

Patenting in Swiss academic institutions



24 June 2014 – Raluca Flükiger




1. Why patent ?
2. Technology transfer in Swiss academic institutions
3. Patenting and commercializing academic inventions

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Competition


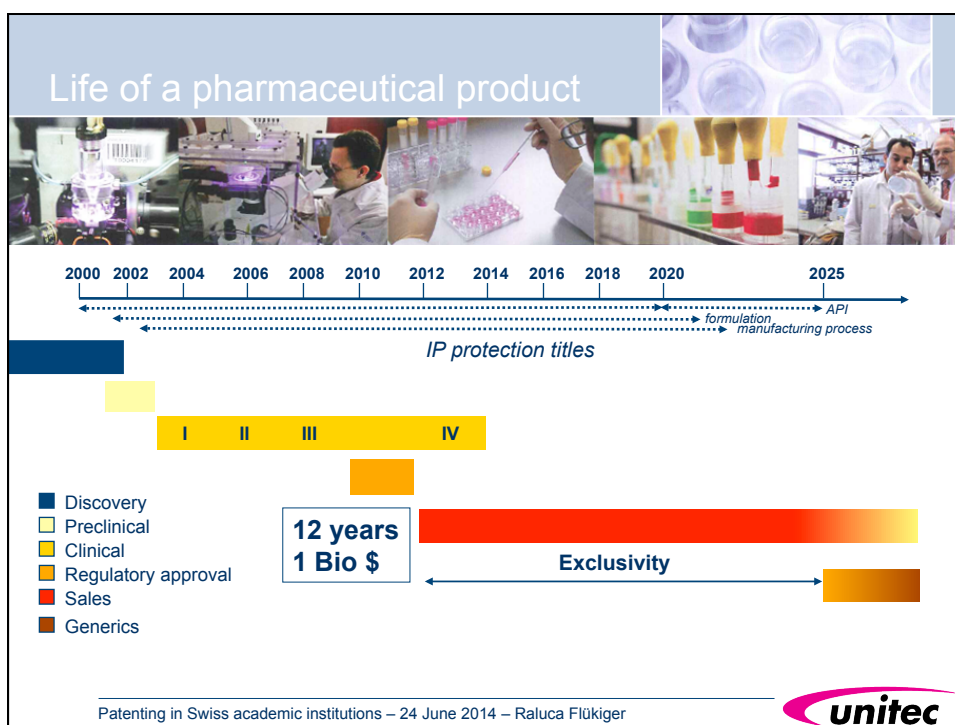


competition

you

Exclusivity

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Patents



- ♦ Exclusive right granted by a government
- ♦ Limited term (20 years)
- ♦ Obligation to disclose

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Advantages of patenting



- ♦ Exclusivity
 - keeps off the competition
 - scares off the competition
 - marketing tool (« Patent pending »)
- ♦ Once patent application has been filed, you don't need to keep innovation secret anymore.
- ♦ Provides a tradable currency

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Disadvantages of patenting



- ♦ Costs
- ♦ Not always easy to enforce
- ♦ Disclosure (information used by competition, risk of infringement...)

