



Universities, innovation and IPR: Industry expectations and university practices

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Overview

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2. **General trends**
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Some 'historical' notes

- In 1980, US law was changed to allow universities to patent the results of publicly funded research

[**Bayh-Dole Act**, Pub. L. No. 96-517, 94 Stat. 3015 (1980), codified as 35 USC § 200-212, 301-307]

- “In fiscal year 2004 alone, approximately 154 U.S. universities reaped over \$1 billion in net patenting licensing income, executed 3928 new licenses, and were issued over 3800 U.S. Patents”

“In 2000, about half of the total licensing income generated by all [US] universities was earned by the top five”

[Bagley M. (2006), “Academic discourse and proprietary rights: Putting patents in their proper place”, *Boston College Law Rev* 47: 217]

General trends

- ↑↑ **patent applications and patents**
particularly (but not only) biomedical, chemical
and engineering
- ↑↑ **spin-outs**
- ↑↑ **industry funding of academic research**

[Blumenthal D. et al. (1996), “Relationships between academic institutions and industry in the life sciences – An industry survey”, *New England Journal of Medicine* 334: 368]

[Monotti A. & Ricketson S. (2003), *Universities and intellectual property: Ownership and exploitation*. Oxford: Oxford University Press]

General trends

- ↑↑ **'Material Transfer Agreements' (MTAs)**
 - The recipient of material from one organisation accepts various obligations to the donor organisation, e.g. to destroy or return any unused material, to name the donor as a co-author on any resulting paper, to submit any paper for pre-publication review (and to accept its suppression or amendment), or to assign any inventions relating to the use of the material to the donor.
 - Frightening how often MTAs are signed without proper consideration!!
 - MTAs are not necessarily temporally limited (⇒→ patents)!

Possible consequences

- Universities may achieve **greater financial independence** from governments

... but ...

Possible consequences

University priorities may change – e.g.

“Political science doesn’t make money – drop it!”

“Astronomy doesn’t make money and is expensive – drop it quickly!”

Blue sky research, which industry needs but often cannot afford, may be starved in favour of applied science → progress slows

[Royal Society UK (2003), Keeping science open: the effects of intellectual property policy on the conduct of science]

Possible consequences

Academics' priorities may change – e.g.

- **Give preference to research over teaching**
- **Select research projects for probability of making money**

→ **academic scientists are 'internalizing' new sets of 'values'**

Possible consequences

Universities **re-allocate scarce resources** to patenting and litigation

E.g. in 2002 US universities spent over \$200 million on litigation – more than 5 times the amount spent in 1991

[Leaf C. (2005), The law of unintended consequences, Fortune, 19 September 2005]

→ **Reduced funding for teaching and research!**

Possible consequences

- **Publications suppressed or delayed** to facilitate patenting (novelty requirement)
- Publications **vett**ed for damaging content
- **Conditions** imposed to submission for publication

E.g. 70% of MTAs relating to medicines contain publication restrictions

[Walsh J. P., Cho C. & Cohen W. M. (2005), *Patents, material transfers and access to research inputs in biomedical research*. Final Report to the National Academy of Sciences, 20.09.05.

<http://www2.druid.dk/conferences/viewpaper.php?id=776&cf=8>]

Possible consequences

- **Patent owners may refuse access to patented technology to academic researchers**

More than a quarter of licences issued by universities and research institutes include clauses **allowing the industry partner to delete information from publications**, while almost half allow the industry partner to insist on **delaying publication**.
[Thursby et al. 2003]

A large-scale survey conducted in 2005 by the **American Association for the Advancement of Science** shows that 35% of university-based researchers in the biosciences report that their work is being negatively affected by IPRs and MTAs.

58% declared that their work has been **delayed**

50% said that they had to **change** their research

28% reported having **abandoned** their research project

Possible consequences

“But what about the research exemption??”

Universities are increasingly being seen as just another commercial entity, a **legitimate target for litigation**

Cf. *Madey v Duke*

Iowa v Wiley

Rochester v Searle

Etc.

MOREOVER: Universities sue each other

⇒ **Loss of cooperation and cross-fertilisation**

Possible consequences

- **Culture of openness and sharing withers**

“56% [of geneticists] reported adverse data withholding effects on the education of students and post-doctoral researchers”

[Bagley M. (2006), “Academic discourse and proprietary rights: Putting patents in their proper place”, *Boston College Law Review* 47: 217]

19% of academic genetic researchers did not receive the last material requested, up from 10% in the period 2003-04 from the period 1997-99.

[Walsh J. P., Cho C. & Cohen W. M. (2005), *Patents, material transfers and access to research inputs in biomedical research*. Final Report to the National Academy of Sciences, 20.09.05]

Possible consequences

- **Culture of openness and sharing withers**

A postdoc in Boyer's lab after the founding of Genentech:

“There were only twelve of us in Boyer's lab, and one guy was singled out to have a confidential meeting with Herb and Bob Swanson. We all wondered what was going on, and he came back out and couldn't tell us. Right then, that very moment, things changed in the lab, and it sort of fell apart from that point.”

