# Industry-University R&D Partnerships in the United States

Irwin Feller, Senior Visiting Scientist, American Association for the Advancement of Science

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#### Outline

- Framework: Levels of Relationships
- Learning as an Evolutionary Process
- Typology of Issues
- Recent Changes: Firms & Universities
- Principles for Collaborative R&D Partnerships
- Excluded Third Party Considerations

## Learning

- Parties have realized benefits and adjusted expectations to experiences
- New issues have surfaced
- Parties seeking to formulate revised principles to guide future collaborative relationships
- Principles are not practices

#### Framework

- R&D Exchanges
- R&D Partnerships
- Industry-University Relationships

### **Levels of Relationship**



# United States National Innovation System Characteristics

- Industry primary performer of r&d
- Universities primary performer of basic research
- Federal government primary source of funds for basic research (and thus of academic r&d)

### Magnitude of Financial Ties: I (FY2002)

- Universities perform 13% (\$36B) of total U.S. r&d and 54% of basic research
- Industry share of academic r&d: 7%
- Academic r&d is 1.3% of industry r&d of industry's estimated self-funded r&d (\$177 B)
- Federal share of academic r&d: 59%

#### **Magnitude of Financial Ties: II**

- Industry philanthropy to universities and college-- \$1.5B (cash and in-kind) (2003)
- University licensing revenue-\$1.1B (2004)

#### **Expectations and Accomplishments** (Findings from Engineering Research Centers)

- What do Firms Expect/Receive from Partnerships?
  - "Knowledge Generation and Transfer"
  - Access to new ideas
  - Opportunity to keep abreast of university-based research in a field
  - Access to specific faculty
  - Access to students as prospective hires
  - -Leverage Federal investments in basic research
- What do Universities Expect/Receive from Partnerships?
  - Funds to support faculty research/facilities
  - Funds to support graduate students
  - Internship/placement opportunities for students
  - Access to proprietary data/specialized equipment
  - Participation in state government economic development programs

# UC-Berkeley/Google, Microsoft, Sun Collaboration, 2005

- 3 Firms each to provide \$500,000 annually for 5 years to support new laboratory in computer design
- Support 6 faculty and 30 graduate students
- Pre-competitive generic research
- Nonproprietary, freely licensed licensed research
- Decline in DARPA support for academic computer science

# **Typology of Issues**

Size of Firm	Industry Funded R&D	Federal/Other Funded R&D
Large	<ul> <li>Ownership of Intellectual Property</li> <li>Royalty-free licenses</li> <li>Exclusive licenses</li> </ul>	<ul> <li>Upfront payments</li> <li>Royalty rates</li> <li>Sublicenses</li> <li>Patent filing costs</li> </ul>
Small	• Ownership of Intellectual Property	<ul><li> Equity</li><li> Royalty rates</li><li> Spin-offs</li></ul>

# **Supporting Actions: Universities**

- One-stop shopping: integration of Sponsored Research and Technology Transfer Offices
- Acceptance of publication delays (and deletion of proprietary material)
- Master agreements (with templates on disposition of intellectual property rights and provisions for mediation and arbitration)
- Risk management approach to intellectual property

# Surge in University Patent/Licensing Activities

Increases in:

- Number and size of technology transfer offices;
- Number of invention disclosures;
- Patent applications;
- Patents;
- Licenses;
- Start-up firms

#### **Contention about Licenses**

Shared recognition that most university inventions/patents are "embryonic technologies" leads to different positions on apportionment of costs and benefits of next steps

## **Industry Perspectives**

- Universities making excessive claims for IP ownership on industry sponsored research agreements
- Excessive claims for upfront payments, inconsistent with technical and economic uncertainties of academic inventions
- Alternative suppliers of basic research are available elsewhere

## **University Perspective**

Upfront fees/milestone payments are needed "incentives" to lead firms to make necessary additional investments to get the university technology to market.

# Changes in Universities Perspectives and Practices

- Increased acceptance of equity in lieu of royalties and fees
- Investments in "downstream" development of "embryonic technologies"
- Risk management strategies, consistent with low probabilities of industry funded r&d yielding economically significant inventions/patents

#### University-Industry Partnership, "Guiding Principles for University-Industry Endeavors" (IRI-NCRUA)

- #1 A successful university-industry collaboration should support the mission of each partner. Any effort in conflict with the mission of either party will ultimately fail
- #2 Institutional practices and national resources should focus on fostering appropriate long term relationships between universities and industry
- #3 Universities and industry should focus on the benefit to each party that will result from collaborations by streamlining negotiations to ensure timely conduct of the research and the development of the research findings

### **Excluded Third Party Benefits**

- Public interest science—diminished role of universities as independent, neutral sources of scientific and technical expertise
- Conflicts of individual and institutional interests
- Development of an "anti-commons" that impedes the flow of knowledge, and thus the rate of scientific discovery and technological innovation