

Patenting in Swiss academic institutions



11 June 2012 – Raluca Flükiger



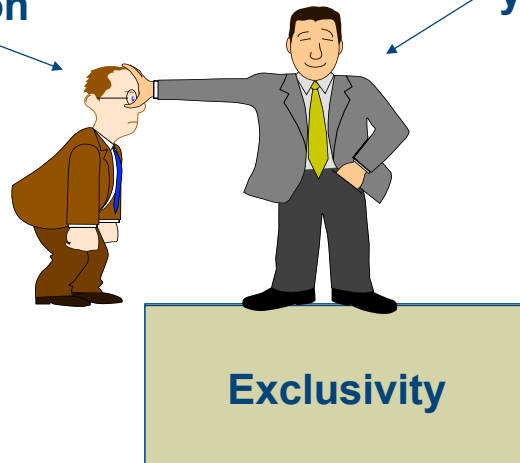
1. Why patent ?
2. Technology transfer in Swiss academic institutions
3. Patenting and commercializing academic inventions

Competition



competition

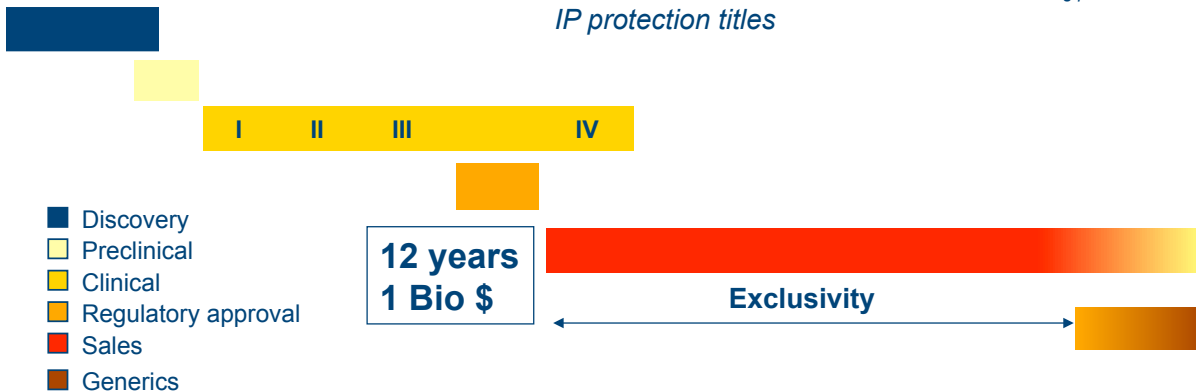
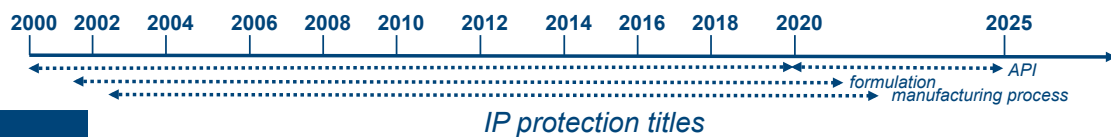
you



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Life of a pharmaceutical product



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Patents



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

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.

Disadvantages of patenting



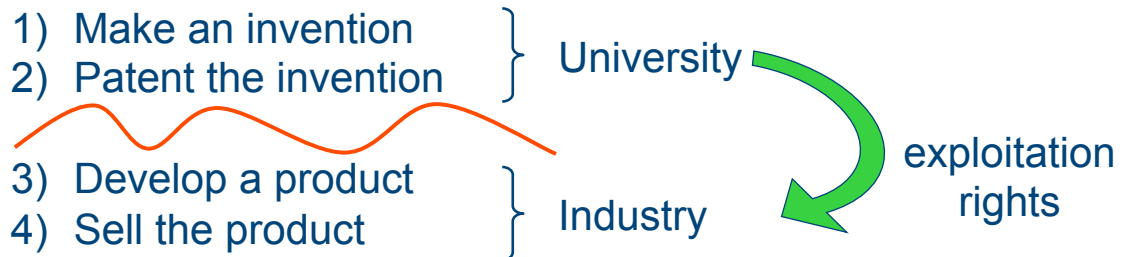
- ♦ Costs
- ♦ Not always easy to enforce
- ♦ Disclosure (information used by competition, risk of infringement...)