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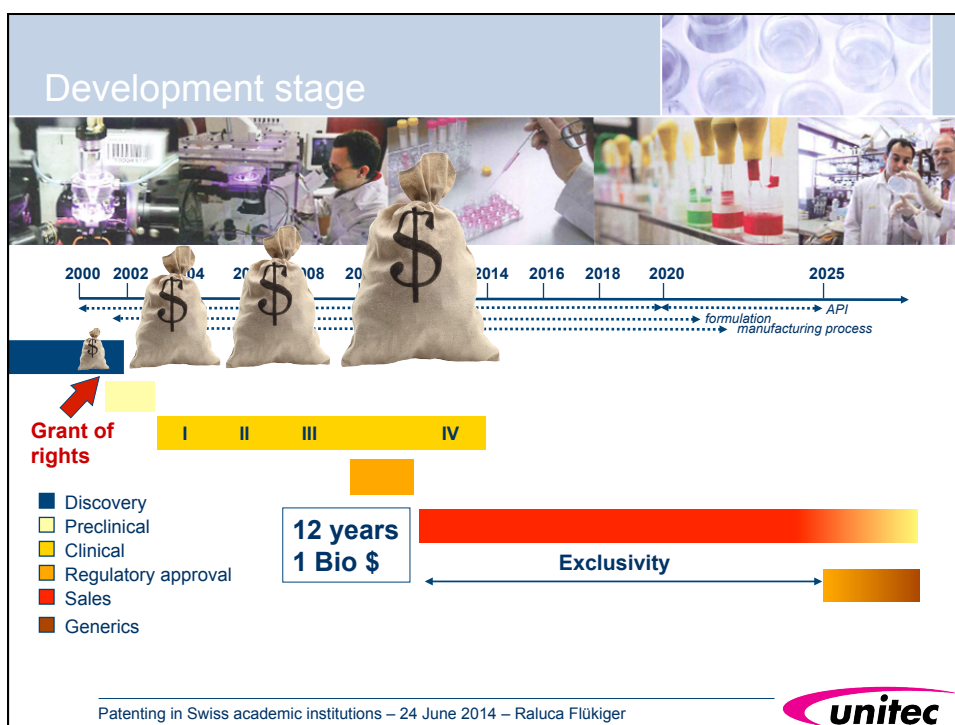
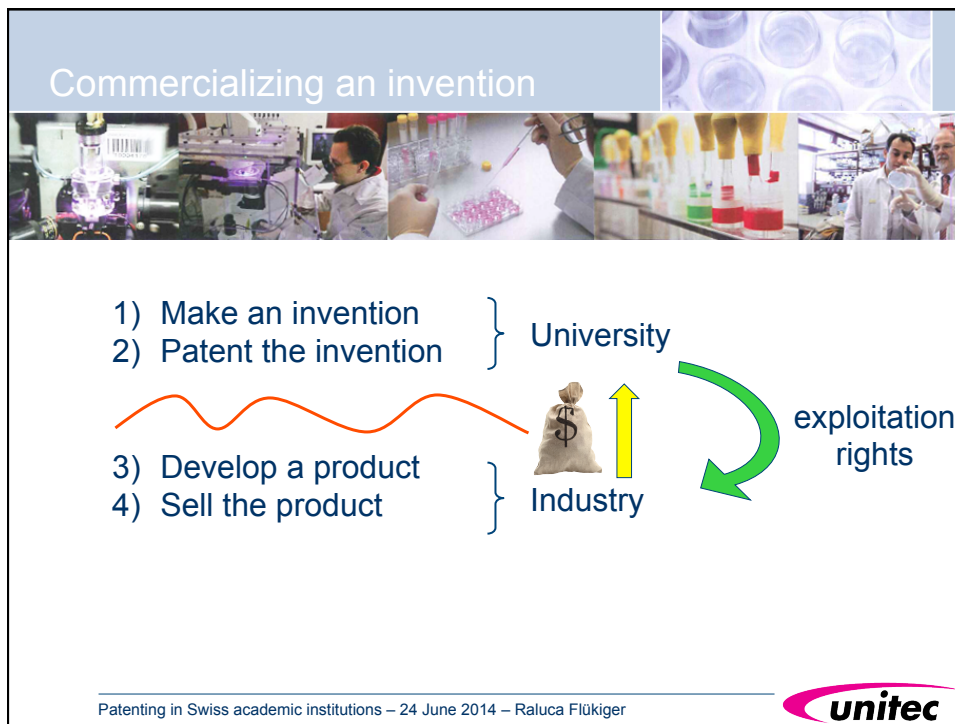
Commercializing an invention



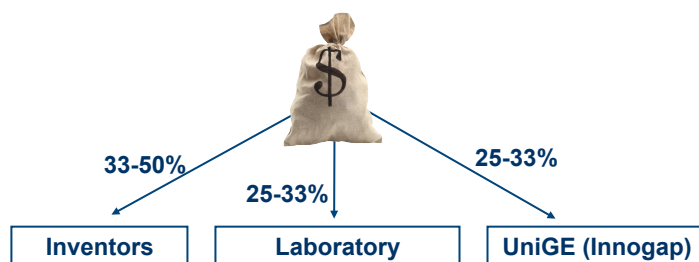
- 1) Make an invention
- 2) Patent the invention
- 3) Develop a product
- 4) Sell the product

