

R E G I S T E R N O W !

1,000,000,000 CHF investment

7,000,874 hours of work

6,587 experiments

423 researchers

1 medicine



THE MAKING OF AN INNOVATIVE MEDICINE

*Introductory workshops on translational biomedical research,
drug discovery and development*



Judge Prof Dr med Olaia Naveiras

**BIO-698 resumes Thursday September 11. 2025
4:15 PM @ CM013**



With Timothee Ferrari MD PhD cand



Sciences de la Vie -SV



With Justine Epiney MD PhD cand



Mehdi AliGadiri MD PhD cand



Prof Roger G. Clerc

The Making Of An Innovative Medicine – class schedule

Thursday's @ 4-6 PM except 04.12/11.12.25 @2-6 PM



- Session 1: Scope of the course _ general organization _ case study**
11.09.25 *Embracing a career at the heart of biomedical research !?*
CM013
- Session 2: Historical perspective: the modern pharmacy**
18.09.25 *Advent of modern medicines - placebo controlled drug development*
CM013
- Session 3: Introduction to translational research: crossing the bridge**
25.09.25 *A chasm has opened wide between biomedical research and patients in need*
CM013
- Sessions 4-5: Therapeutic target identification I & II**
02-09.10.25 *“me too” vs a wealth of innovative targets _ small MW cpds vs biologicals*
CM013
Early front loading of biomarker identification for cohort stratification
- Session 6: Structure based drug design _ medicinal chemistry_low/high throughput screening assays_ multiple parallel optimization_ML-powered screens**
16.10.25 *Setting up screening assays, the robotics, the million cpds libraries*
CM013
- Session 7: Therapeutic modalities biologicals–peptides : today’s - tomorrow’s pharmacy NBEs**
30.10.25 *Challenges (cost of goods - healthcare payers) and opportunities*
CM013

The Making Of An Innovative Medicine - class schedule

Thursday's @ 4-6 PM except 04.12/11.12.25 @2-6 PM



Session 8: Personalized Healthcare PHC _ precision medicine

06.11.25 *How PHC started: from a single case to a paradigm change*

CM013

Session 9: Pharmacogenetic polymorphisms, Pharmacogenomics

13.11.25 *Interindividual variability toxicity in response to medicines*

CM013

Session 10: In vivo pharmacology, investigative toxicology with Nathalie Brandenberg PhD eMBA CEO

20.11.25 *Preclinical research ends up with IDB's, FDA guidelines for FIH*

CM013

Doppl Ltd

Session 11: Clinical research phase 0 phase I II III IV with Raphael Sommer PhD Bristol Myers Squibb

27.11.25 *The long and complex experimental procedures with human patients*

CM013

Intellectual property_ integrity in research_my genome vs our genomes

Why are patents essential to new medicine/biotech development

Session 12: Health Hackathon – Hacking medicine I with Mr. Enan & Mr. Ali Gadiri MD PhDs confirmed !

04.12.25 *Pitches –building teams – hacking problem - 5Ws – brainstorm*

starts @ 2PM ! CO017

Session 13: Health Hackathon – Hacking medicine II with judges Prof Olaia Naveiras - Prof James Habib

11.12.25 *Building up solutions – make it better - final presentations*

starts @ 2PM ! CO017

WORKSHOP LISTING - THE MAKING OF AN INNOVATIVE MEDICINE BIO 698-HS2025 in CM013

! NON EXHAUSTIVE LISTING - SUGGESTIONS WELCOME !

sessions	workshops	speaker/s
S02 (18-09-25)		
historical medicines	penicilin: impact, whose invention ?	
hopping on giant shoulders	prozac at the core of psychiatry	
	vaccine discovery:smallpox Jenner Today mRNA vaccine	Eugenio
	artemisinin and malaria	
	insulin-Banting Best et al. beagle dog	
	slide51-X-ray image DNA--Rosalind Franklin	
	cyclosporin from soil sample to life saver	
S03 (25-09-25)		
translational research	expanding scope of translational therapies	
from bench to bedside and back	chronotherapy,circadian clock,sex,longevity	Solomon
	CAR-T, TCR-T cell therapies in "cold" tumors	
	Y chrom loss in immune cells drives cancer	
S04 (02-10-25)		
therapeutic target identification	th. target identification using a phenocopy screen	Justine
S05 (09-10-25)		
therapeutic target identification	nocosomial inf/MRSA/phage antibacterials	
	Crispr/Cas9 gene editing huntington disease	
	AI in drug discovery / ML-powered medicine	Lou
	AIDS - Lenacapavir : end of plague ?	
S06 (16-10-25)		
structure based drug design	macrocycles and non druggable targets	Benedikt
	chemoproteomics - NMEs	
	AIDS HIV from deadly virus to chronic disease	
S07 (30-10-25)		
therapeutic modalities - NBEs	rare diseases repurposing medicines	Jana
	biologics on the rise-MABs medicines & more	Eleni
	RNA therapeutics, antisense medicines	
	Wnt pathway - PROTACs vs molecular GLUEs	
S08 (06-11-25)		
PHC personalized healthcare	BRCA1/2 preventive surgery/tumor board	
Human genomics	4P medicine-GWAS-Personalized Health Care	Frederico
	disease enabling biomarkers/micro RNAs	
	AZ-biomarker BD-tau yet still no curative drug	
	centenarian host isoallo-LCA bile acid bacteria	
S09 (13-11-25)		
pharmacogenetic polymorphism	Pharmacogenomics	Greta
	deCODE Inc pharmgenomic/iceland genealogy	
	ageing and thanatophobia	
S10 (20-11-25)		
in vivo pharmacology	guest speaker : profiling MABs on organoids	Nathalie B
toxicology	organoids-drug discovery - CF patients	Tianhao + Alice
	thalidomide repurposing multiple myeloma	
S11 (27-11-25)		
clinical research	SMA gene therapy - pay for performance	
	most common genetic defect : cystic fibrosis	
	guest speaker: profiling biologics in clinical research	Raphael S
	guest speaker profiling cell therapies	
	gender medicine comes of age ?	
S11 (27-11-25)		
intellectual property/integrity	23andMe - my genome	
	biopatents - biosimilars	
	SMA gene therapy - pay for performance	
	emerging biomarkers_liquid biopsies cfDNA miRNAs	Saeed
S12 (04-12-25) starts @ 2PM	Hacking medicine	all + invitees
S13 (11-12-25) start @ 2 PM	Hacking medicine	all + invitees



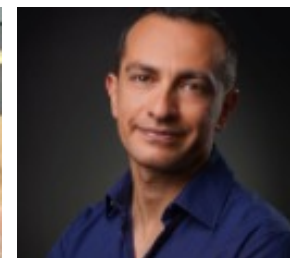
Workshops

The Making Of An Innovative Medicine

(today's class)



Prof O Naveiras



Prof J Habib



- Intellectual property_patents
- Scientific integrity



Intellectual property (IP) _ why patents ?



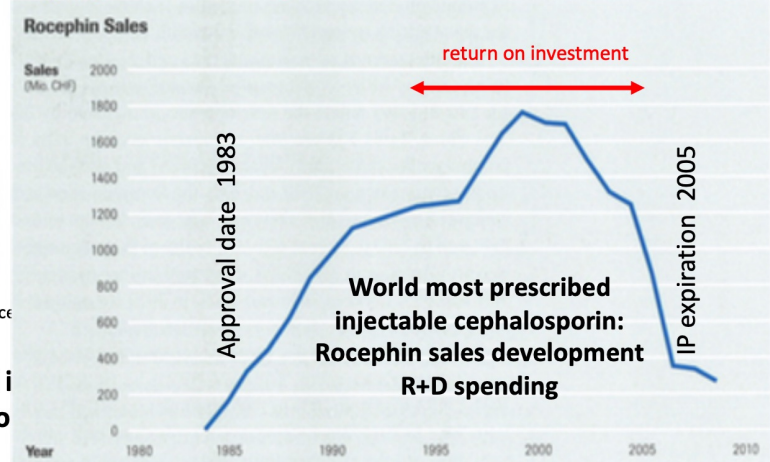
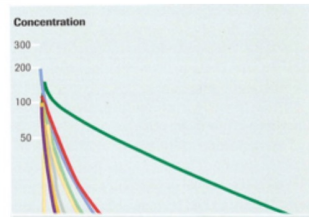
Before AMR and antibiotics stewardship : the big pharma business model



No IP protection, yet unrivalled !
red colour enough ?



Ceftriaxone (green) PK profile (vs other ce...



World most prescribed i
Rocephin sales develo

No IP protection, no new antimicrobial discovery !

- Patenting is important to protect the large investment and assets of a pharma/start up company. Without patent, likely no pharma, no start up R+D, hence no innovative therapeutic solutions for patients in need.
- A patent is a legal right granted on an invention, something new, prior art, not state-of-the-art, being it pharmaceutical, object, process or use.



**NOW THAT YOU HAVE WORKED FOR >10 YEARS
ON AN INNOVATIVE MEDICINE !**

**HOW TO MAKE SURE SOMEBODY ELSE DOES NOT PRODUCE A
COPYCAT VERSION OF YOUR DISCOVERY ?**

WHY PATENTS ARE IMPORTANT IN PHARMA ?

- **Patenting is important to protect the large investment and assets of a pharma/start up company. Without patent , likely no pharma R+D hence no innovative therapeutic solutions for patients in need**
- **A patent is a legal right granted on an invention, something new, prior art, not state-of-the-art, beeing it pharmaceutical, object, process or use**
- **Systems Biology, O‘mics, Molecular Biology, Computational Biology et al. have revolutionized medical practice by making of an innovative medicine possible : intellectual property is key !**

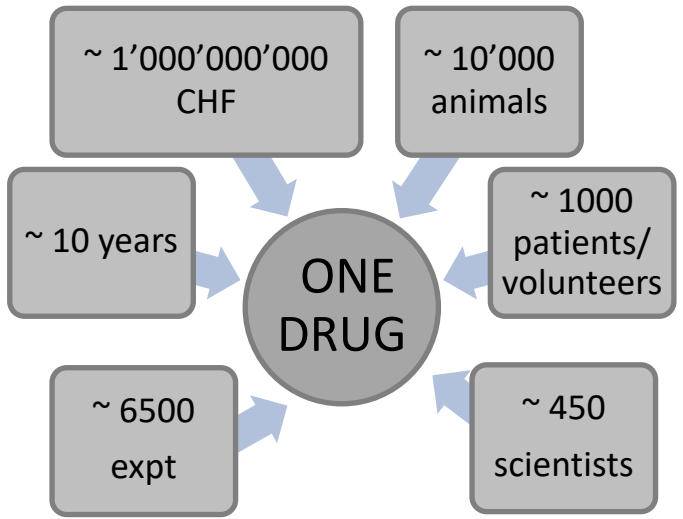
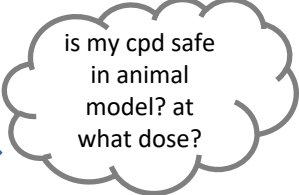
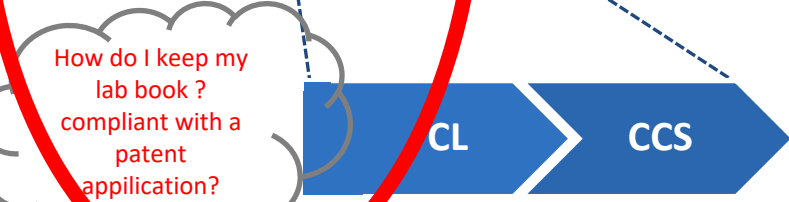
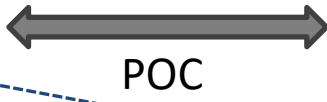
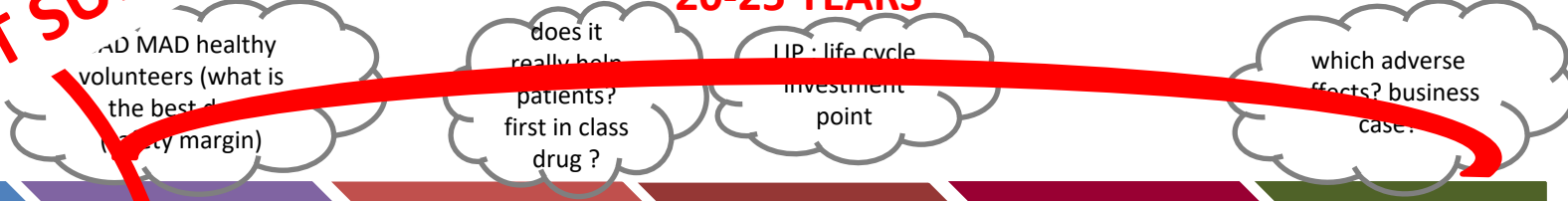


The V...

