 1.3             | 541              | 1.04   | 61M                   | 7         |
| UM             | 1987          | 7   | .3B                 | 107                  | 2.8             | 38               | .36    | 2.3M                  | 2         |
| North Carolina | 1985          | 5   | .6B                 | 97                   | 6.1             | 67               | .69    | 2.4M                  | 5         |
| Kansas         | 1994          | 2   | .13B                | 52                   | 2.5             | 22               | .42    | 0.23M                 | 0         |
| Colorado       | 1993          | 10  | .6B                 | 198                  | 3.0             | 120              | .61    | 21M                   | 10        |



# Targets for technology-based economic development

- Short range or attainable “Best in Class”
  - Grow Licensing Revenue > \$10M/year
    - In 2006 only 18% of 152 schools tracked by AUTM exceeded this amount
  - Maintain target filing of “new patents” at 60% of invention disclosures mirroring successful programs at MIT and Colorado
    - UM went from 36%(2006) to 62%(2007)
  - Generate more disclosures per \$ of research funding
    - UM(\$2.8M) → MIT(\$2.3M) → Stanford(\$1.3M)



# Goals for technology-based economic development

- Encourage Entrepreneurship at every level
  - Manage Risk and Conflicts of Interest
  - Reduce transactional friction
- Manage intellectual and real assets as investments
  - Returns should justify investments on a risk adjusted basis
- Make “sustainable growth” the key factor for improved funding at the institutional, local, state and federal levels for technology-based economic development initiatives.



# Our newest mission: the next 100 days and beyond...

- Sustainable Growth Model
- Connectivity
- Marketing Pipeline
- Passion for improvement