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Revenue - licenses



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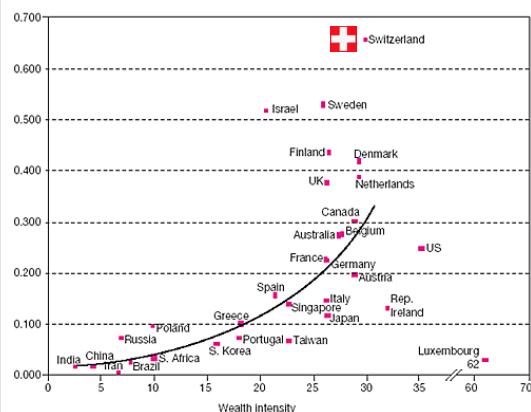
Technology transfer in Swiss academic institutions



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High-impact publications



D.A. King, The scientific impact of nations *Nature* 430, 311 - 316 (2004)

Entre 1999 et 2009		
Rang	Nombre de publications	Indice de qualité (nombre de citations par publication)
1	Suisse 171.248	15,73
2	Etats-Unis 2.974.344	15,02
3	Danemark 92.734	14,77
4	Pays-Bas 236.344	14,47
5	Ecosse 106.559	14,29
6	Grande-Bretagne 682.018	13,78
7	Suède 174.789	13,77
8	Finlande 86.509	12,87
9	Belgique 128.800	12,53
10	Canada 424.562	12,33
11	Allemagne 766.162	12,28
12	Autriche 89.782	11,97
13	Israël 109.410	11,77
14	Norvège 65.306	11,70
15	France 548.046	11,50
16	Pays de Galles 35.592	11,38
17	Australie 276.622	11,09
18	Italie 403.588	10,95
19	Irlande du Nord 17.485	10,87
20	Irlande 39.618	10,52

Essential Science Indicators, Thomson Reuters

Publication Ranking



Chart 4.3.2: Research areas publication ranking

Research area	Ranking		
	1 st	2 nd	3 rd
Life science	Switzerland	United States	United Kingdom
Physical, chemical & earth science	United States	Switzerland	Netherlands
Clinical medicine	Switzerland	Denmark	Belgium
Agriculture, biology & environment science	Switzerland	Sweden	Denmark
Engineering, computing & technology	United States	Denmark	Switzerland

Source: Interpharma, *Le marché du médicament en Suisse*, 2010

Note: Classification made by the degree of consideration of scientific publications from 2002 to 2006

International Comparisons 2010-2011 / www.whylgeneva.ch

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Political message



Excellent research –
more innovation !!!

(Innovation = idea + need + implementation)

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Technology transfer



- ♦ Patents
- ♦ Materials
- ♦ Know-how
- ♦ Collaborations
- ♦ Spin-offs
- ♦ *Consulting*
- ♦ *Diplomas*

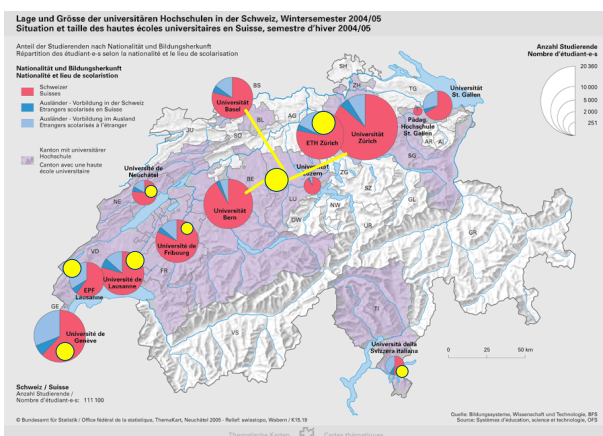
Academia ⇌ Industry

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Virutally no direct investment by the confederation in TTOs



Typical activities of TT offices



- ♦ Assess commercial potential of new technologies
- ♦ Protect intellectual property
- ♦ License material and intellectual property
- ♦ Distribute royalties
- ♦ Negotiate agreements with industry (MTAs, CDAs, collaboration agreements, ...)
- ♦ (Manage proof-of-concept funds)
- ♦ (Coach and support spin-offs)