Patent submission from **Day 1 of your discovery** _ **PRIOR ART IS KEY !!**

20-25 YEARS

PATENT SUBMISSION



The Making Of An Innovative Medicine:
From Idea to Medicine

Life cycle of an innovative medicine – FIRST BRAND THEN GENERIC

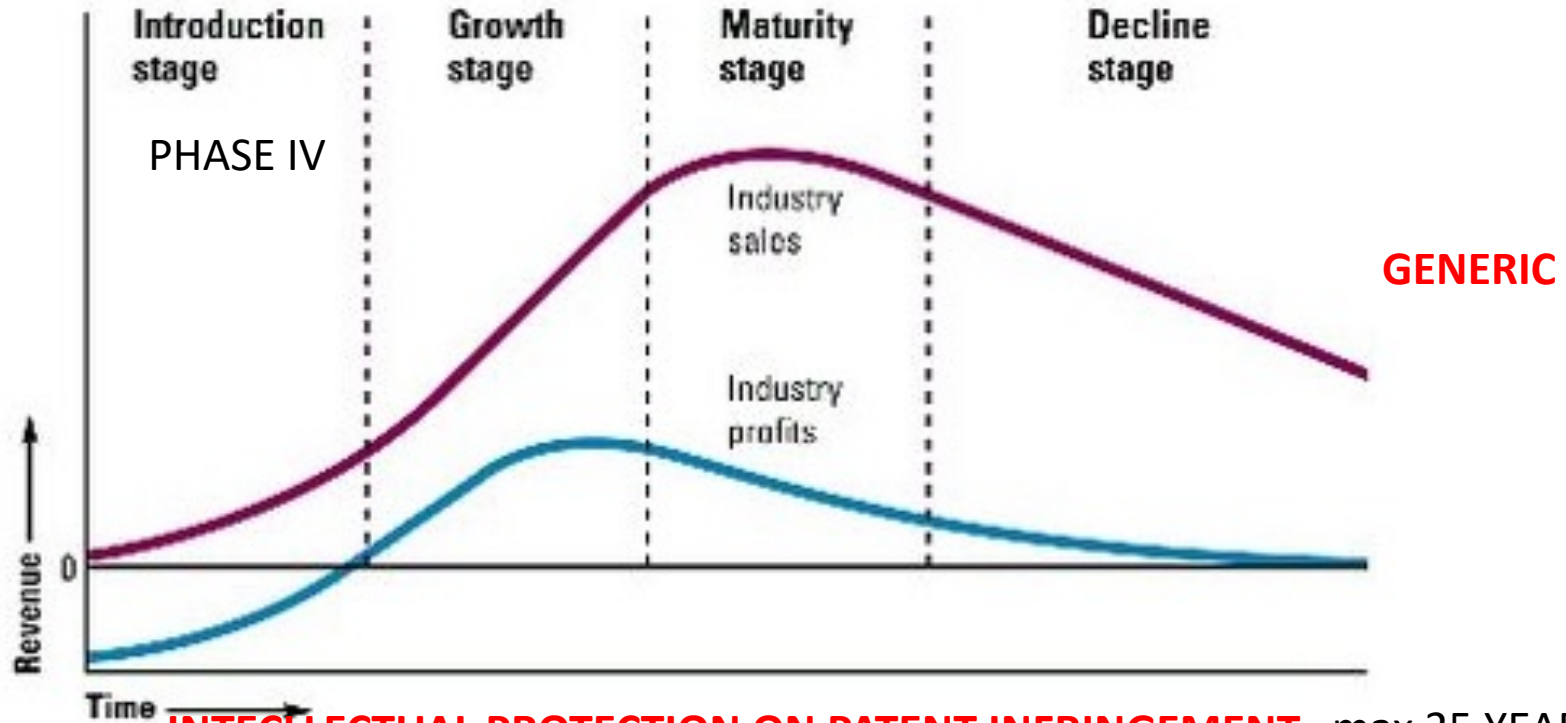


PATENT
SUBMISSION
DAY 1 OF
DISCOVERY

Product life cycle

BRAND

MEDICINE SURVEILLANCE FOR ADVERSE EFFECTS



FDA APPROVAL
DAY 1 MARKET

GENERIC DRUGS ARE MUCH CHEAPER,
BUT SOME CALL FOR CAUTION

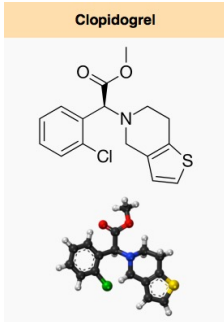


Intellectual property (IP) _ patent infringement



the brand

WHY PATENTS ARE IMPORTANT IN PHARMA ? HOW SERIOUS CAN INFRINGEMENT BE ?



- Sanofi-Aventis and Bristol Meyers Squibb awarded 442 millions US \$ by supreme court in Manhattan in damages from Apotex (largest canadian generics company) for Plavix (blood thinner) patent infringement



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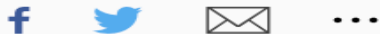
Sign In

Star Business Journal

Apotex must pay \$442.2 million in Plavix case

the copycat (generic)

Tues., Oct. 19, 2010

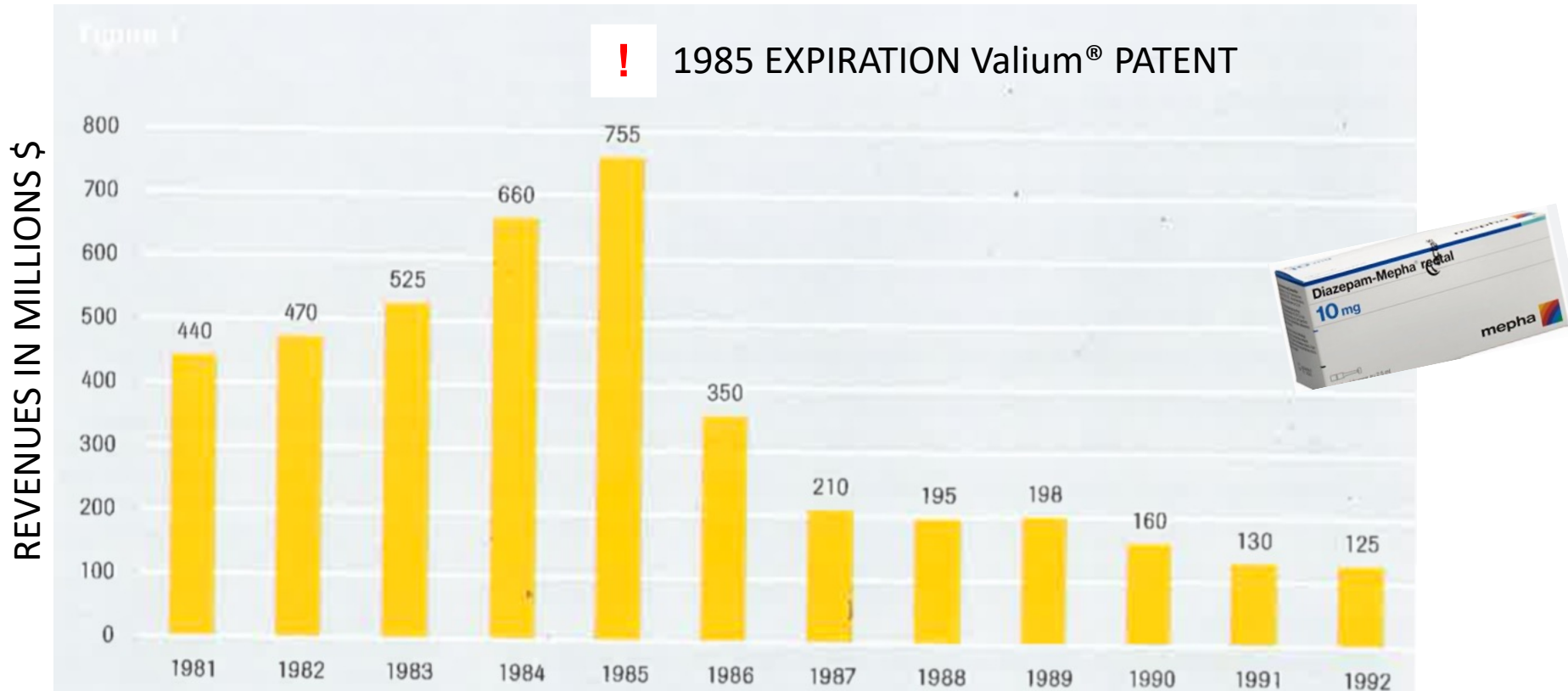


Toronto-based Apotex Inc. must pay Sanofi-Aventis SA and Bristol-Myers Squibb Co. \$442.2 million (U.S.) for making a copy of the drug Plavix, a Manhattan court has ruled.





WHY PATENTS ARE IMPORTANT IN PHARMA ?



Diazepam (Valium®) was patent filed in 1960, FDA approved in 1963 by Roche Ltd (10y after chlordiazepoxid first less potent benzodiazepine Librium). Later diazepam approved as rectal gel formulation for cluster seizures in 1990's as nasal spray formulation

Note : Diazepam is still in clinical use, prior to surgical procedures or other alcoholic dependence etc

LIFESAVER MEDICINES FOR MILLIONS AND INTELLECTUAL PROTECTION : eg. BENZODIAZEPINE VALIUM®



February 24, 1985

GLORY DAYS END FOR PHARMACEUTICALS

By WINSTON WILLIAMS

LAST month, the privately held Swiss drug company, Hoffmann-LaRoche, dealt a harsh blow to its American work force: Disappointed by the flow of new products here and preparing for the imminent expiration of its lucrative patent on Valium, the company said it would lay off 1,000 employees, more than 12 percent of its American payroll.

Source: [The New York Times \(24.2.1985\)](#)

- Patent expiry occurs 20 years and maximal 5 years extension after patent date
- Upon expiry drug sales dramatically drop, generics are taking over the market
- **Commercial aspects of patent expiry and its consequences are not to underestimate : many examples such as Versed Inc sales dropped from 626 M\$ to 19M\$ (97% sales losses) within a few years in the context of thousands of jobs loss**



Novartis streamlines

Plant closures and job losses as patent expiries loom

Novartis is to close three plants in Italy and Switzerland and restructure business in the US resulting in the loss of 2000 jobs over the next three-to-five years.

The Switzerland-based pharmaceutical company said 700 new positions would be created in low-cost countries, with expected annual savings of \$200m.

In a video discussing the company's financial results for the third quarter of 2011, Joseph Jimenez, CEO at Novartis, blamed the cost-cutting measures on an "increasingly difficult environment" that was likely to get even tougher over the next five years.

He said: "These actions are necessary to ensure that we adapt our organisation to continue delivering on our mission of bringing innovative new drugs to patients."

Earlier in 2011, Novartis announced the loss of 550 jobs at its plant in the UK, and in December 2010 around 1,400 sales reps were laid off in the US.

The cuts come despite an increase in net profit of 16 per cent (at constant

exchange rates) for the Q3 period, with Novartis making \$3.54bn.

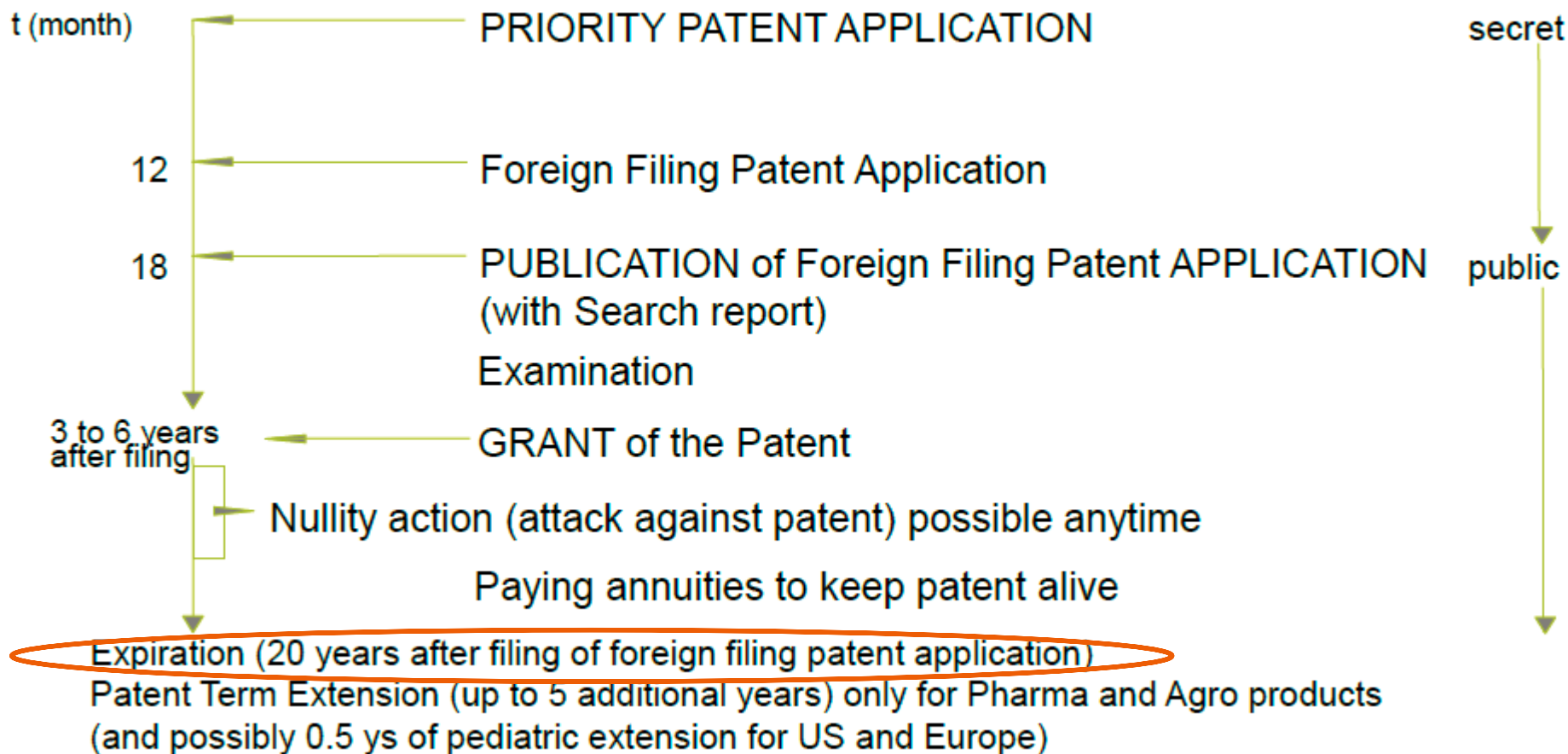
Revenue was up too, increasing by 12 per cent to \$14.84bn for the third quarter of 2011.

