IP In Sponsored Research Agreements:
A Perspective From the Chemical Industry

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Outline

► Quick facts & figures on research in the US
► Issues around sponsored research agreements and IP terms
► Differences between industry sectors
► Characteristics of the chemical industry
► Implications for IP terms in research agreements
► UIDP and new approaches
Although industry is the major performer and funder of R&D it contributes only about 6% of funding for university research.

Figure 4-3

SOURCE: National Science Foundation, Division of Science Resources Statistics, National Patterns of R&D Resources (annual series). See appendix table 4-5.

Science and Engineering Indicators 2008
Growth from Chemical Sciences R&D

$5 B/yr Chemical Industry R&D Funding

$1 B/yr Federal R&D Funding in Chemical Sciences

$10 B/yr Growth in Chemical Industry Operating Income*

$8 B/yr Growth in Taxes**

$40 B/yr GDP** Growth

0.6 M New Jobs/yr**

Basis:
*estimated from CCR study
**extrapolated from LANL study by Thayer, et al., April 2005 using REMI economic model
What is the Problem?

- Negotiation of intellectual property rights in sponsored research agreements has become a barrier to industry-university research collaboration in the United States.
  - more contentious
  - takes longer
  - increases transactional costs
  - little or no benefit results

- Companies will collaborate more with foreign universities/less with US universities
Dow Six Sigma Study of Cycle Time for Sponsored Research Agreements in US

Cycle Time (T6 out - T2 in) = Over 5 Months!

Min: 48 Days
Max: 506 Days

Avg. = 153 Days
Dow Study of Quality of IP Terms in Sponsored Research Agreements

Foreign Universities Provide More Favorable IP Terms to Sponsor

US Universities
- Sole university inventions assigned to Dow or owned jointly: 31%
- Sole university inventions solely owned by University: 69%

Foreign Universities
- Sole university inventions assigned to Dow or owned jointly: 15%
- Sole university inventions solely owned by University: 85%

Legend:
- Yellow: Sole university inventions assigned to Dow or owned jointly
- Light blue: Sole university inventions solely owned by University
2003 Industry Survey

Polled members of the External Technology Directors Network of the Industrial Research Institute

Question: Do you/your company agree with the following statements:
A) IP issues are an impediment to working with US universities
B) We sometimes choose to work with a foreign university (rather than a US university), and getting better IP terms is one of the reasons for doing this

Responses:
► 100% agreed with statement A
► 50% agreed with statement B
Characteristics of Chemical Industry

► Global (R&D, manufacturing, sales)
► Large Scale (companies are large due to high capital investment required for cost competitive manufacturing)
► Research Intensive (industry spending high relative to government spending)
► Long Development Timeline (for new products & processes)
► High Development Costs (for new products & processes)
► Low Profit Margins (profits due to sales volume)
► Direct Correspondence (between academic disciplines of chemistry & chemical engineering and the research performed in industry)
Global Chemical Industry Facts

Source: C&E News, July 2, 2007
Industry Sectors Differ in Business Models: Pharma & IT At Opposite Ends of Spectrum

► Pharmaceutical Industry
- drug discoveries are rare/a single invention is basis for a new product
- commercialization is expensive and slow
- product lifetime is long
- profit margins are high

► exclusive license is highly preferred
► royalty rates can be fairly high

► Information Technology
- each product uses many inventions
- commercialization is rapid
- product lifetime is short
- competitors engineer around IP to make look-alikes
- profit margins are low

► non-exclusive license with right to sub-license is preferred
► royalty-free or nominal royalty
The Chemical Industry is Closer to Pharma but...

**Pharmaceutical Industry**
- Drug discoveries are rare/a single invention is basis for a new product
- Commercialization is expensive and slow
  - Clinical trials and registration
- Product lifetime is long
- Profit margins are high (12-31%)
- Exclusive license is highly preferred
- Royalty rates can be fairly high

**Chemical Industry**
- New products are rare/inventions usually related to product or process improvements
- Commercialization is expensive and slow
  - Development, testing & capital costs
- Product lifetime is long
- Profit margins are low (6-11%)
- Exclusive license is highly preferred
- Royalty rates need to be fairly low
## Low Probability of Commercializing University Inventions

<table>
<thead>
<tr>
<th>Innovation Steps</th>
<th>Success Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal to Grant</td>
<td>1 in 10</td>
</tr>
<tr>
<td>Research to Publication</td>
<td>1 in 2</td>
</tr>
<tr>
<td>Publication to Patent</td>
<td>1 in 100</td>
</tr>
<tr>
<td>Patent to Profit</td>
<td>1 in 250</td>
</tr>
<tr>
<td><strong>Overall Probability</strong></td>
<td><strong>1 in 500,000</strong></td>
</tr>
</tbody>
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Source: “Understanding Innovation” T.A. Ring (Univ. of Utah), S.B. Butts (Dow Chemical), manuscript in preparation
Industry Carries All Costs and Risks of Invention Commercialization

► When a chemical company develops a technology
  ➢ Development costs typically exceed 100X discovery costs
  ➢ Cost for building a new world scale manufacturing plant is > $100MM
  ➢ Only 1 in 10 is successfully commercialized

► Company profits from innovation successes must pay total costs of innovation failures. Licensing models for inventions from sponsored research should reflect:
  ➢ high cost of development and commercialization
  ➢ high risk of failure
Why Companies Worry About Foreground IP

Companies want “reasonable control” of foreground IP (assured right to practice) because without this they may:

- Be unable to use technology developed with their funding (bad research investment)
- Have to pay licensing fees/royalties that make commercialization unattractive (bad business decision)
- Find that the university decides to license the technology to a competitor (worst nightmare)
What Company Sponsor Wants

- Royalty-free license to University background IP (BIP)
- Lowest cost for project
- Assignment of University sole & joint subject inventions
- No royalties for subject inventions
- University does not publish research results without sponsor’s permission
What Company Sponsor Wants & What University Should Offer

- Royalty-free license to University background IP (BIP)
- Lowest price for project
- Assignment of University sole & joint subject inventions
- No royalties for subject inventions
- University does not publish research results without sponsor’s permission

- Access to University BIP at fair price
- Company pays true cost including overhead
- Assured exclusive license to subject inventions
  - Sponsor pays patenting costs
  - Field limited license
  - Capped or limited royalty (field appropriate)
  - Research license for U
- University has right to publish results
The University-Industry Demonstration Partnership

- New organization operating under auspices of GUIRR (NAS), founded in 2006
- Companies and universities are developing new partnership paradigms that will benefit both
  - 81 organizations have joined UIDP
    - 52 universities
    - 26 companies
    - 3 foundation
    - (28 Friends)
  - First project is TurboNegotiator
  - Established a working group on Rev Proc 2007-47
  - Four meetings held (12/06, 04/07, 07/07, 12/07)
    - Next Meeting - April 2008 (Kauffman Foundation)
TurboNegotiator is...

► Tool for conducting negotiation of research agreement
  - Principle-based rather than policy-based
  - partners answer questions about project and partnership (researchers & contracting officers)
  - answers map project into project/IP space
  - takes into account project-specific parameters such as who framed the research problem, relative contributions from each partner (funding, results of previous research, non-commercial samples or equipment)
  - suggests starting point for negotiation of IP and other terms
  - Should reduce cycle time and produce more reasonable agreement
Why Should We Care?

► The US innovation engine is very powerful but not fully engaged for the benefit of society and the economy.

► Industry, Universities and National Laboratories are individually strong.

► The process for moving nascent technologies to commercialization is not effective.
  - *We can improve this!*