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www.switt.ch



swiTT 
swiss technology transfer association

Founded in 2003

Currently over 120 members
from over 20 institutions



Swiss innovation



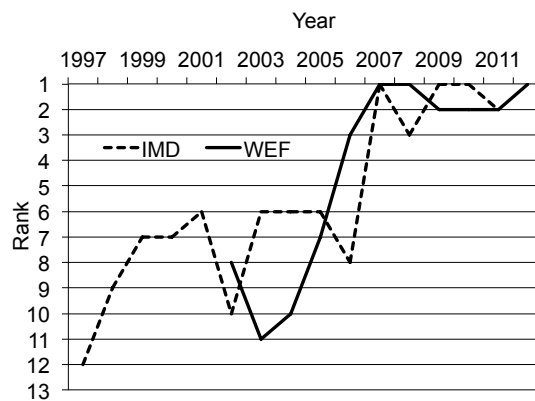
In 2012 (swiTT report 2013):

- 3323 research projects with economic partners
- 519 invention disclosures
- 297 priority patent applications
- 174 new license and option agreements
- 62 start-up companies

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Innovation Ranking



Sources:

World competitiveness yearbook
2011, IMD

Global competitiveness report
2011-2012, WEF

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Patenting and commercializing academic inventions

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Licensing an invention



Invention disclosure



Triage

» IP protection

» Marketing

» Negotiation



License

» Monitoring

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Invention Disclosure



1. Invention ?

2. Inventors ?

3. Ownership ?

4. Publications ?

UNIVERSITÉ DE GENÈVE	unitec
CONFIDENTIEL	UNITEC
<p>Annonce de technologie/invention</p> <p>Tout inventeur issu de la recherche à l'Université de Genève peut être déclaré à l'Unitec.</p> <p>Le but de ce formulaire est de déclarer la technologie/invention et les circonstances dans lesquelles la technologie/invention a été découverte.</p> <p>Ce document sert de base pour décider si il est approprié d'obtenir des droits de propriété intellectuelle de la technologie/invention auprès de personnes externes. Il est également utilisé comme base pour décider de la stratégie de gestion de la technologie.</p> <p>Remarque: ce formulaire, de droit de l'Université de Genève, est soumis à l'Unitec et est soumis à l'Unitec.</p> <p>Unitec Université de Genève CH-1205 Genève Tél: +41 22 379 11 11 Email: unitec@unige.ch</p>	

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Inventors



Case 1:

Professor says he's the sole inventor and the postdoc has had no inventive contribution whatsoever.

Case 2:

All 10 authors of the paper are listed as inventors.

The patent is easily invalidated if the inventors list is incorrect

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Ownership



**CONFEDERATIO HELVETICA**
Les autorités fédérales de la Confédération suisse

Page d'accueil
Courrier
Recherche

[Recueil systématique du droit fédéral](#)
[Table des matières du droit interne](#)
[Page de rendu \(RS 420\) Loi fédérale sur la recherche](#)
[Chapitre 3. Coopération entre les universités de recherche](#)
[Section 4. Dispositions générales concernant les organes de recherche](#)
▶ [Art. 28 Publication et mise en valeur des résultats de la recherche](#)
▶ [Art. 29 Contrôle](#)

[deutsch](#)
[français](#)

Art. 28a¹ Transfert des résultats de recherches

¹ La Confédération peut lier l'octroi d'une aide financière aux conditions suivantes:

- a. la propriété intellectuelle ou la titularité des droits sur les résultats de recherches financées avec cette aide est transférée à l'institution à laquelle le bénéficiaire est rattaché;
- b. l'institution prend les mesures propres à encourager la mise en valeur des résultats, notamment leur exploitation commerciale, et garantit aux inventeurs une part équitable des revenus générés par l'exploitation commerciale des résultats.

² Si l'institution concernée omet d'entreprendre les démarches prévues à l'al. 1, let. b, les inventeurs peuvent exiger d'être réinvestis de la propriété intellectuelle ou de la titularité des droits.

¹ Introduit par le ch. I de la LF du 8 oct. 1999, en vigueur depuis le 1^{er} août 2000 ([RO 2000 1858](#) 1860; [FF 1999 371](#)).

Etat le 25 juillet 2000

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Ownership of IP - University law



University law [extract]:

Art. 15 Propriété intellectuelle

1. A l'exception des droits d'auteur sur les publications, **l'université est titulaire des droits de propriété intellectuelle** portant sur toutes les créations intellectuelles ainsi que les résultats de recherches, y compris les programmes informatiques, obtenus dans l'exercice de leurs fonctions par les personnes ayant une relation de travail avec l'université.