[Boly W. (1982), "Strained relations", *California Magazine* 7: 78, quoted in Shane S. (2002), *Academic entrepreneurship - University spinoffs and wealth creation*. Cheltenham: Edward Elgar: 281]

Possible consequences

■ Universities patent research tools

Academic research is generally many steps upstream of any final commercial product and often involves identifying or creating something that facilitates the downstream steps (e.g. a protein involved in a disease process, a biomarker in blood or urine). Where licences are granted for research tools that require a royalty on the end product, the **royalties can stack up** to the extent that the final product becomes commercially unfeasible.

[Heller M. & Eisenberg R. (1998), "Can patents deter innovation? The anticommons in biomedical research", *Science* 280: 298]

- ➡ Reach-through licence agreements or RTLAs:
"Imagine a carpenter having to pay Black & Decker a percentage of every kitchen he rebuilds." [Leaf 2005]

Possible consequences

- **Researchers' increasing conflicts of interest cause misrepresentations in their publications**
→ **The public loses trust in academics**

Krimsky S. et al. 1996, “Financial Interest of Authors in Scientific Journals: A Pilot Study of 14 Publications” in *Science & Engineering Ethics*:

Examined **789 articles in leading biomedical journals**: 34% of the articles met one or more of the criteria for possessing a financial interest; **none** of the articles revealed these financial interests.

Mayer S. 2006, “**Declaration of patent applications as financial interests: a survey of practice among authors of papers on molecular biology in *Nature***” in *Journal of Medical Ethics*:

2/3 of the papers in which authors had patent applications or company affiliations that might be considered to be competing financial interests **did not disclose** these.

“How did we get here?”

Intention behind the Bayh-Dole Act:

The overriding goal of the Bayh-Dole Act was and continues to be to produce the greatest **public benefit** - **not** to generate profit for universities.

The **Objectives mentioned in the Preamble** include:

“to promote the utilization of inventions”;

“[for inventions to be] used in a manner to promote free competition and enterprise without unduly encumbering future research and discovery”;

“[to] promote commercialization and public availability of inventions” and to “protect the public against nonuse or unreasonable use of inventions”.

→ whether patenting and licensing by the university is **at all** necessary to achieve these goals will often **vary** depending on the sector of technology and even the nature of the invention

“How did we get here?”

Intention of (some) universities/ TTOs:

A **survey of directors of TTOs** in 62 US universities, found that 70.5% of respondents rated **revenue** (in the form of royalties) as ‘extremely important’, making it the **most important** success indicator for TTOs. It was also found that the surveyed TTOs consider the **central university administration**, i.e. their paymasters, to regard licence revenue as the most important success indicator of TTOs.

[Thursby & Thursby 2005: 203]

“How did we get here?”

Intention of (some) universities/TTOS:

“I think the only value of a patent comes when you provide an exclusive arrangement. All the licenses that we have, according to our policies, are exclusives [...] You asked me about exclusive versus non-exclusive, but I am pretty much set up to get people to sign exclusives.”

[Owen-Smith J. (2000), *Public science, private science: the causes and consequences of patenting by research universities*. PhD Thesis, University of Arizona: 205, **interview with a staff member of a not very successful TTO**]

“Well, I suspect that at some point you come to a fork in the road and you have to make a choice between the most important thing, whether that is getting the licensing revenue or transferring the technology. We have chosen, time and again, that the most important thing is transferring the technology”

[Ibid.: 206, **interview with a staff member of a successful TTO**]

The role of the University?

- **Repositories of knowledge**
- **Generators of new knowledge to enter the public domain**
- **Havens for unforced research**
- **Educators**

OR

- **Contract research organisations**
- **Vendors of education and research results**

The role of the University?

2 ethical approaches:

“The disadvantages of the commercialisation of academic research are outweighed by the benefits”

OR

“There are certain academic values that should not be sacrificed, regardless of potential benefits”

Conclusion /1

The involvement of universities in patenting need not necessarily damage the nature or functioning of the university...

... but **careful control** is necessary.

Universities should not lose sight of the role of a university as a teaching institution and a repository of knowledge.

They must also remember that they too risk becoming legitimate targets for patent-related litigation.

Conclusion /2

“When money is on the table, it seems, universities take a narrow view of the public interest. Most universities define the mission of technology transfer in language that highlights benefits to society ... However, social benefits or the public good can be slippery terms, subject to many interpretations”.

[Geiger R. & Sa C. (2008), *Tapping the Riches of Science. Universities and the Promise of Economic Growth*. Cambridge: Harvard University Press: 146]

Conclusion /3

“I believe that the future of the research university is dependent on the nature of the values and objectives informing the university’s leadership at all levels. Most of all it depends on a vision of who we are and what we would like to become. It depends on understanding, for example, what we as a university would not allow ourselves to do even if offered additional resources...”

[Shapiro H. (2005), *A Larger Sense of Purpose: Higher Education and Society*. Princeton: Princeton University Press: xvi]

Thank you for listening!

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