2008-

1940

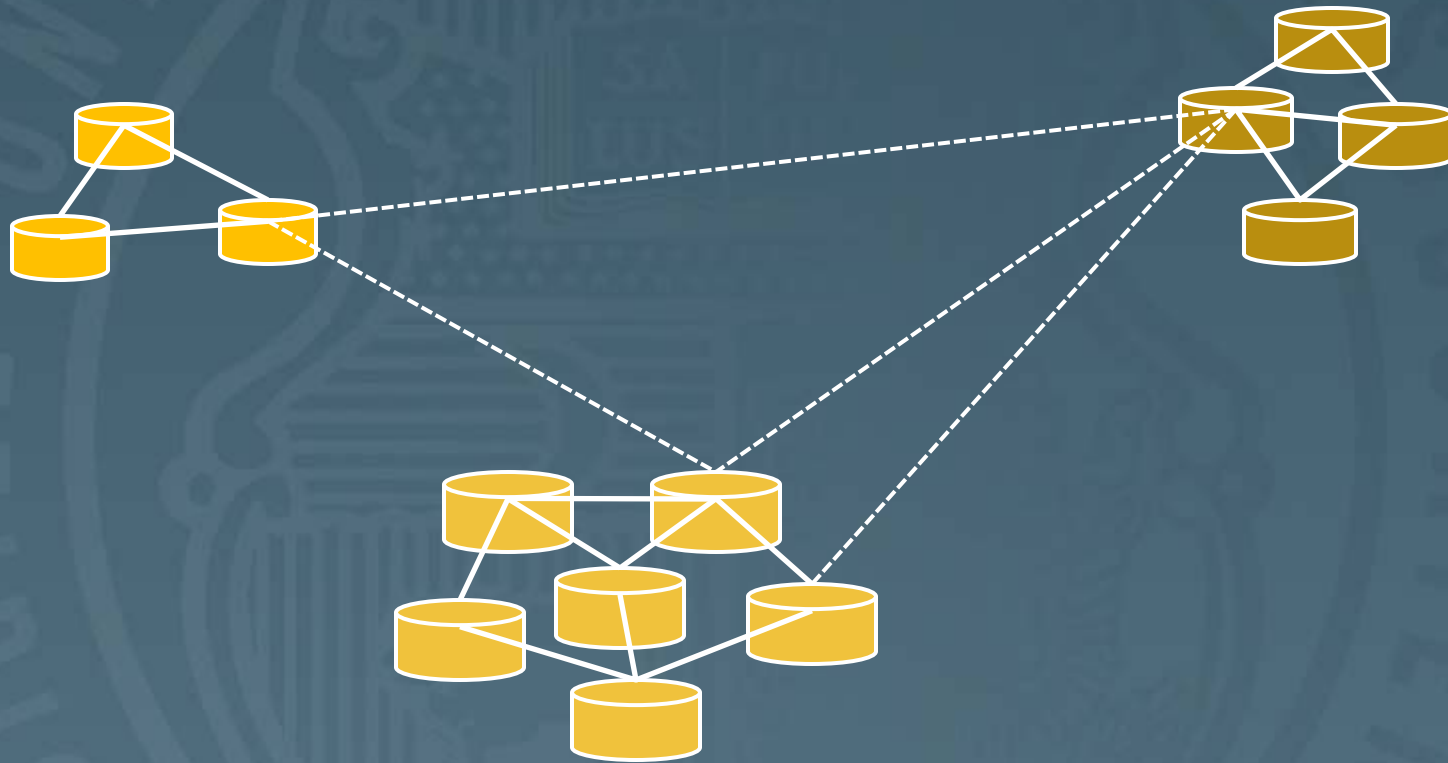




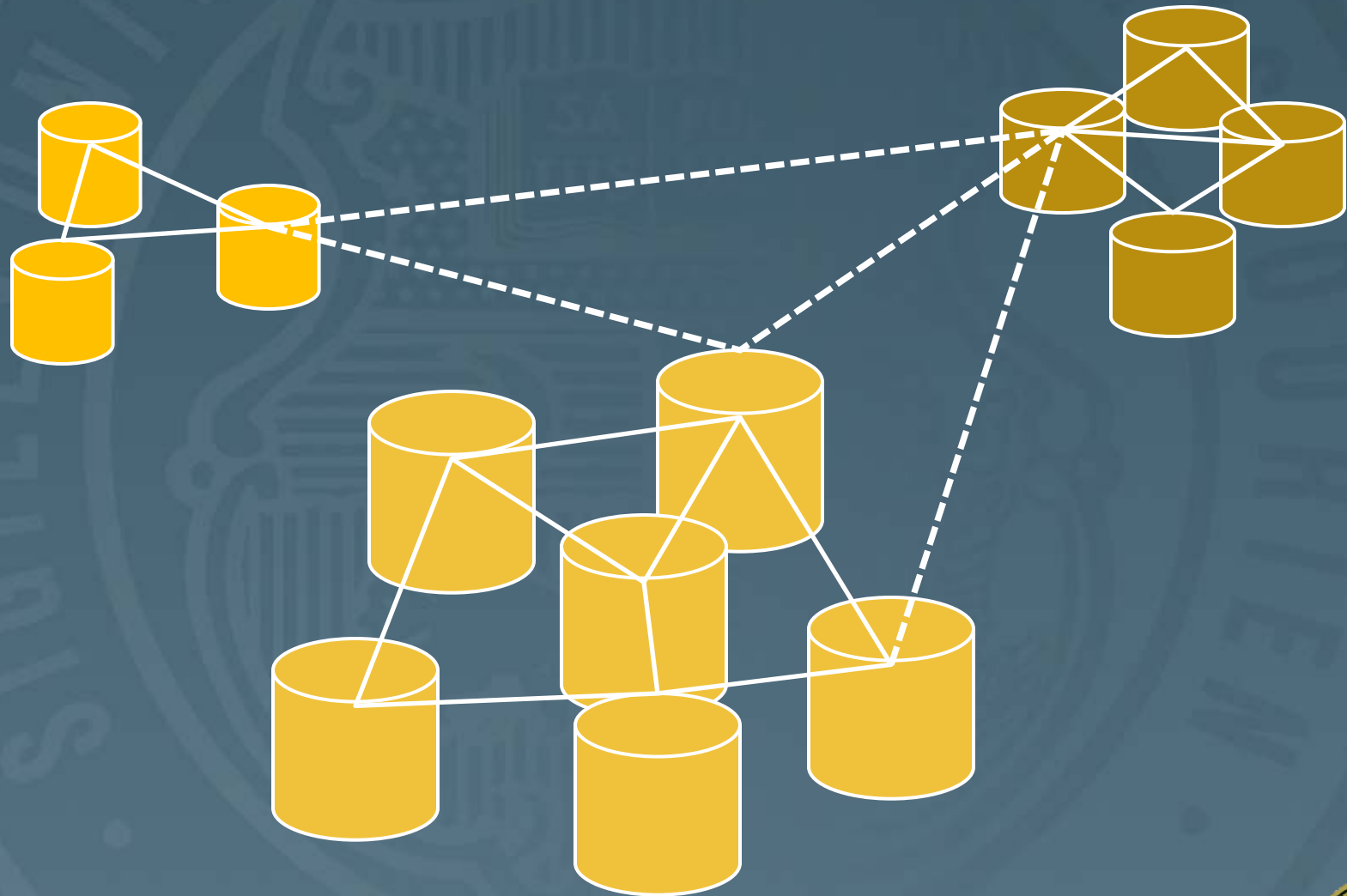
# Questions



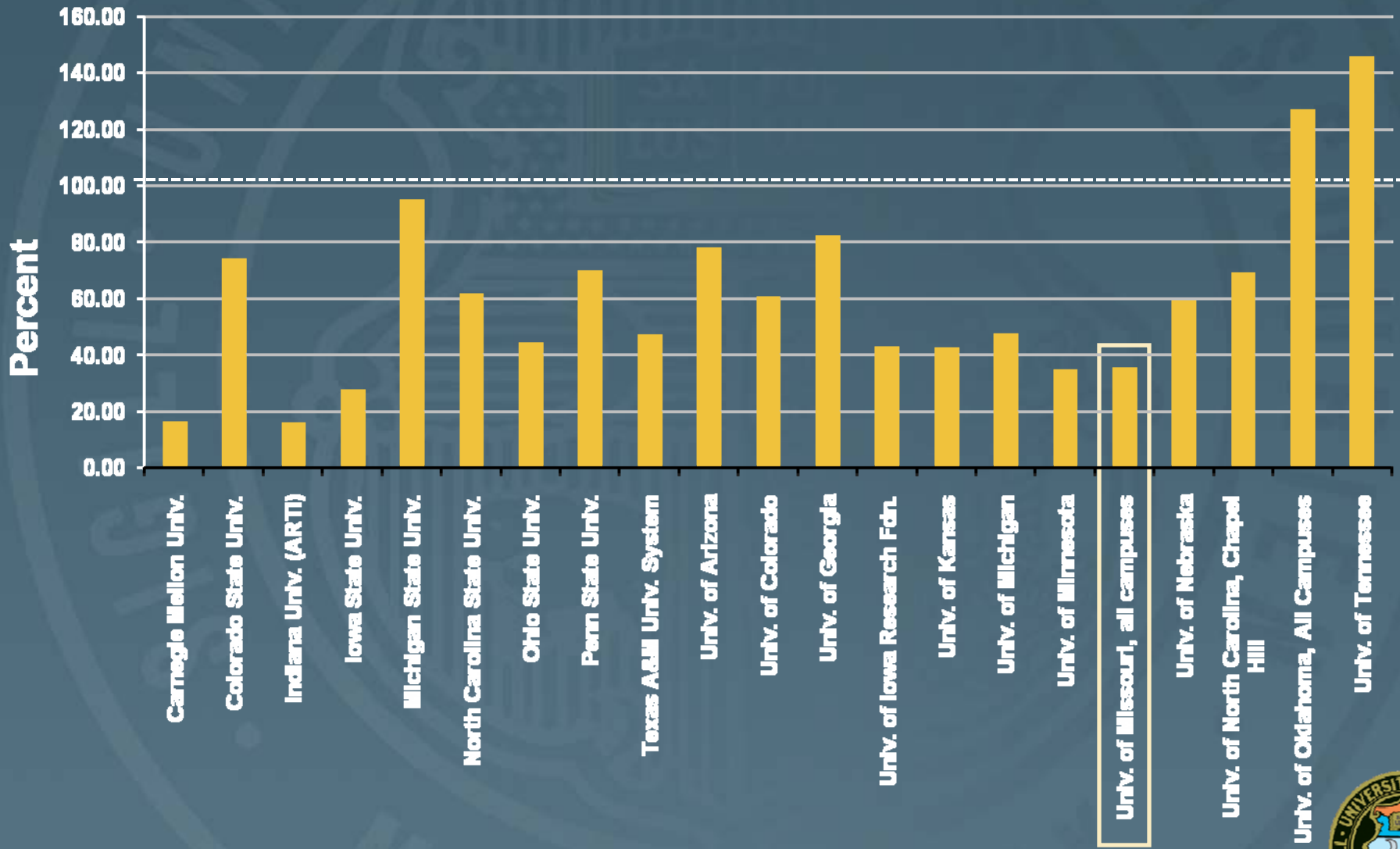
# Interdisciplinary networks



# Interdisciplinary networks: network value added



# Ratio of patent applications to invention disclosures received

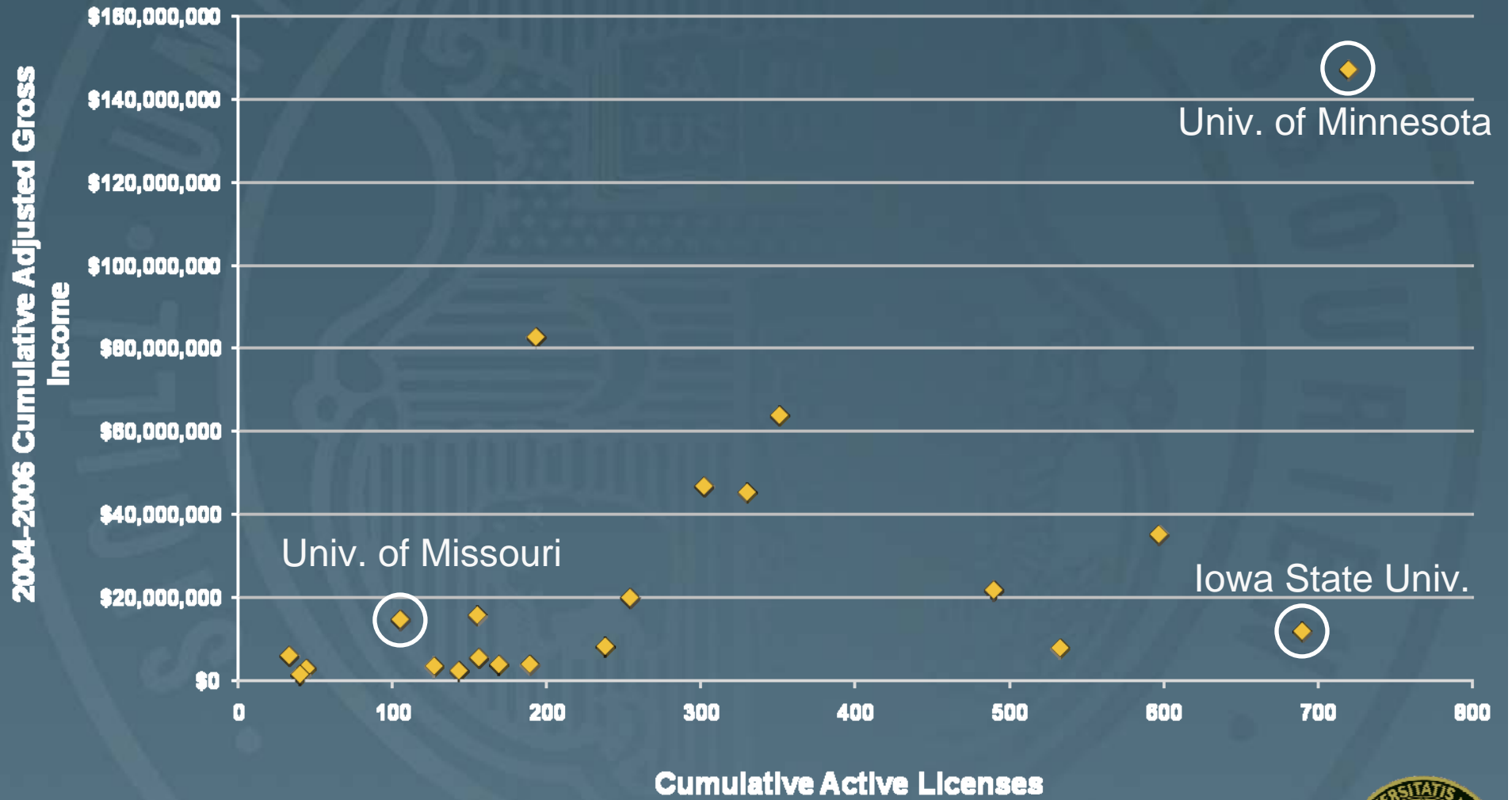




# 2006 expected disclosures vs. actual invention disclosures received



# Peer Group Comparison



# UM Funding from LSRB

|      |                       |             |      |
|------|-----------------------|-------------|------|
| MU   | Gateway Fund proposal | \$3,391,568 | LSRB |
| UMKC | Bone Fracture         | \$786,998   | LSRB |
| MUST | Johne's Disease       | \$675,000   | LSRB |
| UMKC | Microalgae            | \$526,906   | LSRB |
| UMKC | Biofuel crops         | \$558,020   | LSRB |
| UMKC | Chromatin Assembly    | \$318,624   | LSRB |