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Ownership



Postdoc with fellowship
Invited professor
Unpaid diploma student
Professor recently moved from other institution

Collaboration/MTA with
another university

Collaboration/MTA
with a company

IP rights might not belong to the institution

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Triage criteria

- Commercialization prospects
- IP situation
- Inventor profile

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Commercialization prospects

What's the product?
Who will use the product?
Is there a market?

Regulatory aspects
Barriers to entry

Revenue

PoC?
Time

Alternative approaches/direct competitors
Acceptance barriers

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Unitec's past experience



Decent chance to license:

Products close to market
Medical devices
Technology platforms
Reagents
Software
Therapeutics (to start-ups)

Difficult to license:

Therapeutic targets
Therapeutic use patents
Screening methods
« Polyvalent » assays
Therapeutics (to pharma)

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Intellectual property situation



♦ Is it necessary to patent?

Novelty
Application
Inventive step

♦ Is it possible to patent?

Scope of claims
Ease of detecting infringement
Dependence on other patents
Market size

♦ Is it worth patenting?

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Novelty – prior disclosures



Case 1:

Submitted a paper – to be published in less than 2 weeks

Case 2:

Presented data at a conference

Novelty might have been compromised

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Novelty – the Cohen/Boyer case



- Stanley Cohen (Stanford University)
Circular DNA (=plasmids) and their implication in bacterial antibiotics resistance
 - Herbert Boyer (University of California)
Proteins involved in bacterial DNA mutations (=restriction enzymes)
- ➔ Invention: how to cut out a piece of DNA, paste it into a plasmid and express it in bacteria (=recombinant DNA)

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Novelty – the Cohen/Boyer case



- 1) Inventors publish article
- 2) Stanford OTL learns about the invention in the *New York Times*.

Disclosure prior to patent filing

Saved by US « grace period »
US licensing revenue: \$300 Mio (\$20Mio per inventor)

Estimated loss: \$300 Mio !!!

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Novelty – prior disclosures



Problematic:

- Publication of scientific article
- Poster
- Printed abstract
- Web site
- Public seminar*

In principle, OK:

- Submission of scientific article
- Grant proposal
- Departmental seminar

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Novelty - patents and publications



Publish or perish ↔ *Publish and perish*

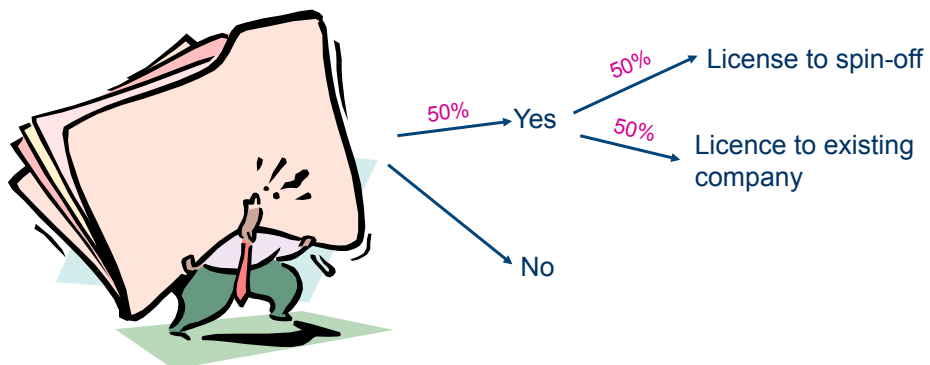
Patenting doesn't mean you can't publish!!!

→ Date of patent filing must be anterior to date of publication

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Triage results



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Claims



Commercial value of patent: claims

Scope too narrow	<i>insufficient protection</i>
Scope too broad	<i>patent rejected during examination</i> <i>patent invalidated post-grant (litigation)</i>

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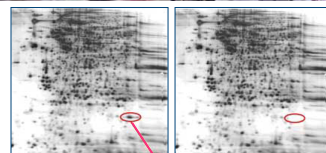


Claims – « prophetic patents »



Experimental result:

Glomerulopathy patient vs control by 2D gel :



MS: HGR57

WHAT IS CLAIMED IS:

1. A method of assessing whether an individual **has or is at risk for developing a renal disorder** comprising the steps of:
 - a) obtaining a **biological sample** from the individual;
 - b) analyzing the sample to determine the presence, absence or amount of one or more biomarkers selected from the group consisting of **HGR57, HFR34, NBP1, LN49, LNBP35, ratatine, aubergine, citadine**; and
 - c) assessing from said **presence, absence or amount** of the one or more biomarkers whether the individual has or is at risk for developing a renal disorder.