Commercializing an invention



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

Commercializing an invention



Transfer of patent rights



Material property



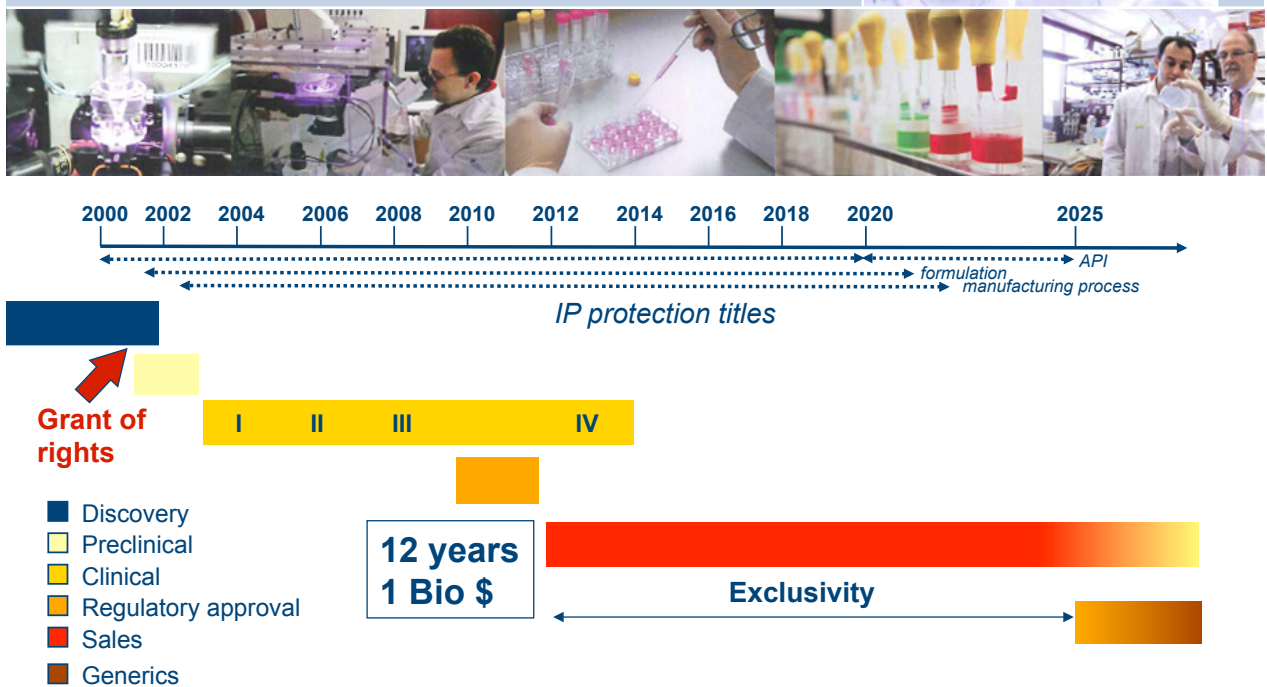
sell
rent

Intellectual property

assign
license



Life of a pharmaceutical product



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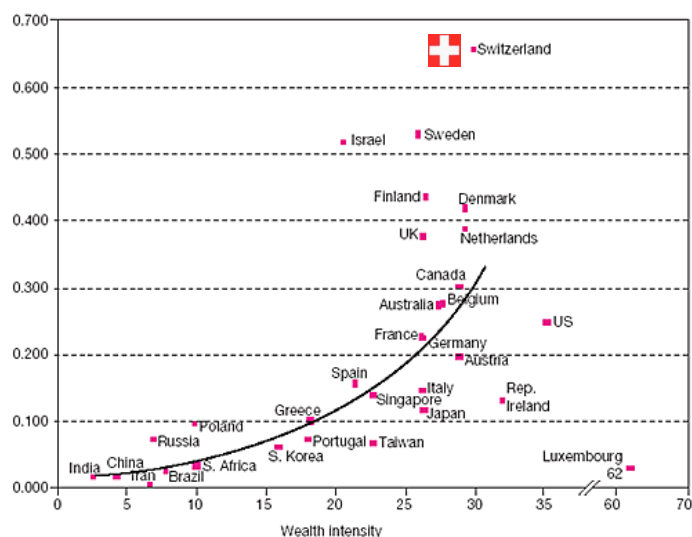