| UMKC | Animal Eye Disease    | \$312,273   | LSRB |
| MU   | St. Louis Biofuels    | \$355,642   | LSRB |
| UMSL | St. Louis Biofuels    | \$213,000   | LSRB |
| MU   | Bull Fertility        | \$400,000   | LSRB |
| MU   | Functional Foods      | \$738,281   | LSRB |

**\$8,276,312**



# UM Funding from MTC

|              |                            |             |     |
|--------------|----------------------------|-------------|-----|
| MU extension | SBIR program               | \$1,250,000 | MTC |
| MU/MUST      | Power Resource Center      | \$200,000   | MTC |
| MU/UMKC      | Animal Health Center       | \$200,000   | MTC |
| U of M       | Mo Venture Partners        | \$3,000,000 | MTC |
| MU           | Medical Device Innovation  | \$350,000   | MTC |
| UMSL         | High Performance Computing | \$850,000   | MTC |
| MU           | Emerging Firm Mapping      | \$35,000    | MTC |
| UMKC         | Open Innovation Network    | \$100,000   | MTC |
| MU/UMKC      | Interdisciplinary program  | \$350,000   | MTC |

**\$6,335,000**



# Recently approved MTC funding

| Type                        | Project Name  | Description                                       | University Campus | Amount of Funding |
|-----------------------------|---|---|-------------------|-------------------|
| Life Science Research Grant | Advancing Animal and Plant Agricultural Sciences  | Gateway project<br>PI: Dr. Marc Linit             | Columbia          | \$3,391,568       |
| Life Science Research Grant | Bone Fracture Repair in Animals Using a New Bone Cement   | Animal Health project<br>PI: Dr. David Eick       | Kansas City       | \$786,998         |
| Life Science Research Grant | Evaluation of Candidate Diagnostic Targets for Johne's Disease in Livestock   | Animal Health project<br>PI: Dr. Brian Geisbrecht | Kansas City       | \$675,000         |
| Life Science Research Grant | Integrated Program for the Development of Microalgae as Sustainable Resources for Biofuels and Biomaterials   | Bioenergy project<br>PI: Dr. Paul Nam             | Rolla             | \$526,906         |
| Life Science Research Grant | Ultrahigh-Throughput Sequence Profiling of Small RNA in <i>Brachypodium distachyon</i> , an emerging model for Cereal and Biofuel Crops   | Plant Science project<br>PI: Dr. Julia Chekanova  | Kansas City       | \$558,020         |
| Life Science Research Grant | Identification of Functional Replication and Transcription Linked to Residues for Chromatin Assembly by Histone H3 Proteins in the Corn Smut <i>Ustilago</i> and the Yeast <i>Saccharomyces</i> | Plant Science project<br>PI: Dr. Jakob Waterborg  | Kansas City       | \$318,624         |