However, the company is facing pressures from a strong Swiss franc, and upcoming patent expiries for key drugs. These include blood pressure treatment Diovan (valsartan), which is already feeling the effects of generic competition as patent protection is lost in stages over the next two years. Sales of the drug fell by 7 per cent to \$1.43bn during the quarter.

In its outlook for the rest of 2011, Novartis said it expected to deliver sales growth in the low- to mid-single digits, with volume growth more than offsetting the impact of generic competition and price pressures.

Sales from its Alcon eyecare division, purchased in October 2010, were expected to increase at a mid to high single-digit rate, while generics division Sandoz was projected to deliver high single-digit sales growth.

Intellectual property _ the milestones of patent life





Vaccines free of charge ?

Global health policies (eg COVAX) vs pharma patent

Medicine pricing ? How to price life saving drugs ?

Intellectual property and health policies

**How would you defend your inventorship while inventing
new medicines, vaccines ?**

<http://patft.uspto.gov/>

Gleevec/Glivec - Imatinib : patent erosion vs generic versions



Imatinib (a tyrosine kinase bcl-Abl inhibitor) GLIVEC AS AN EXAMPLARY “HALL OF FAME” OF RARE DISEASE INNOVATIVE MEDICINE DISCOVERY **THAT EMERGED AS A BROADER SPECTRUM CANCER MEDICINE**

ONCOLOGY BUSINESS UNIT

	Q4 2016		Q4 2015		FY 2016		FY 2015	
	USD m	USD m	USD	cc	USD m	USD m	USD	cc
<i>Gleevec/Glivec</i>	764	1 219	-37	-36	3 323	4 658	-29	-28
<i>Tasigna</i>	458	432	6	9	1 739	1 632	7	10
Subtotal Bcr-Abl portfolio	1 222	1 651	-26	-24	5 062	6 290	-20	-18
<i>Sandostatin</i>	408	413	-1	1	1 646	1 630	1	3
<i>Afinitor/Votubia</i>	391	382	2	3	1 516	1 607	-6	-5
<i>Exjade/Jadenu</i>	237	248	-4	-3	956	917	4	6
<i>Votrient</i>	192	176	9	10	729	565	nm	nm
<i>Tafinlar + Mekinist¹</i>	178	147	21	24	672	453	nm	nm
<i>Promacta/Revolade</i>	178	133	34	35	635	402	nm	nm
<i>Jakavi</i>	162	119	36	40	581	410	42	45
<i>Zykadia</i>	22	24	-8	-11	91	79	15	14
Other	217	226	-4	-1	902	951	-5	-3
Total Oncology Business Unit	3 207	3 519	-9	-7	12 790	13 304	-4	-2

¹ Majority of sales for *Mekinist* and *Tafinlar* are combination, but both can be used as a monotherapy
nm = not meaningful

Our Bcr-Abl portfolio, consisting of *Tasigna* and *Gleevec/Glivec*, generated sales of USD 1.2 billion (-24% cc) in the fourth quarter.

Tasigna (USD 458 million, +9% cc) showed solid growth in the fourth quarter across key markets globally. *Tasigna* is approved for the treatment of adult patients newly diagnosed with Philadelphia chromosome-positive (Ph+) chronic myeloid leukemia (CML) in the chronic phase, and is also approved for the treatment of adult patients with Philadelphia chromosome-positive (Ph+) CML in the chronic phase or accelerated phase who are resistant or intolerant to at least one prior therapy including *Gleevec/Glivec*.

Gleevec/Glivec (USD 764 million, -36% cc) declined, driven by the US, where multiple generic versions have entered the market. *Gleevec/Glivec* is approved in more than 110 countries for the treatment of adult patients in all phases of Ph+ CML, for the treatment of patients with KIT (CD117)-positive gastrointestinal tumors (KIT+ GIST), which cannot be surgically removed and/or have metastasized, and for the treatment of adult patients following complete surgical removal of KIT+ GIST. No other indications are available in every country.



Glivec fast FDA approval 2001

- FDA approved 2001
- Patent expires 2015 ; 14 years !!
- Out of 25 potential years IP protection (invention 1990 !)
- **Invention day is key !!**
- Pharma business strategies !
- Line extension !
- Back up molecules !
- Generic for image

Biologicals – patent trial pending 2024 with far reaching impact on NBE’s the case of PCSK9, Amgen’s blockbuster «cash cow” in metabolic diseases



starts to count carbon-footprint assessments, this will take years,” he says. “As soon as you have a few carbon-footprint assessments here and there in different countries or different infrastructures, you start to have a pretty good idea of what you need to do.”

One way to push things forward would be for institutions to ask scientists for emissions-reduction strategies as a condition of grants or jobs. But this is challenging for research institutions that are not used to

considering their emissions, says Knud Jahnel, a cosmologist at the Max Planck Institute for Astronomy in Heidelberg, Germany. “It’s fundamentally human and fundamentally challenging for big organizations because if you’re big, they’re well-oiled in the way they’re used to operate.”

1. Qin, Y. et al. *Nature Genet.* **54**, 134–142 (2022).
2. Martin, P. et al. *Nature Astron.* **6**, 1219–1222 (2022).
3. Adhead, F. et al. *Lancet* **398**, 281–282 (2021).
4. Subaiya, S., Hogg, E. & Roberts, I. *Trials* **12**, 31 (2011).

PATENT ROW COULD HAVE FAR-REACHING IMPACT ON BIOTECH

The results of a US case on therapeutic antibodies could dictate how broad patents are.

By Heidi Ledford

An unusual patent case before the US Supreme Court could have wide-ranging implications for drug prices and technology.

On 27 March, the court heard arguments in a dispute over rights to antibodies that are used to treat high cholesterol in people at risk of cardiovascular disease. Although the court’s justices spent much of their time wrestling with the details of how these therapeutic antibodies are isolated, their decision – expected by the end of June – could affect how specific patents, of any ilk, must be when they describe an invention, and how broad they can be.

“It could spill over into all types of biotechnology cases,” says Sean Tu, a legal scholar at West Virginia University in Morgantown. “Today we’re talking about antibodies, tomorrow we might be talking about CRISPR or CAR-T-cell therapies.”

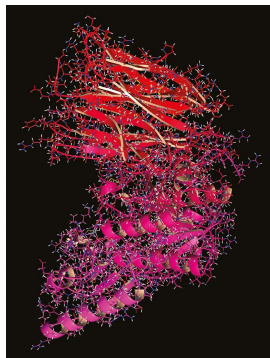
Cholesterol clearance

At the core of the current case are antibodies that bind to a protein called PCSK9, which decreases the clearance of ‘bad’ cholesterol from the blood. The antibodies block PCSK9 activity, resulting in lower levels of this cholesterol. Several PCSK9 antibody therapies have come to market, including Repatha (evolocumab) made by Amgen in Thousand Oaks, California, that was approved in August 2015.

In the case before the US Supreme Court, Amgen is appealing against a federal court ruling that struck down one of its key patents on Repatha. The patent claims not only a handful of specific antibodies, as defined by

an amino-acid sequence, but also any other antibodies, regardless of their structure, that bind to the same region of the PCSK9 protein.

This, said the lower court, was insufficiently detailed. US law requires that a patent contain a written description of the invention that provides enough detail for someone “skilled in the art” to use the patent as a recipe to recreate the invention. But Amgen’s patent, the federal court argued, merely disclosed how to sift through antibodies found in mouse serum for those that bind to a region of the PCSK9 protein, rather than first specifying what the sequence of those antibodies would be.



The PCSK9 protein is the target of antibodies that are used to treat high cholesterol.

A win by Amgen could hinder the development of new medicines by restricting competition and discouraging the development of multiple antibodies that bind to the same target, says Gregory Winter, a molecular biologist at the University of Cambridge, UK. The availability of different antibodies helps to keep the price of antibodies in check, and to provide treatment options for people who develop an immune response to a particular drug.

In 2018, Winter shared the Nobel Prize in Chemistry for his work on therapeutic antibodies. When a colleague showed him the Supreme Court case, he decided to submit a brief to the court explaining the underlying science. In the brief, Winter and his co-authors compare antibodies to an attempt to make calorie-free ice cream. Amgen, they said, made vanilla and chocolate ice cream that it determined, after the fact, to contain no calories. “But rather than patent only those two flavors, Amgen claims to have invented all calorie-free frozen dessert, be it ice cream, sorbet, sherbet, or gelato,” they wrote.

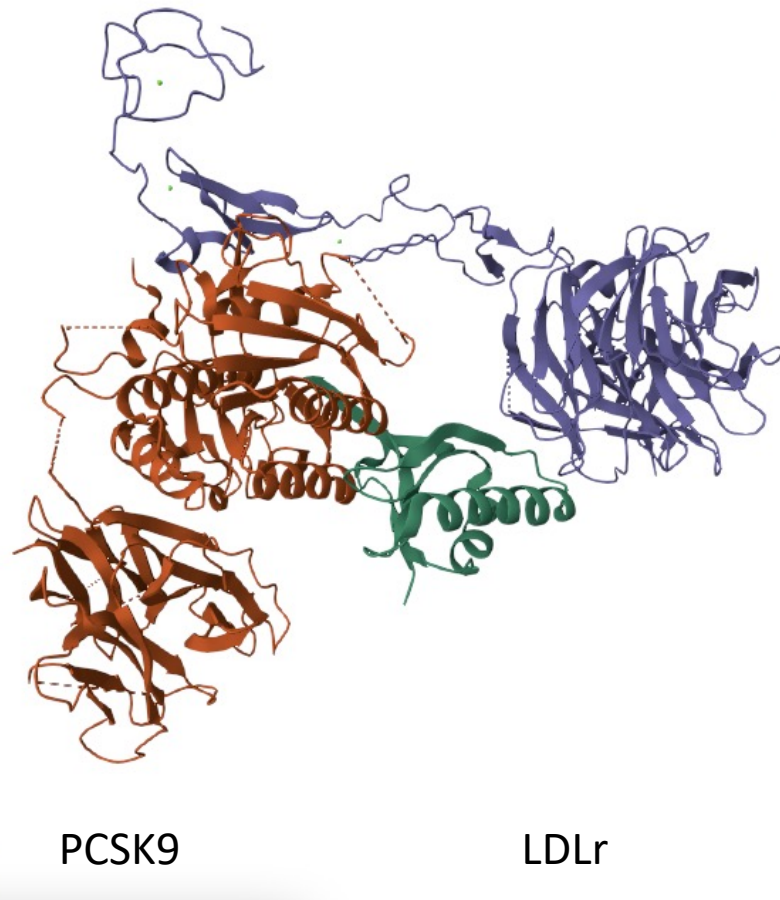
Amgen’s attorneys have argued that striking down its patent will harm future development of therapeutic antibodies. Broad patent protection is necessary to justify the company’s investment in a specific medicine, said attorney Gregory Lamken, who represented Amgen in the Supreme Court. “You can’t invest \$2.6 billion in the breadth of your claims is such that it means you can’t get adequate protection.”

Patents ‘squeezed’

A decision against Amgen could discourage investors from taking a risk on other biotechnology companies as well, said Michael Penn, vice-president of intellectual property at Instil Bio, a company that is developing cell therapies in Dallas, Texas, at a meeting hosted by the American University Washington College of Law in Washington DC after oral arguments. “When they see patents getting squeezed and patent breadth getting squeezed year for year, that investment goes elsewhere,” he said.

The debate divides the industry into those that focus on drug targets, and favour broad patent protection, and those that develop specific molecules against the targets, says Ulrich Storz, an attorney at the Michalski Hütterman and Partner law firm in Düsseldorf, Germany. Universities are more likely to patent targets than candidate drugs, and the Association of University Technology Managers in Washington DC has filed a brief supporting Amgen.

Even so, there is little evidence that the prevailing practice – which over the past few years has favoured relatively narrow patent claims on antibodies – needs to change to allow such broad patents, says Tu, especially given the potential effect on drug prices and treatment options. “The system that we have right now is working pretty well,” he says. “Everybody’s getting paid.”