Technology transfer in Swiss academic institutions

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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 marches 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.whygeneva.ch

Political message



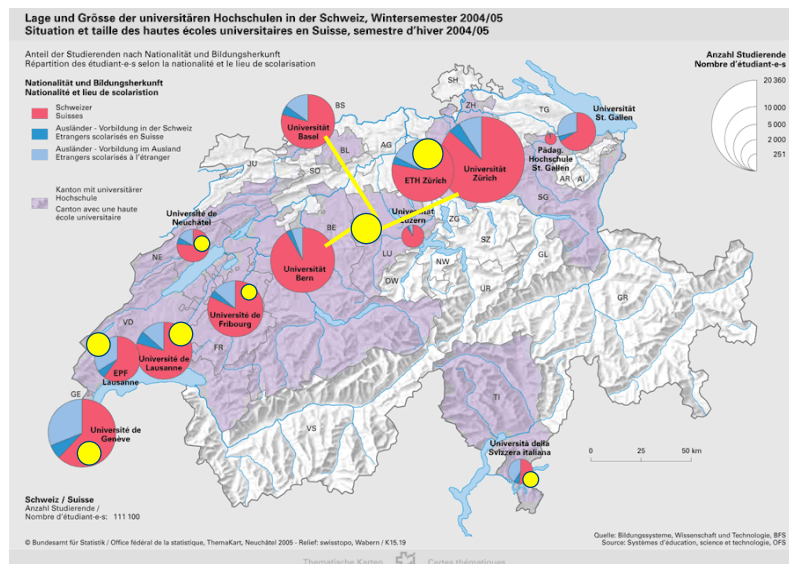
Excellent research –
more innovation !!!

(Innovation = idea + need + implementation)

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Swiss institutions and their TT offices



Virutally no direct
investment by the
confederation in
TTOs

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Typical missions of TT offices



- 1) To maximize the likelihood of converting academic research into useful innovations (through licensing and collaboration).
- 2) To negotiate a fair share of revenues made by third parties through commercialization of products based on University research.
- 3) To support the local economy through the creation of start-ups

Typical activities of TT offices



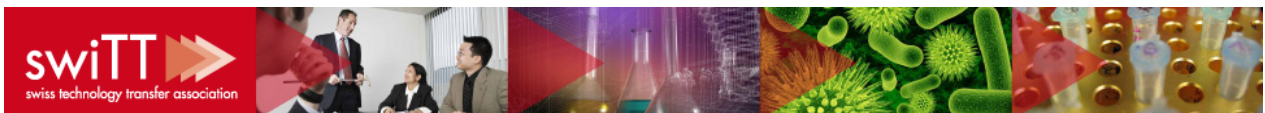
- ♦ Assess commercial potential of new technologies
- ♦ Protect intellectual property
- ♦ License material and intellectual property
- ♦ Distribute royalties
- ♦ Negotiate agreements with industry (MTAs, CDAs, collaboration agreements, ...)
- ♦ (Manage proof-of-concept funds)
- ♦ (Coach and support spin-offs)