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Scope of claims – Celebrex case



Background:

University of Rochester files a patent application for the use of COX-2 inhibitors as an anti-inflammatory drug.

While waiting for the patent to be granted, UR notices that Searle&Co (bought up by Pfizer) is commercializing such an inhibitor under the name Celebrex™ for the treatment of arthritis.

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Scope of claims – Celebrex case



Action:

The day after the patent is granted, UR sues Pfizer for infringement of their patent.

Reaction:

Pfizer holds that UR patent is invalid.

Result:

Pfizer wins and the UR patent is invalidated.

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Patent litigation statistics



Patent suits for almost 100% of productive patents

Patent owner loses in > 50% of infringement suits

Patent owner loses in > 50% invalidation suits

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Patent costs



Typical pharma patent:

40 countries

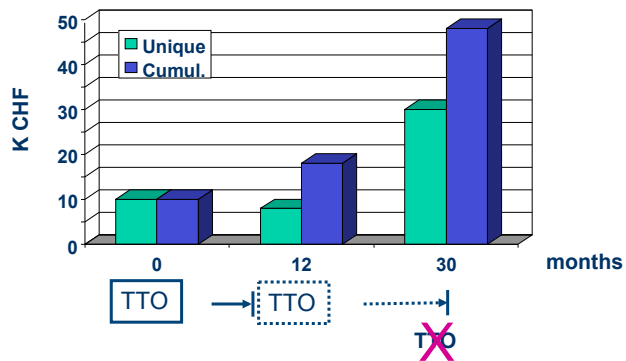
500'000 CHF

+ several million CHF in post-grant litigation

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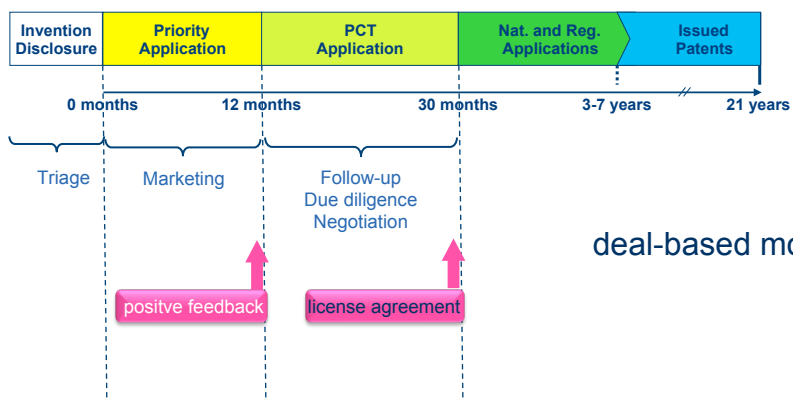
Patent costs



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Timeline for patenting/licensing



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Challenges of academic TT



- ♦ Academic researchers think first about publishing before they think about patenting
- ♦ Technology is most often very early stage
 - difficult to recognize commercial potential
 - perceived as high risk for industrial partner
 - patents hard to defend

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Academic inventions that have “changed the world”



- | | | |
|---------------------------|----------------------------|------------------------------|
| · Saccharin | · Magnetic Core Memory | · Cisplatin |
| · Rocket Fuel | · Cephalosporin C | · Recombinant DNA Technology |
| · Insulin | · Heart-Lung Machine | · Canine Parvovirus Vaccine |
| · Vitamin D Fortification | · Polio Vaccine | · Kennel Cough Vaccine |
| · Concrete Steam Curing | · Fluoride Toothpaste | · Restasis |
| · Plexiglass | · Pacemaker | · Adenocard |
| · Pabulum | · Ultrasound | · Factor IX Gene Product |
| · Electron Microscope | · Warfarin (coumarin) | · LASER Cataract Surgery |
| · Drunk-O-Meter | · Seat Belt | · Allegra |
| · Penicillin | · Carcinoembryonic Antigen | · Synthetic Taxol |
| · Pap Smear | · Gatorade | · Trusopt |
| · Blood Preservation | · LCD | · Emtriva |
| · Ultrasound | · Hepatitis B Vaccine | · Combination PET/CT Scanner |
| · Streptomycin | · MRI Scanner | · CAT Scan |
| | · Electronic Computer | |

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