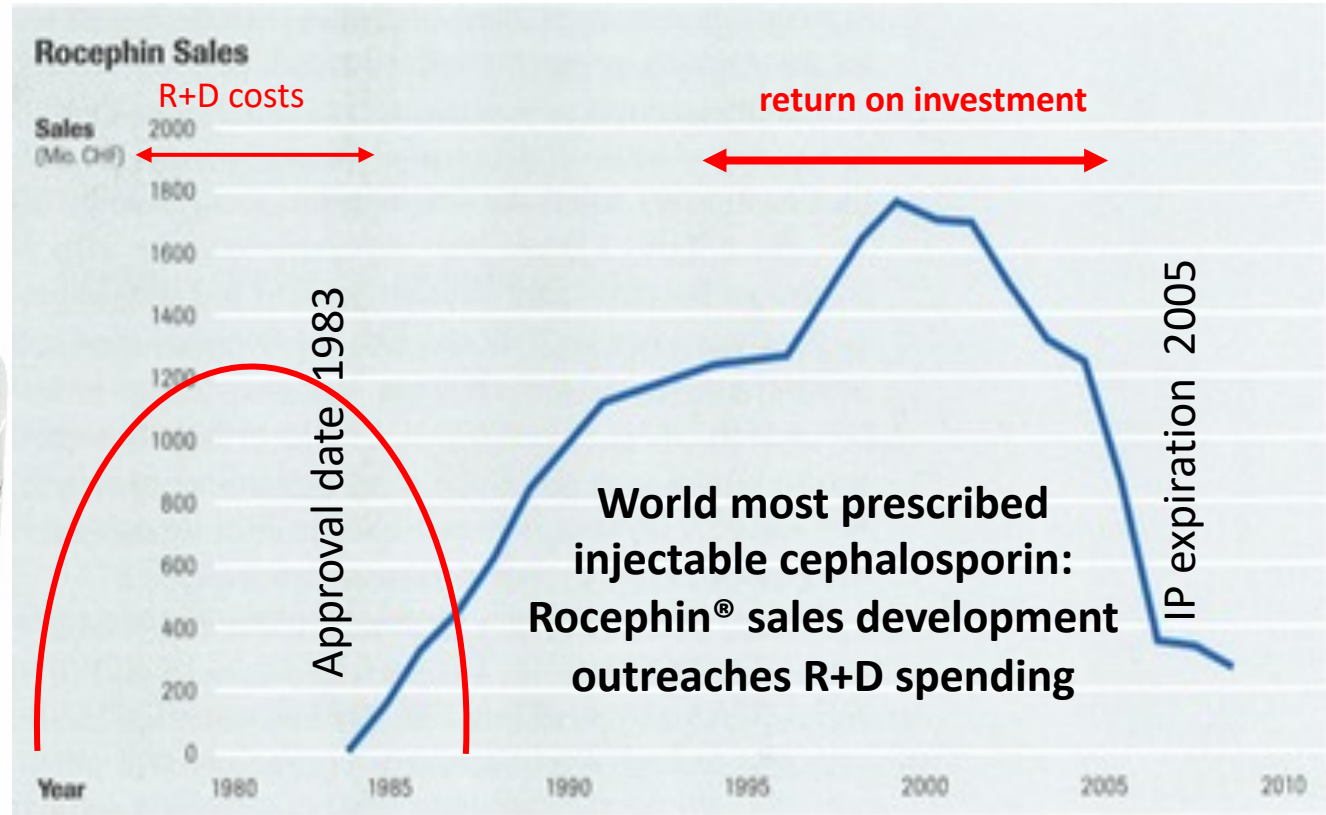


PCSK9

LDLr

Do you file MABs or any biologics patents on AA sequences or on binding properties/activities? Far reaching patent protection issues for Supreme court trials

«Business Life and Death» of a live saving medicine from Roche - ceftriaxone : the pharma business model



World most prescribed injectable cephalosporin:
Rocephin® sales development & R+D spending



No patent protection means essential medicine shortage in EU : the pharma business model needs to change



Suisse: plus de 900
médicaments en rupture
d'approvisionnement
January 2023



World most prescribed medicine unavailable (when cost of goods are
no longer covered by medicine pricing even as generics)

Older and newly marketed medicines : planned obsolescence ? A consequence of patent life ?



Médecine Modifié à 08:04



L'obsolescence programmée existe aussi dans le domaine pharmaceutique



L'obsolescence programmée existe aussi dans le domaine pharmaceutique Audio de l'info / 1 min. / hier à 07:00

Les brevets qui protègent les nouveaux médicaments permettent à l'industrie pharmaceutique d'engranger des bénéfices. Au terme des vingt ans de couverture, les fabricants n'hésitent pas à dénigrer leur propre produit.

Breaking news RTS/SSR 2018

Older and newly marketed medicines : planned obsolescence ? A consequence of patent life and consequences on healthcare costs



ADCHOICES

Allen Frances, M.D., Contributor

Allen Frances MD is Professor Emeritus of Psychiatry and former Chair at Duke University

New Drugs Are Often Bad For Patients, Great For Pharma

10/07/2016 08:22 pm ET | Updated Oct 08, 2017

The business model that generates huge profits for the drug industry depends on planned obsolescence. The big bucks are earned when a drug is still on patent, free of competition, and can be outrageously priced.

Pharma has developed all sorts of devious tricks to extend the duration of its patent monopoly on older drugs and also works hard to develop new “me too” drugs that provide no advantage to patients, but protect its monopoly pricing power.

Pharma research has failed to produce much real progress in fighting disease, largely because curing disease is not its mission. Instead, most Pharma research is tied to marketing and lobbying- with the primary goal of generating profit, not helping patients.

BUILDseriesLDN

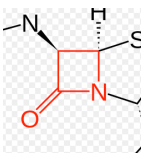
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AdChoices

WHAT IS THE VALUE OF 4 MONTHS LIFE EXTENSION ? eg cancer onco immuno drugs.



Generics, Biosimilars : and alternative to medicine shortage ? a different business model with re-innovative Pharma

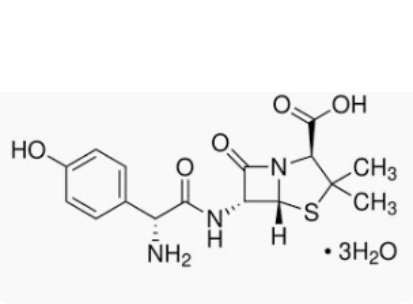
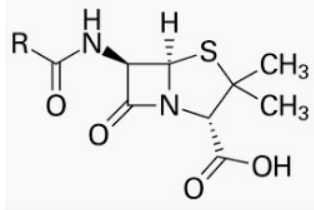


Info Sport Culture

TV & Streaming Audio

Radio Proche-Orient Ukraine Suisse Monde Economie Santé Société Environnement

L'usine de pénicilline de Sandoz en Autriche ou le défi de produire européen



Generics and Biosimilars : and opportunity to reduce the ever raising health care costs ?



Sandoz Ltd (now independent of Novartis Ltd) produces 80% of its Generics and Biosimilars in Austria (Kundl, Tyrol) and Slovenia (2024)

Breaking news : Big pharma business model in USA in danger : potentially 250% custom taxes on Novartis and Roche medicines



A challenge worth billions

Trump wants to dictate prices to Roche and Novartis in future



Pharmaceutical giant Roche may soon have to let Trump dictate its prices. (symbolic image)

Bild: sda

An innovative cancer drug from Roche or Novartis costs many times as much in the USA as it does here - for now. This is because US President Trump wants to shift the balance of power in the global pharmaceutical market.



HEALTH AND SCIENCE

Trump's pharmaceutical tariffs could affect some drugmakers more than others

July 29, 2025

PUBLISHED TUE, JUL 29 2025-3:05 PM EDT | UPDATED TUE, JUL 29 2025-4:25 PM EDT

 Annika Kim Constantino
@ANNIKAKIMC

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KEY POINTS

- President Donald Trump is slated to impose tariffs on pharmaceuticals imported into the U.S. any day now – and they may have a bigger impact on some drugmakers than others.
- AbbVie, Bristol Myers Squibb and Eli Lilly appear “relatively well-positioned” based on their manufacturing footprint in the U.S. compared to abroad, while Novartis and Roche look more at risk, TD Cowen analyst Steve Scala said in a note.
- Still, it is unclear what those levies will look like, and analysts say it is difficult to fully assess the risks to individual drugmakers based on available information.



Kupferaktien sind heiß

US laws have enabled world most prescribed medicine 4x more expensive to US patients, compared to the rest of world



practical examples of patentable data in biomedical research
when, how much, claim validity
chemistry vs biology patents
patenting genes, mice strains etc ?
gene reporter assays ?

How would you defend your inventorship ?

<http://patft.uspto.gov/>

Medicines patent pool : enabling access to sub-licences

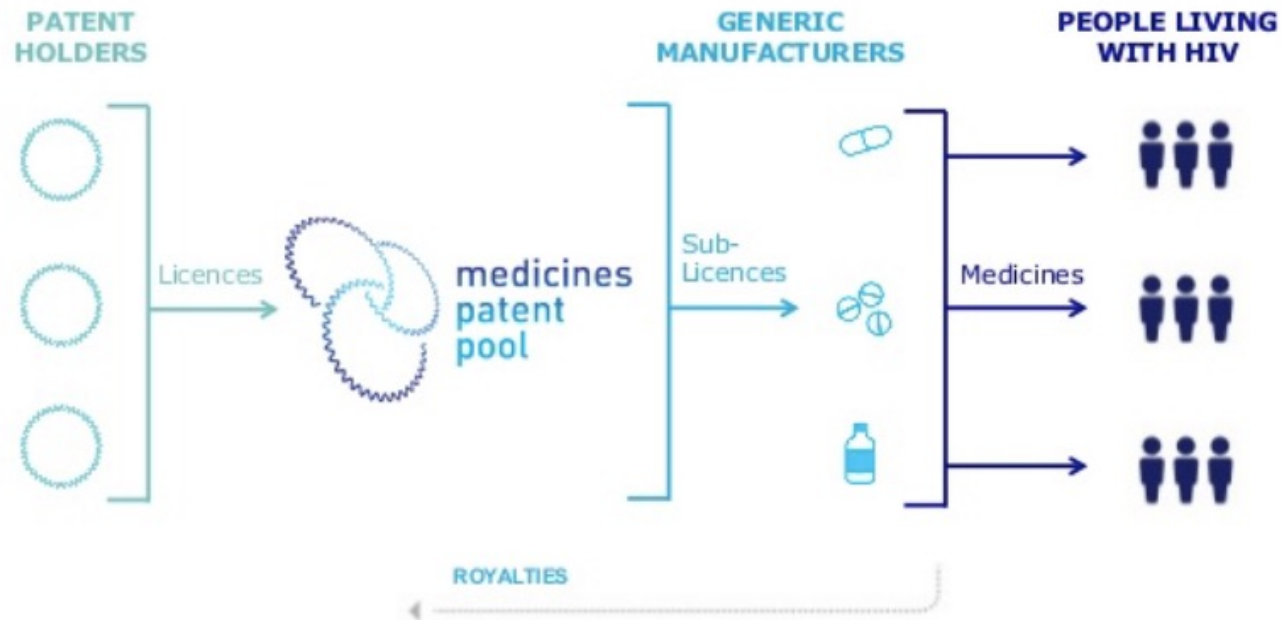


<https://medicineslawandpolicy.org/covid-19/>



medicines
patent
pool

How the MPP works



no start up/ no biotech added value without intellectual property :
First patent your invention then publish in best journal!



US009994605B2

(12) **United States Patent**
Ernst et al.

(10) **Patent No.:** **US 9,994,605 B2**
(45) **Date of Patent:** **Jun. 12, 2018**

(54) **CARBOHYDRATE LIGANDS THAT BIND TO IGM ANTIBODIES AGAINST MYELIN-ASSOCIATED GLYCOPROTEIN**

FOREIGN PATENT DOCUMENTS

WO 97/07810 A1 3/1997
WO 00/020871 * 4/2000

(71) Applicant: **UNIVERSITAET BASEL**, Basel (CH)

OTHER PUBLICATIONS

(72) Inventors: **Beat Ernst**, Magden (CH); **Ruben Herrendorff**, Basel (CH); **Andreas Steck**, Epalinges (CH); **Fan Yang**, Basel (CH)

Ariga et al., "Characterization of Sulfated Glucuronic Acid Containing Glycolipids Reacting with IgM M-proteins in Patients with Neuropathy," Journal of Biological Chemistry 262(2):848-853 (1987).

(73) Assignee: **UNIVERSITAET BASEL**, Basel (CH)

Gallego et al., "Epitope Diversity of N-Glycans from Bovine Peripheral Myelin Glycoprotein PO Revealed by Mass Spectrometry and Nano Probe Magic Angle Spinning ¹H NMR Spectroscopy," Journal of Biological Chemistry 276(33):30334-30844 (2001).

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. days.

Herrendorff et al., "Selective in vivo removal of pathogenic anti-MAG autoantibodies, an antigen-specific treatment option for anti-MAG neuropathy," Proceedings of the National Academy of Sciences USA 114(18):E3689-E3698 (2017).

(21) App. No.: **15/124,215**

(22) PCT Filed: **Mar. 12, 2015**

Sarkar et al., "Synthesis and glycosaminoglycan priming activity of three disaccharides related to the linkage region tetrasaccharide of proteoglycans," Carbohydrate Research 279:161-171 (1995).

(86) PCT No.: **PCT/EP2015/055140**

§ 371 (c)(1),
(2) Date: **Sep. 9, 2016**

Simon-Haldi et al., "Identification of a peptide mimic of the L2/HNK-1 carbohydrate epitope," Journal of Neurochemistry 83(6):1380-1388 (2002).

(87) PCT Pub. No.: **WO2015/136027**

PCT Pub. Date: **Sep. 17, 2015**

eg RARE disease anti MAG start up !

Primary Examiner — Traviss C McIntosh, III

How a patent looks like _closer look at the NFκB patent: “enough details for someone skilled in the art to use the patent as recipe to recreate the invention”



US006410516B1

(12) **United States Patent**
Baltimore et al.

(10) Patent No.: **US 6,410,516 B1**
(45) Date of Patent: **Jun. 25, 2002**

(54) **NUCLEAR FACTORS ASSOCIATED WITH TRANSCRIPTIONAL REGULATION**

(75) Inventors: David Baltimore, New York, NY (US); Ranjan Sen, Cambridge; Phillip A. Sharp, Newton, both of MA (US); Harinder Singh, Chicago, IL (US); Louis Staudt, Silver Springs, MD (US); Jonathan H. Lebowitz, Zionsville, IN (US); **Albert S. Baldwin, Jr., Chapel Hill, NC (US); Roger G. Clerc, Binningen (CH); Lynn M. Corcoran, Melbourne (AU); Patrick A. Baenerle, Eichenau (DE); Michael J. Lenardo, Potomac, MD (US); Chen-Ming Fan, San Francisco; Thomas P. Maniatis, Belmont, both of MA (US)**

(73) Assignees: President & Fellows of Harvard College; Massachusetts Institute of Technology; Whitehead Institute for Biomedical Research, all of Cambridge, MA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

OTHER PUBLICATIONS

Gosh, S. and Baltimore, D., "Activation in vitro of NF-κB by phosphorylation of its inhibitor IκB," *Nature*, 344(6267): 678-682 (1990).