www.switt.ch



Founded in 2003

Currently over 120 members
from over 20 institutions



2010 swiTT report



2855 research projects with economic partners

446 invention disclosures

195 priority patent applications

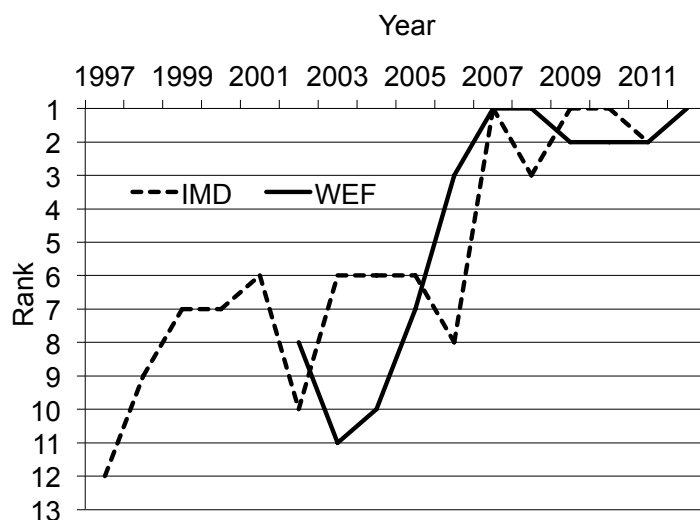
191 new license and option agreements

66 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

Annonce de technologie/invention

Toute invention issue de la recherche à l'Université de Genève doit être déclarée à Unitec.

Le but de ce formulaire est de rapporter la technologie/invention et les circonstances dans lesquelles la technologie/invention a été développée.

Ce document sert de base pour évaluer s'il est opportun d'entamer des démarches de valorisation de la technologie/invention auprès de partenaires industriels. Il est également utilisé comme base pour un éventuel dépôt de demande de brevet.

Merci de remplir le formulaire, de faire signer par toutes les personnes qui ont contribué au développement de la technologie/invention, et l'envoyer à Unitec à l'adresse ci-dessous:

Unitec
Université de Genève
24, rue Calandrin
1211 Genève 4
Tél. 022 379 60 00
E-mail: unitec@unige.ch

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

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 note I RG 420.1 Loi fédérale sur la recherche](#)
[Chapitre 3. Coopération entre les organes 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](#)

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 271](#)).

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

Triage criteria



- Commercialization prospects
- IP situation
- Inventor profile

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

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

♦ Is it worth patenting?

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

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)

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 !!!

NB: grace period will disappear altogether in March 2013

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

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

Unitec's past experience



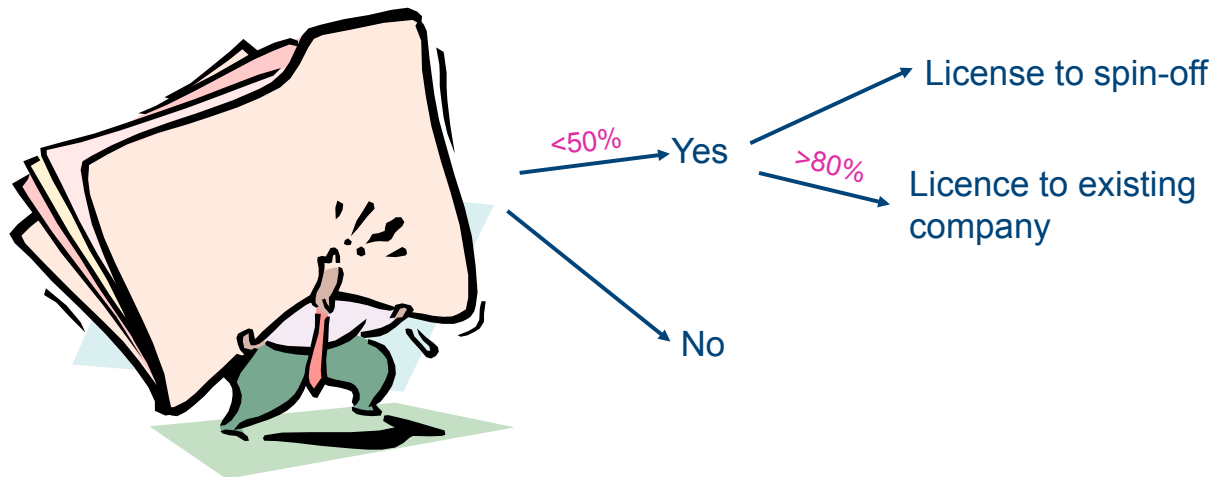
Decent chance to license:

- Products close to market
- Medical devices
- Technology platforms
- Reagents
- Software

Difficult to license:

- Therapeutic targets
- Therapeutic use patents
- Screening methods
- « Polyvalent » assays

Triage results



Claims



Commercial value of patent: claims

Scope of the claims
as broad as possible

(even if no data to support them... = « prophetic patents »)

Claims – « prophetic patents »



Experimental result:

Glomerulopathy patients have increased expression of HGR57 in urine

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.

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.

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.

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

Scope of claims



Scope often restricted during examination procedure

Litigation dangerous if scope is too broad

Patent costs



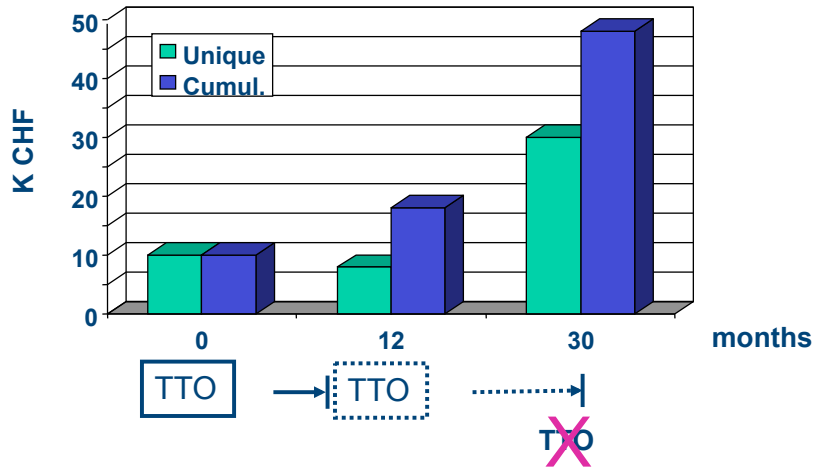
Typical pharma patent:

40 countries

500'000 CHF

+ several million CHF in post-grant litigation

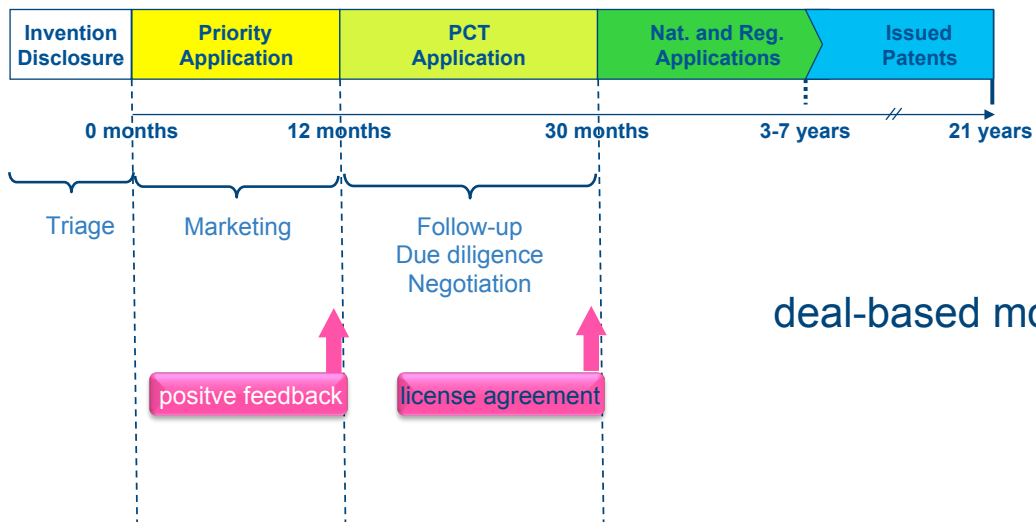
Patent costs



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Timeline for patenting/licensing



deal-based model

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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

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 | · Our claim to fame |



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