# MTC funding (cont)

|                                      |   |  |                                    |             |
|--------------------------------------|---|--|------------------------------------|-------------|
| Life Science Research Grant          | Novel Therapeutic Strategies for the Treatment of Eye Diseases in Animal  | Animal Health<br>PI: Dr. Ashim Mitra   | Kansas City                        | \$312,273   |
| Life Science Research Grant          | Discovery and Utilization of Enzymes for Renewable Biofuels Production  | Bioenergy<br>PI: Dr. Himadri Pakrasi,<br>Washington University   | Columbia and St. Louis             | \$568,642   |
| Life Science Commercialization Grant | Commercialization of a Proprietary Bull Fertility Test  | Animal Health project<br>PI: Dr. Peter Sutovsky  | Columbia                           | \$400,000   |
| Life Science Commercialization Grant | Commercialization of Value-Added Food-Grade Soybean Lines Developed by the University of Missouri and New Generation Functional Food Ingredients and Plant-Made Component for Nutritional Retail Products | Gateway Fund<br>PI: Dr. Alex Stemme, Mid-America Research and Development Foundation   | Columbia and Delta Research Center | \$738,281   |
| Lewis and Clark Discovery Initiative | High Tech Small Business Incentive Program  | Partner with MoFAST program to administer Phase 0 grants and Phase I/II Bridge loans   | Columbia – Statewide               | \$1,250,000 |
| Lewis and Clark Discovery Initiative | Missouri Resource Power Center  | Develop power resource center. Partnership between University of Missouri-Columbia and Rolla campuses and Missouri Southern State University in Joplin | Columbia and Rolla                 | \$200,000   |



# MTC funding (cont)

|                                      |   |  |                          |  |
|--------------------------------------|---|--|--------------------------|--|
| Lewis and Clark Discovery Initiative | Animal Health and Nutrition Center  | Develop an animal health and nutrition center.<br>Partnership between University of Missouri Columbia and Kansas City campuses and the animal health companies in KC area. | Columbia and Kansas City | \$200,000  |
| Lewis and Clark Discovery Initiative | Missouri Venture Capital Partners   | Creation of a seed capital fund to invest in Missouri high technology businesses.  | All campuses.            | \$3,000,000 with total fund amount of \$15,000,000 |
| Lewis and Clark Discovery Initiative | Medical Device Innovation Program   | Program to mentor students to bring new patented surgical devices and engineered health care solutions into the healthcare market.   | Columbia and Kansas City | \$350,000  |
| Lewis and Clark Discovery Initiative | High Performance Computing Center   | Creation of High Performance Computing Center to assist with growth and development of IT companies in St. Louis.  | St. Louis                | \$850,000  |
| Lewis and Clark Discovery Initiative | Emerging Firms Mapping Project  | Mapping Missouri's high-tech entrepreneurial firms.  | Columbia                 | \$35,000   |
| Lewis and Clark Discovery Initiative | Missouri Open Innovation Network  |  | Kansas City              | \$100,000  |
| Lewis and Clark Discovery Initiative | Collaboration and Interdisciplinary Degree Program for Masters and Ph.D. Students |  | Columbia and Kansas City | \$350,000  |



# Qualitative success factors

- When we hear from stakeholders that we are:
  - Promoting a culture that results in sustainable growth of technology commercialization
  - Recognized for negotiating win-win outcomes that result in royalties not being the only issue on the table
  - Respecting academic values (i.e. publication restrictions)
  - Fulfilling our obligations to research sponsors (i.e. Bayh-Dole)
  - Leveraging **networking** relationships with individuals and corporations