Zabel, U. and Baerle, P., "Purified Human IκB Can Rapidly Dissociate the Complex of the NF κB Transcription Factor with its Cognate DNA," *Cell*, 61:255-265 (1990).

Haskill, S., et al., "Characterization of an Immediate-Early Gene Induced in Adherent Monocytes That Encodes IκB-like Activity," *Cell*, 65:1281-1289 (1991).

Baldwin, Jr., A.S., and Sharp, P.A., "Two transcription factors, NF-κB and H2TF1, interact with a single regulatory sequence in the class I major histocompatibility complex promoter," *Proc. Natl. Acad. Sci. USA*, 85:723-727 (1988).

Böhmlein, E., et al., "The Same Inducible Nuclear Proteins Regulates Mitogen Activation of Both the Interleukin-2 Receptor-Alpha Gene and Type 1 HIV," *Cell*, 53:827-836 (1988).

Leung, K. and Nabel, G.J., "HTLV-1 transactivator induces interleukin-2 receptor expression through an NF-κB-like factor," *Nature*, 333:776-778 (1988).

Ruben, S., et al., "Cellular Transcription Factors and Regulation of IL-2 Receptor Gene Expression by HTLV-1 tax Gene Product," *Science*, 241:89-92 (1988).

Lenardo, J.J., et al., "NF-κB protein purification from bovine spleen: Nucleotide stimulation and binding site specificity," *Proc. Natl. Acad. Sci. USA*, 85:8825-8829 (1988).

Wirth, T. and Baltimore, D., "Nuclear factor NF-κB can interact functionally with its cognate binding site to provide lymphoid-specific promoter function," *The EMBO Journal*, 7 (10):3109-3113 (1988).

Nelsen R. et al. "The NF-κB Binding Site Mediates

In USA,
patent life
may be
extended up
to 40 years

(21) Appl. No.: **08/464,364**

(22) Filed: **Jun. 5, 1995**

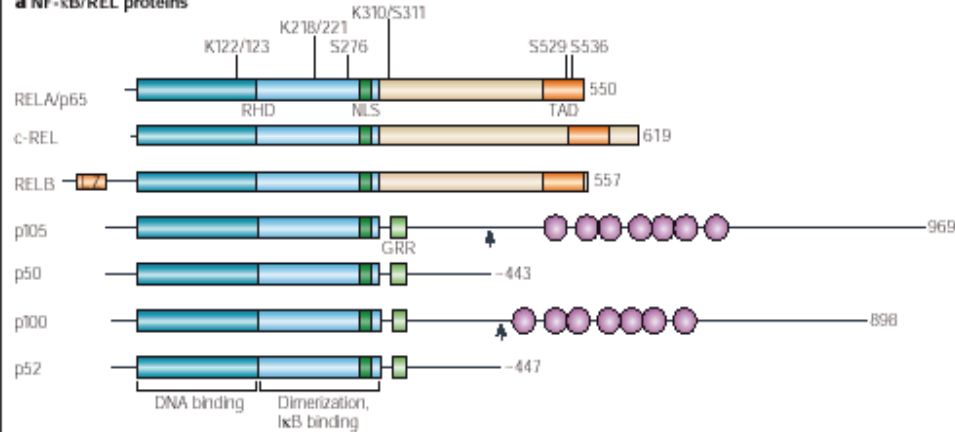
Related U.S. Application Data

The NF κ B/REL Family and I κ B Proteins

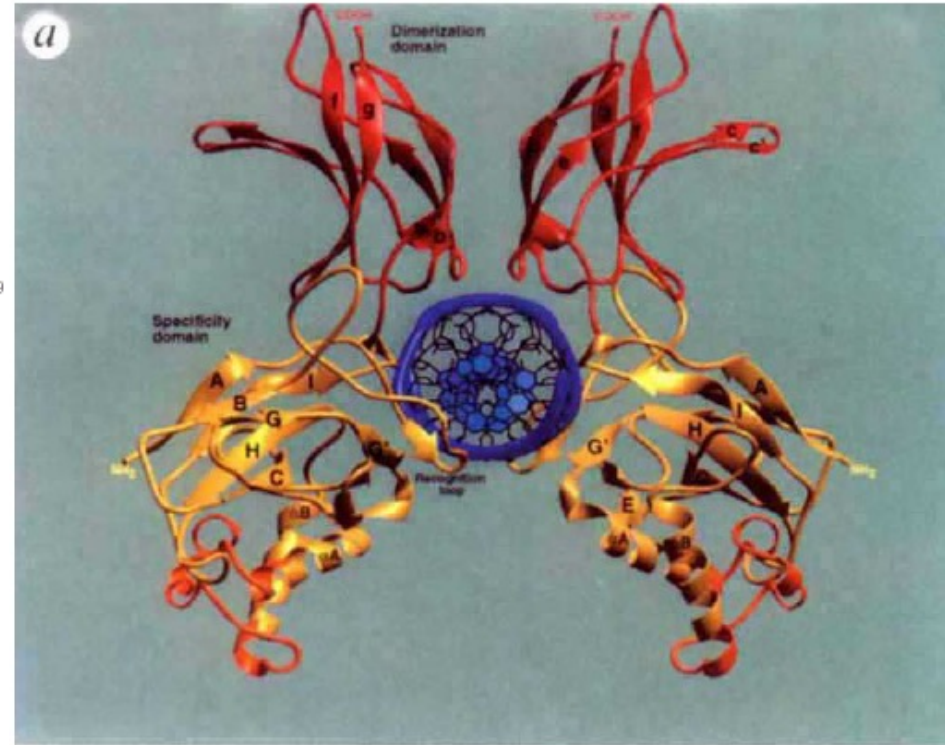
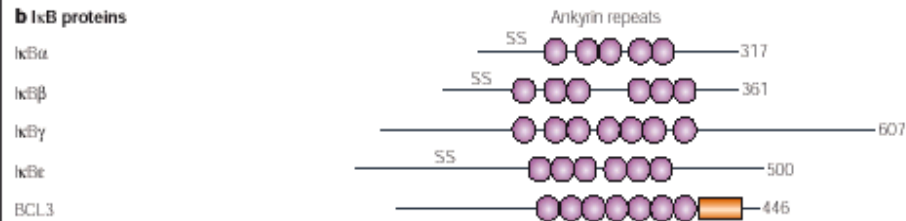


Box 1 | The family of mammalian NF- κ B/REL and I κ B proteins

a NF- κ B/REL proteins



b I κ B proteins

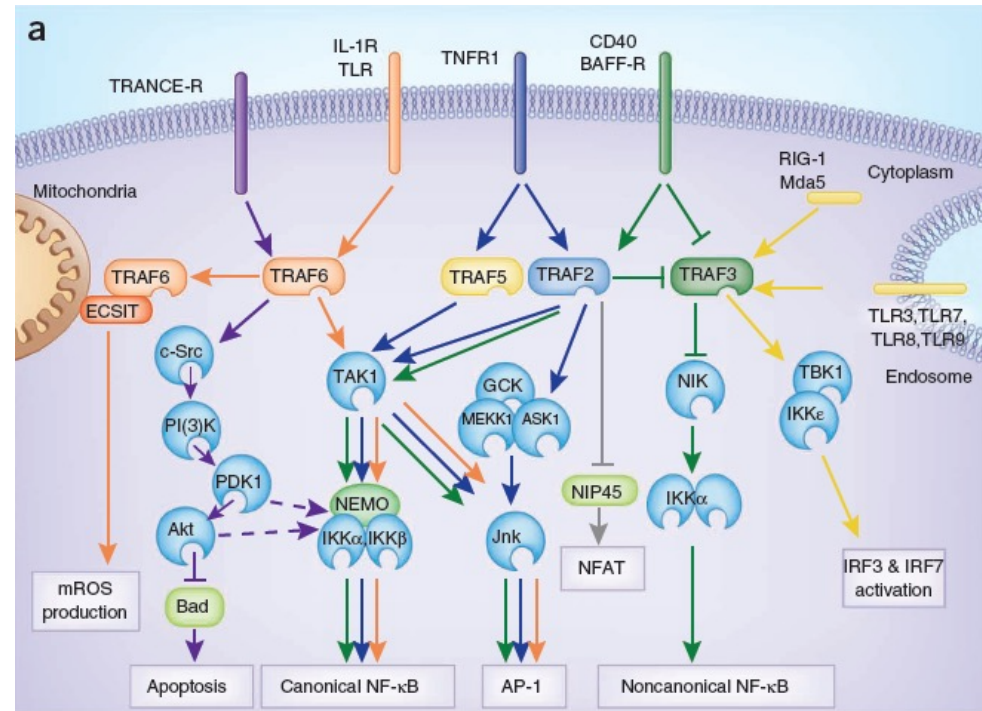
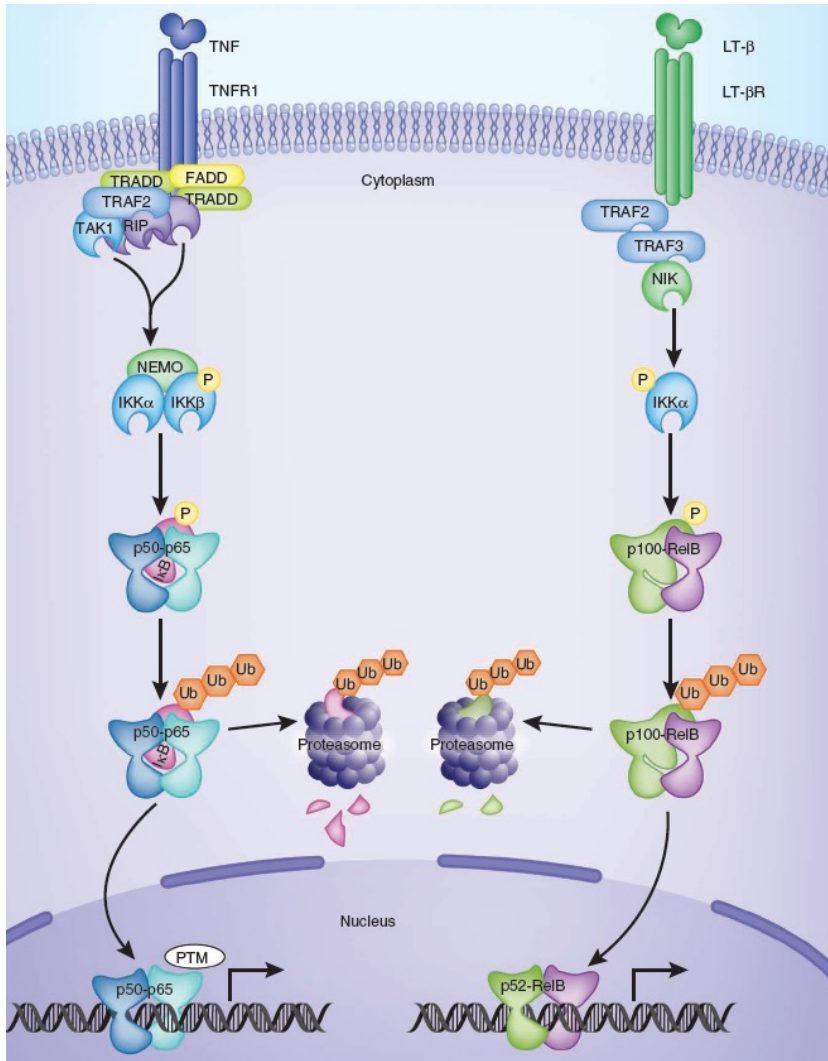


NF-kappa B p50 homodimer bound to DNA

Müller CW, Harrison SG and Verdine GL. Nature 373:311-317

THE NF κ B/REL FAMILY AND I κ B PROTEINS ARE THE FINAL EFFECTORS OF THE TNF CELLULAR SIGNAL CASCADE

The NF κ B System: Signal Induced Degradation of Cytosolic Inhibitor Proteins Which Activates the TF



TRX factors such as NF κ B are final effectors of various cellular signaling pathways : 25 years on !

Prototypical inflammatory signal pathway

Oeckinghaus A. Hayden M. Ghosh S (2011) Nature Immunology 12:695-708



TNF- and Cancer Therapy–Induced Apoptosis: Potentiation by Inhibition of NF- κ B

Cun-Yu Wang, Marty W. Mayo, Albert S. Baldwin

Many cells are resistant to stimuli that can induce apoptosis, but the mechanisms involved are not fully understood. The activation of the transcription factor–kappa B (NF- κ B) by tumor necrosis factor (TNF), ionizing radiation, or doxorubicin (a cancer chemotherapeutic compound), was found to protect from apoptosis. Inhibition of NF- κ B nuclear translocation enhanced apoptotic killing by TNF, but not by apoptotic stimuli that do not activate NF- κ B. These results suggest that NF- κ B activation is a critical step in the resistance to apoptosis.

Table 1. Chronic inflammatory diseases associated with NF- κ B activation

NF- κ B activation in human inflammatory diseases

Rheumatoid arthritis

Atherosclerosis

Chronic obstructive pulmonary disease (COPD)

Asthma

Multiple sclerosis

Inflammatory bowel disease (IBD)

Ulcerative colitis

Adapted from Tak and Firestein 2001.

NF-IL6 AND NF- κ B IN CYTOKINE GENE REGULATION

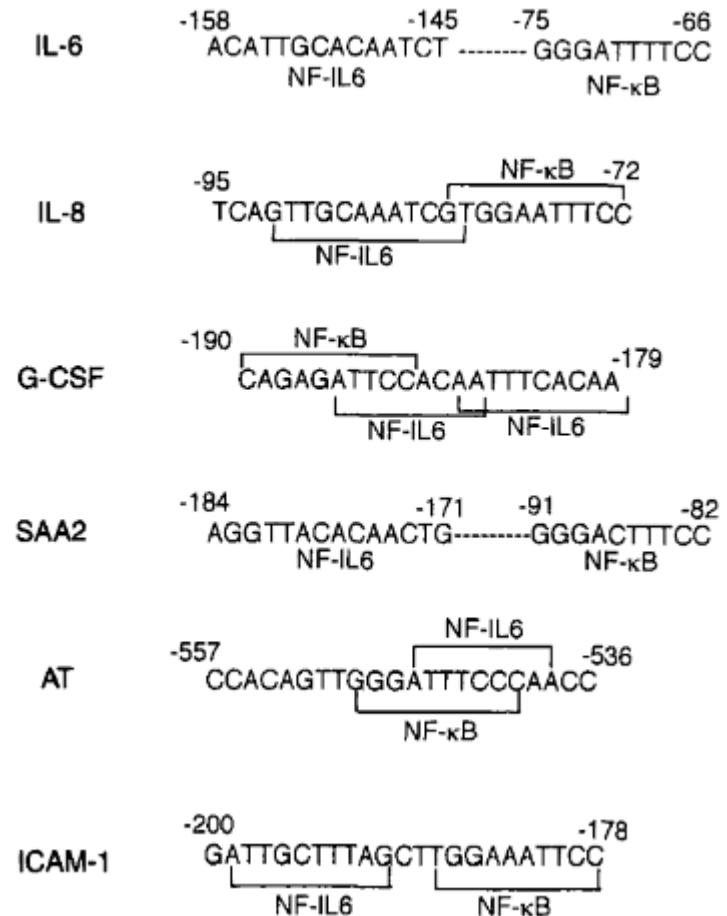




Table I. Autoimmune Diseases Associated with Dysregulated Nuclear Factor (NF) κ B Activation.

Disease	Dysregulation	Reference
Rheumatoid arthritis (RA)	Constitutive NF- κ B activation seen in the synovium. Increased NF- κ B DNA binding activity in RA patients.	28, 29
Systemic lupus erythematosus (SLE)	Abnormal NF- κ B activity in T cells with increased expression of c-Rel and decreased p65 expression. NF- κ B binding activity is absent in a subset of SLE patients.	33–35
Type I diabetes mellitus (T1D)	Increased NF- κ B activation in peripheral blood mononuclear cells. RelA, p50, c-Rel, and RelB DNA binding are impaired in DCs, while p65 and RelB are constitutively activated in monocytes in T1D patients.	221, 222
Ulcerative colitis (UC)	NF- κ B activation is seen in inflamed UC mucosa, predominantly in macrophages and epithelial cells.	30, 31
Crohn's disease	Increased NF- κ B activation in the inflamed bowel, localized to macrophages and lymphocytes. Increased nuclear levels of p65 seen in the lamina propria.	30–32
Multiple sclerosis (MS)	NF- κ B activation seen in MS brain tissue, predominantly in astrocytes, microglia, oligodendrocytes, and infiltrating macrophages. Increased nuclear levels of p65, c-Rel, p50, and I κ B α seen in macrophages in active MS lesions.	223, 224

NFkB patent : Dr. Clerc 's hearing US Federal Court Los Angeles (CA) USA

In US patent life can be extended up to 40 years



(12) **United States Patent** **Baltimore et al.**

(54) **NUCLEAR FACTORS ASSOCIATED WITH
TRANSCRIPTIONAL REGULATION**

(75) **Inventors:** David Baltimore, New York, NY (US);
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Sharp, Newton, both of MA (US);
Harinder Singh, Chicago, IL (US);
Louis Staudt, Silver Springs, MD (US);
Jonathan H. Lebowitz, Zionsville, IN
(US); Albert B. Baldwin, Cary, North
Carolina, NC (US); Roger G. Clerc,
Birmingen (CH); Lynn M. Corcoran
Port Melbourne (AU);
Baeuerle, Eichenau (DE); Michael J.
Lenardo, Potomac, MD (US);
Chen-Ming Fan, San Francisco;
Thomas P. Maniatis, Belmont, both of
MA (US)



Lilly loses Evista, Xigris patent case; will appeal

5th May 2006

by
PharmaTimes

Eli Lilly has been defeated in a patent infringement lawsuit, brought by Ariad Pharmaceuticals, that could see it having to pay royalties on its Evista osteoporosis drug and Xigris for sepsis.

The plaintiffs' claims were based on the discovery of a messenger cell, called NF-κB, that controls the proteins a cell makes and in what quantities, thus playing a major role in several diseases. Harvard, MIT and Whitehead licensed the patent to Ariad, based in Cambridge.

In early May, a federal jury awarded at least \$65.2 million to Ariad Pharmaceuticals Inc. after finding that Eli Lilly's Evista and Xigris products infringed on an Ariad patent. Eli Lilly said it would take the case the U.S. Court of Appeals for the Federal Circuit if it has to.

patent trial_NFκB case : 2005-2007



Biopharmaceutical injectable fusion peptide between TNF receptor of IG1 for blocade In vivo of TNF (150 kDa)
Rheumatoid arthritis
Dermatology psoriasis



Q3 '15 Enbrel® Sales Grew 30% YoY

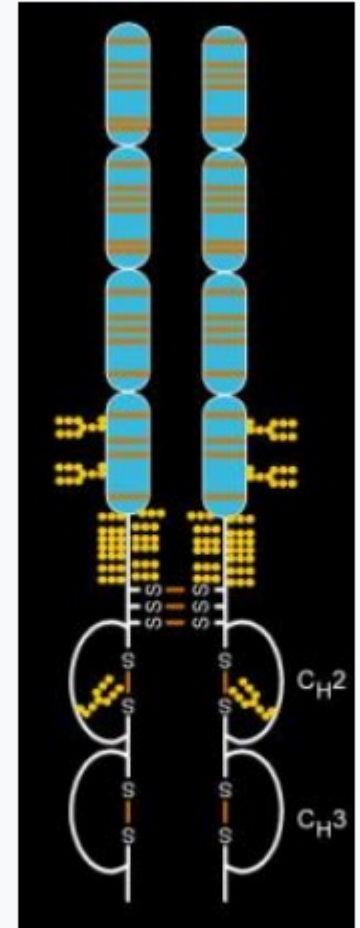
\$ Millions, Net Sales



Highlights

- YoY sales growth driven by net selling price* and low inventory levels in the prior year period, offset partially by the impact of competition
- Rheumatology and dermatology segments grew YoY 25% and 38%, respectively, on a value basis
- Rheumatology share was relatively stable QoQ at 28%, while dermatology share was down 2 points QoQ to 24%
 - New dermatology entrants growing the market

*Net selling price represents the impact of list price changes as well as contracting and access changes
Note: Inventory represents wholesaler and, based on prescription data, end-user inventories
Provided October 28, 2015, as part of an oral presentation and is qualified by such, contains forward-looking statements, actual results may vary
materially. Amgen disclaims any duty to update.



Clinical data

Trade names

Enbrel

soluble TNFR-II-human Fc fusion

2005-2007: Dr. Clerc 's hearing US Federal Court Los Angeles CA (USA)



Amgen's attempt to clear its products, Enbrel and Kineret, will now go forward after Judge Kent A. Jordan denied Ariad's motion to dismiss the case. The drugs have generated huge revenues for the company, which pulled in more than \$12.3 billion in revenue in 2005.

Ariad's attorneys, from the Los Angeles office of Irell & Manella LLP, filed a motion to dismiss the case on June 14, in which they argued that Amgen had failed to demonstrate that an "actual controversy" existed to support a declaratory judgment.

In the same motion, Ariad also argued the Amgen had failed to "join indispensable parties to the suit," namely Harvard University, the Massachusetts Institute of Technology and MIT's independent Whitehead Institute.

The three institutions collectively own the Ariad patent targeted in the lawsuit.



(12) **United States Patent** **Baltimore et al.**

(54) **NUCLEAR FACTORS ASSOCIATED WITH TRANSCRIPTIONAL REGULATION**

(75) Inventors: David Baltimore, New York, NY (US); Ranjan Sen, Cambridge; Phillip A. Sharp, Newton, both of MA (US); Harinder Singh, Chicago, IL (US); Louis Staudt, Silver Springs, MD (US); Jonathan H. Lebowitz, Zionsville, IN (US); Robert S. Baldwin, Jr., Chapel Hill, NC (US); Roger G. Clerc, Muenzingen (CH); Lynn M. Corcoran, Port Mellon, PA (US); Peter H. Baeuerle, Eichenau (DE); Michael J. Lenardo, Potomac, MD (US); Chen-Ming Fan, San Francisco; Thomas P. Maniatis, Belmont, both of MA (US)

***NFkB patent infringement : Dr. Clerc 's hearing @ US Federal Court
LosAngeles CA (USA)***



“Es ist alles andere als alltaglich, dass der Dozent vor dem Federal Court sein Patent verteidigen musste” *dixit Rafael Muller MScPharm University of Basel Switzerland*



***NFkB patent infringement : Dr. Clerc 's hearing @ US Federal Court
LosAngeles CA (USA)***

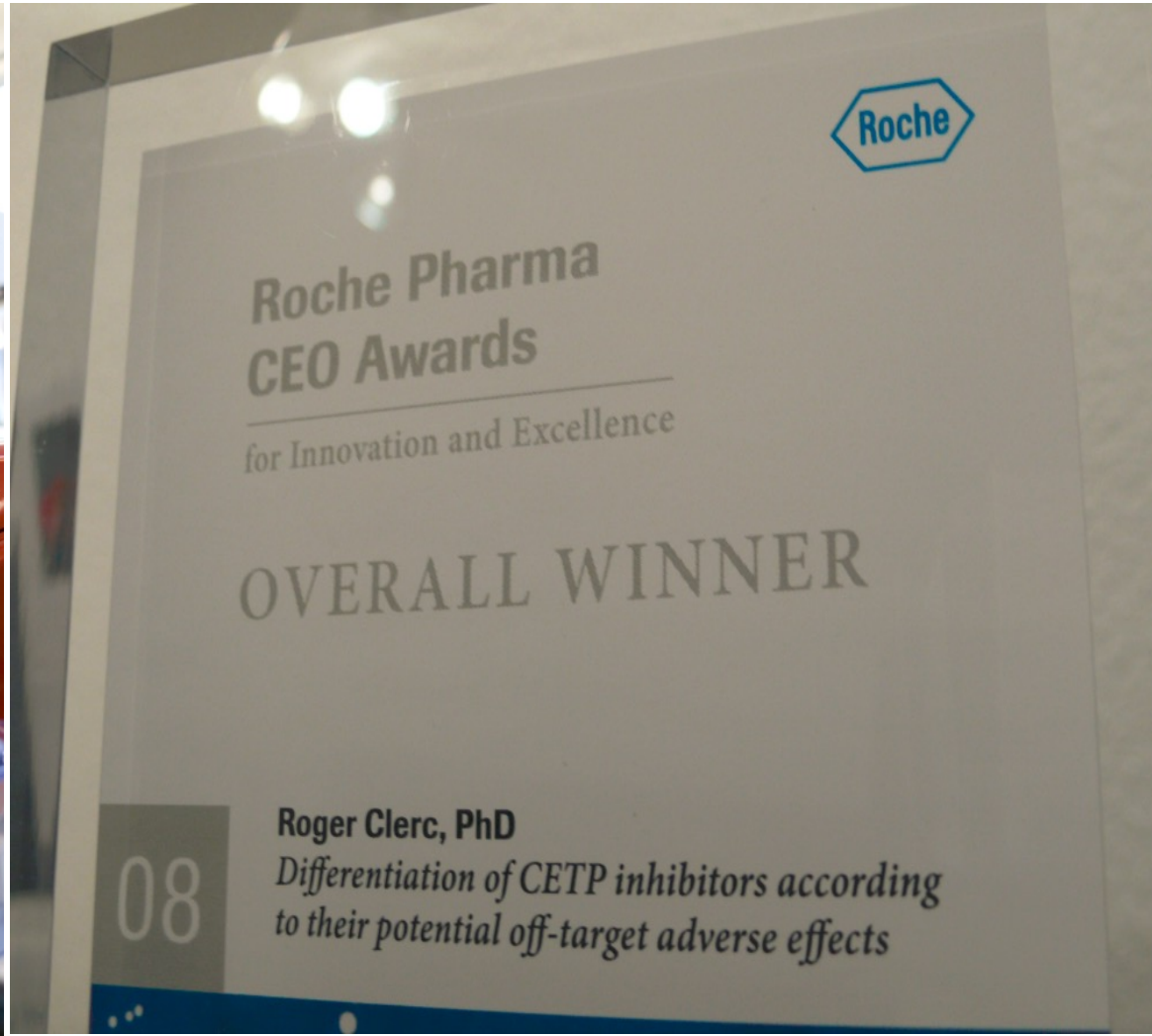


“Es ist alles andere als alltaglich, dass der Dozent vor dem Federal Court sein Patent verteidigen musste” dixit Rafael Muller MScPharm University of Basel Switzerland

JUL 10 2007

5:22:54PM

**Biomedical research : team work is a must
Intellectual property belongs to the team !**





NEWS IN FOCUS

INTELLECTUAL PROPERTY

Titanic clash over CRISPR patents turns ugly

Accusations of impropriety feature in escalating dispute.

News and Views : Nature (2017) 543:296-297

East coast vs west coast ?

Whose discovery is it ? the CRISPR heroes !

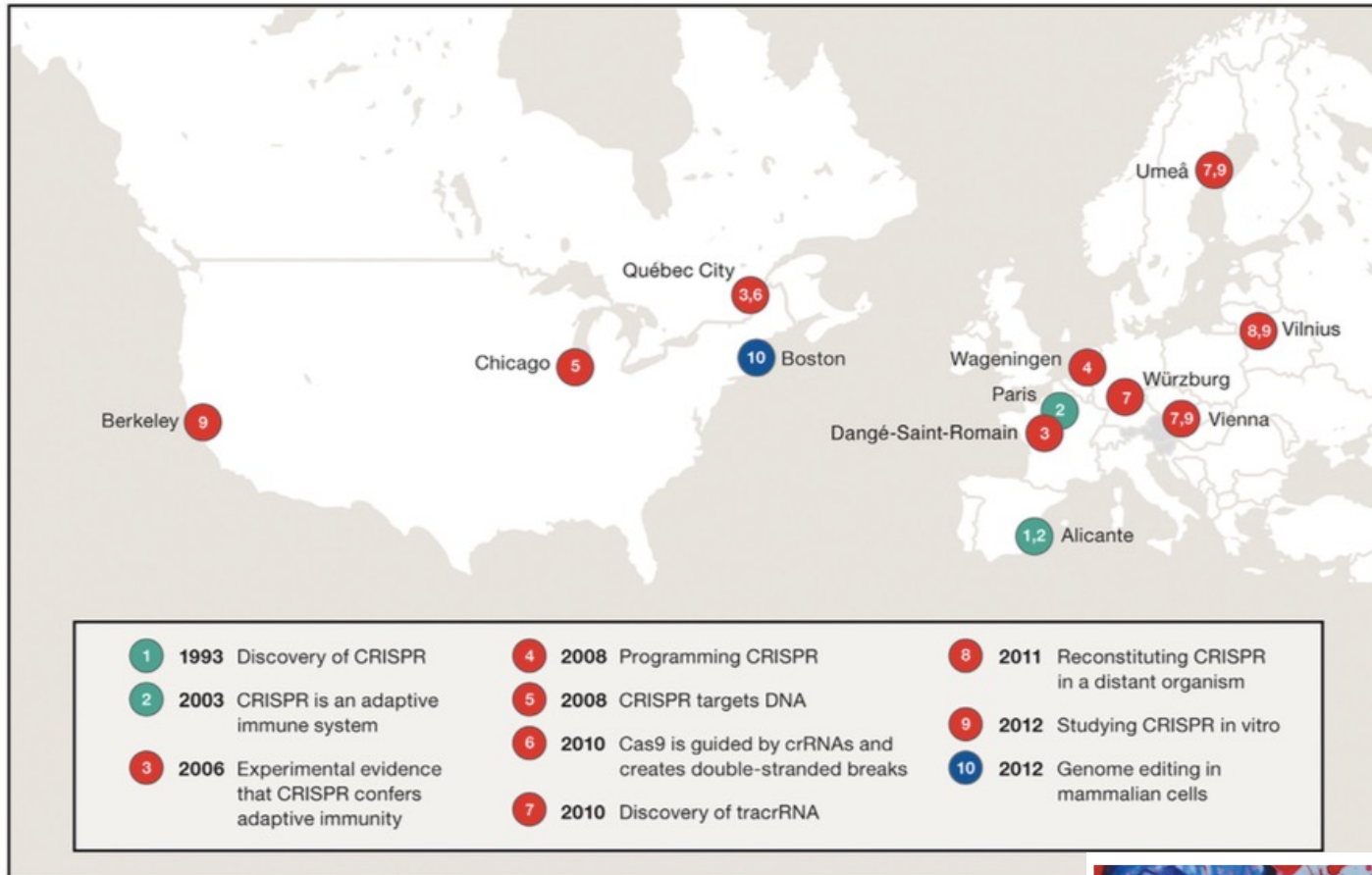


Figure 2. The Twenty-Year Story of CRISPR Unfolded across Twelve Cities in Nine Countries

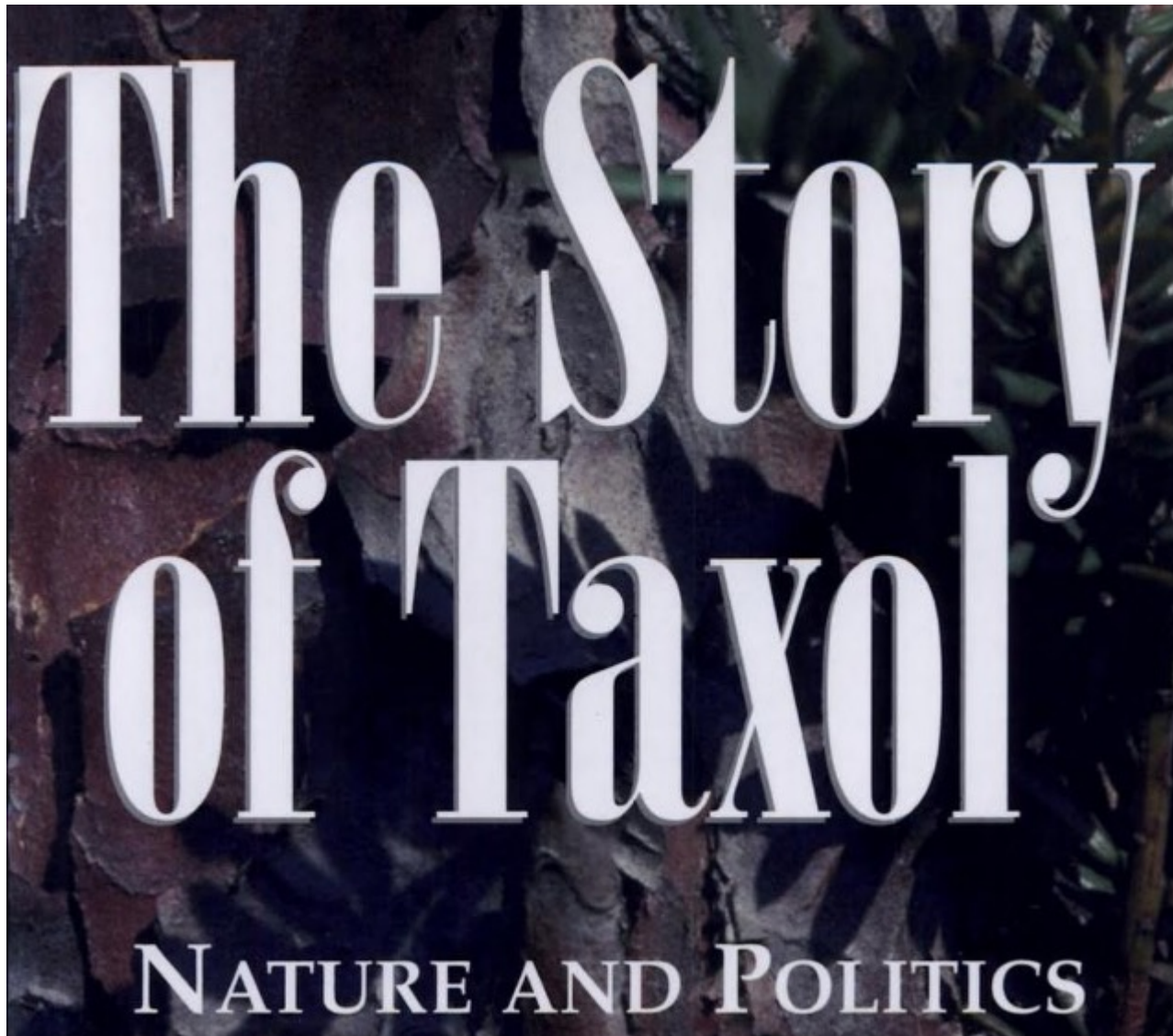


Patent trial_Crispr/Cas9 case_hot debate today !



RESEARCH MANAGEMENT

A delicate balance




WORKSHOP

Who owns natural products intellectual property ? eg taxol



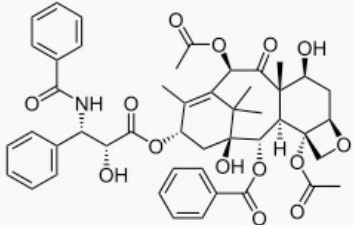
taxol became Taxol®

Taxus



L'if commun (*Taxus baccata*).

Paclitaxel



Identification

Nom UICPA acide β -(benzoylamino)- α -hydroxy -6,12b-bis(acétyloxy)-12-(benzoyloxy)-2a,3,4,4a,5,6,9,10,11,12,12a,12b-dodécahydro-4,11-dihydroxy-4a,8,13,13-tétraméthyl-5-oxo-7,11-méthano-1"H"-cyclodéca(3,4)benz(1,2-b)oxet-9-yl ester, (2a"R", (2a-a,4- β ,4a- β ,6- β ,9-a(α -"R", β -"S"), 11-a,12-a,12a-a,""2b-a))-benzènepropanoïque





taxol became Taxol®

The discovery of taxol, its characterization and costly many synthesis steps
large scale production - **paclitaxel®** eg. 6 g amounts to CHF 150.000.-

How changing ownership of the mostly used anti-cancer drug affects pharma
and the patients

How do you address the intellectual property of natural products used in the
pharmacopoeia ; is the country of origin owner of the intellectual property ?

Effect of privatization of intellectual property affects the pricing of medicine
and patients at large

Who owns natural products property ?



natural product became NATURALPRODUCT[®]

WORKSHOP



Medicine pricing : how much may potentially life saving drugs cost ? what is the price of a living human ?





Medicine pricing : how much may potentially life saving drugs cost ? what is the price of a few months life extension ? at what patient life quality ?

Industries | The Big Take

Cancer Drugs Cost More Than Ever. They Often Don't Extend Lives

By [Robert Langreth](#), [Tanaz Meghjani](#) and [Rachael Dottle](#)
May 28, 2025



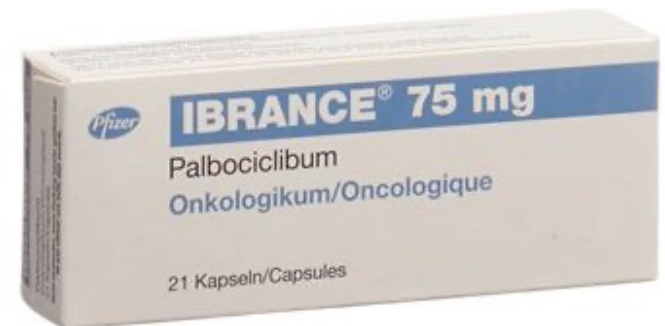
The moment she heard that her mother, then 67, had advanced breast cancer, Stacie Dusetzina began hunting for potential treatments. A cancer policy researcher at Vanderbilt University, Dusetzina knew the go-to drug in many cases was Pfizer Inc.'s Ibrance. She learned it might cost her mother, who lived on a fixed income, around \$10,000 out of pocket annually.

Medicare, required by law to cover cancer treatment, would have paid much of the rest of the cost. At the time, in 2020, the pill listed for a jaw-dropping \$160,000 a year, rising more recently to \$214,000.

Despite having a PhD in pharmaceutical science, Dusetzina couldn't figure out whether swallowing those costs – potentially for years – would help her mom live any longer or any better. Her research showed that while the drug might shrink tumors, no clinical trials proved it would extend her mother's life. At the time of her search,

Utilisation et Mécanisme d'Action:

- Ibrance est un inhibiteur de protéine kinase, spécifiquement de la CDK4/6, qui joue un rôle dans la division et la croissance des cellules cancéreuses.
- Il est utilisé pour bloquer la progression du cancer du sein en inhibant la prolifération des cellules tumorales.
- Il est généralement prescrit en association avec un inhibiteur de l'aromatase comme le létrozole, ou avec le fulvestrant, chez les femmes ayant déjà reçu une hormonothérapie.
- Le traitement est administré par voie orale, sous forme de gélules, et le schéma posologique habituel est de 125 mg par jour pendant 21 jours, suivi d'une pause de 7 jours, formant un cycle de 28 jours.



Medicine pricing : how much may potentially life saving drugs cost ?

eg. Kymriah (CAR-T) price tag $475 \cdot 10^6$ \$ relapsed or refractory (r/r) B-cell acute lymphoblastic leukemia (ALL)

eg. a soccer player : is $121 > 10^6$ € the price tag of a human life ?



121 Millionen Euro hat Chelsea für Enzo Fernández an Benfica Lissabon bezahlt. Das ist englischer Rekord.

Pedro Nunes / Reuters



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Pharmaceutical Pricing Policy project

The OECD Pharmaceutical Pricing Policy project had two main objectives:

- ▶ To add to the base of information about pharmaceutical pricing policy in OECD countries and develop a taxonomy and framework for making international comparisons of policies
- ▶ To analyse cross-national impacts and implications of policies, particularly with respect to the impacts on pharmaceutical prices paid in other countries and on pharmaceutical R&D





Global development Football Tech Business Environment Obituaries

\$2.1m Novartis gene therapy to become world's most expensive drug

US approves the one-time treatment for deadly spinal muscular atrophy in infants



▲ Swiss drugmaker Novartis has gained US approval for its \$2.1m spinal muscular atrophy gene therapy Zolgensma.

Zolgensma: spinal muscular atrophy innovative gene therapy medicine : pay for performance pricing policy



BIOTECH AND PHARMA

FDA approves Novartis' \$2.1 million gene therapy — making it the world's most expensive drug

PUBLISHED FRI, MAY 24 2019 • 1:03 PM EDT | UPDATED FRI, MAY 24 2019 • 3:11 PM EDT



Berkeley Lovelace Jr.
@BERKELEYJR



Angelica LaVito
@ANGELICALAVITO

SHARE   

KEY POINTS

- The FDA approved Novartis' Zolgensma, a one-time treatment for spinal muscular atrophy.
- Zolgensma, a gene therapy, will cost \$2.1 million.
- Novartis had previously said it could price the treatment between \$1.5 million and \$5 million.



Adeno-associated viral dependent SMN expression gene therapy indicated for the treatment of pediatric patient less than 2 years of age with spinal muscular atrophy (SMA) with bi-allelic mutations in the survival motor neuron 1 (*SMN1*) gene.

Translational oncology research - cell therapies CAR-T cells Kymriah® pay for performance pricing policy



BREAKING NEWS

- the development of genetically engineered cells that target tumor antigens is one of the most promising recent strategies in immuno-oncology.
- harnessing the patient's own immune system to target and kill cancer cells (eg chimeric antigen receptor (CAR) T-cell therapy) modified to recognize tumor antigens. Clinical trials have shown remarkable results. Clinical trials will follow.



Article | August 30, 2017

Novartis Sets a Price of \$475,000 for CAR T-Cell Therapy

Author(s): [Tony Hagen](#)

Novartis' just-approved chimeric antigen receptor (CAR) T-cell therapy tisagenlecleucel is going to be introduced on the market at a price of \$475,000 for a single infusion, an amount that is within the range anticipated by oncologists.

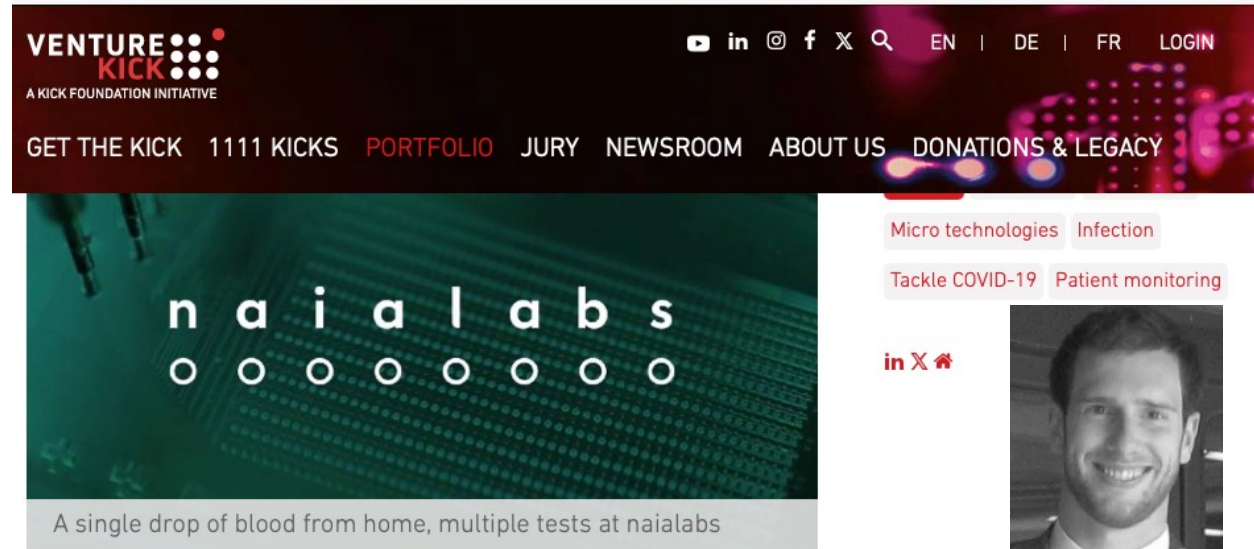
FDA approved for Acute lymphocytic leukemia (ALL), a fast-growing cancer of lymphocyte-forming cells called *lymphoblasts*. Cost CHF460.000.— **Tox warning:** cytokine storm Actemra tocilizumab as « antidote »

Emily Whitehead Fdn @EWhiteheadFdn · 10 mai
Today, we celebrate that Emily is 5 years cancer free!

Career jump : create a spin off / pharma start up



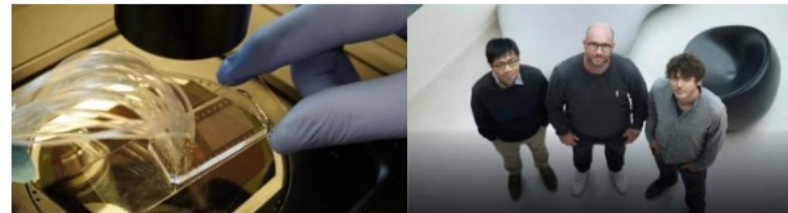
- Grégoire Michielin MD PhD at UNIL EPFL made his dream come true : the creation of a pharma start up during his MD PhD thesis @ EPFL
- 2023 “his” START-UP was born :
Naialabs
Pharmaceuticals
Inc.
- Business case built up on a micro fluidic platform MiTOMi®



naialabs uses microfluidic technology to perform immunoassays enabling measurement of antibody or protein biomarkers using reduced sample and reagent volumes with a high-throughput, automated approach.

Requiring only a few nanoliters of sample per assay, our technology allows multiple tests to be performed from a single drop of blood collected at home using existing, certified microsampling devices.

Owing to its unique capabilities, we envision that naialabs' platform will simplify population-based academic and pharmaceutical research, offer opportunities in testing biomarkers for customer-initiated health assessment, and facilitate the diagnosis of both infectious and noncommunicable diseases.



Career jump : create a spin off / pharma start up



- Nathalie Brandenburg PhD at EPFL made her dream come true : the creation of a pharma start up during her PhD thesis @ EPFL
- 2016 “her” START-UP was born : SunBioscience Inc. Business case built up on a organoids plug and pay platform Grid3D®



Hydrogels Made Simple

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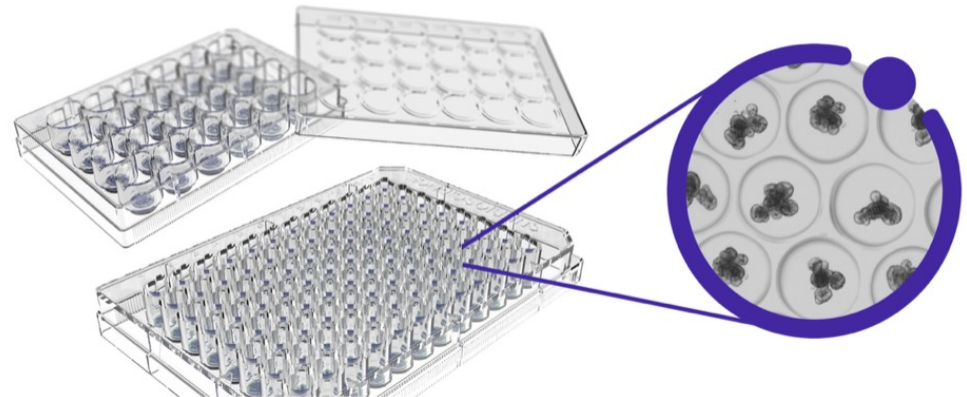
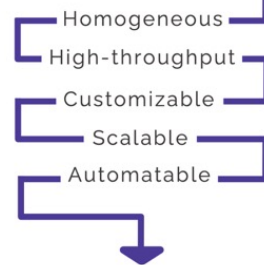
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Career jump : create a spin off / pharma start up



- Ruben Herrendorff PhD at UNIBAS made his dream come true : the creation of a pharma start up during his PhD thesis @ UNIBAS Dept of Pharmaceutical Sciences
- 2015 “his” START-UP was born : Polyneuron Pharmaceuticals Inc.
- Business case built up on a glycopolymer platform to block/decoy autoantibodies in rare autoimmune diseases (www.polyneuron.com)
- Debilitating demyelination of motor and sensory neurons



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Technology

Pipeline

Company



Antibody-Catch®

Accurate treatment for
autoimmune disorders

March 1, 2017 // Awards

Career jump : create a spin off / pharma start up



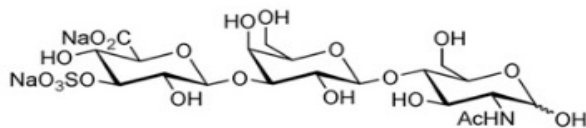
- Ruben Herrendorff PhD at UNIBAS made his dream come true : the creation of a pharma start up during his PhD thesis @ UNIBAS

Selective in vivo removal of pathogenic anti-MAG autoantibodies, an antigen-specific treatment option for anti-MAG neuropathy

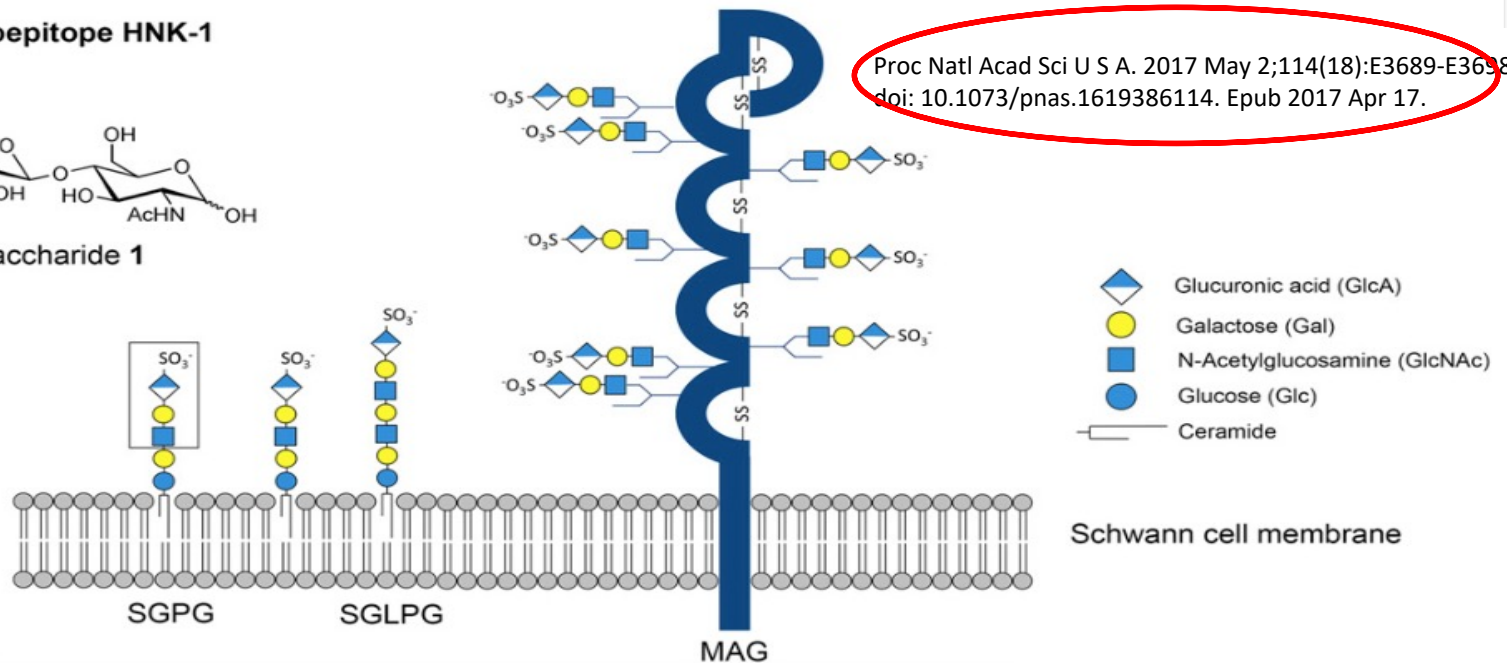
Ruben Herrendorff^a, Pascal Hänggi^a, H el ene Pfister^a, Fan Yang^a, Delphine Demeestere^a, Fabienne Hunziker^a, Samuel Frey^a, Nicole Schaeren-Wiemers^b, Andreas J. Steck^{b,c}, and Beat Ernst^{a,1}

^aInstitute of Molecular Pharmacy, Pharmacenter, University of Basel, 4056 Basel, Switzerland; ^bDepartment of Biomedicine, University Hospital Basel, University of Basel, 4031 Basel, Switzerland; and ^cClinic of Neurology, Department of Medicine, University Hospital Basel, University of Basel, 4031 Basel,

A Antigenic myelin glycopeptide HNK-1



Natural HNK-1 trisaccharide 1



B HNK-1 pharmacokinetics

EPFL TTO (technology transfer office) teaches you on intellectual property

ENG-623



🏠 / Plans d'études / Fiches de cours / MINTT: Management of Innovation and technology transfer (EDOC)

MINTT: Management of Innovation and technology transfer (EDOC)

↓ Télécharger la
fiche de cours (PDF)

ENG-623 / 3 crédits

Enseignant: [Lattuada Mauro](#)

Langue: Anglais

Remark: Registration via mintt's website (mintt.epfl.ch) //

Frequency

Every year

Summary

mintt's purpose is to provide EPFL PhD students with an accelerated training in invention management, assessment of the potential, intellectual property rights elaboration, license negotiation, start-up option evaluation and experience sharing in the field of innovation.

Content

See website mintt.epfl.ch

Dans les plans d'études

Cours généraux et externes EDOC

2025-2026

- **Nombre de places:** 30
- **Forme de l'examen:** Rapport de TP (session libre)
- **Matière examinée:** MINTT: Management of Innovation and technology transfer (EDOC)
- **Cours:** 24 Heure(s)
- **Exercices:** 8 Heure(s)
- **TP:** 25 Heure(s)
- **Type:** optionnel

Semaine de référence

Jour	Classe	Cours
Lundi 01.06.2026		
08:15-18:00	BC01	C MINTT: Management of Innovation and technology transfer (EDOC)
Mardi 02.06.2026		
08:15-18:00	BC01	C MINTT: Management of Innovation and technology transfer (EDOC)



THANK YOU.....

DO YOU HAVE ANY QUESTIONS ?

