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Topic 1: **Patent landscaping, mapping & analytics**

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Manila
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Overview

- Outline of the Workshop
  - From data of individual patents
  - To patent landscapes
- WIPO activities regarding patent landscaping
- Samples

Patent analytics is big business

Status quo in industrialized countries:

- Many commercial firms offer patent analytics/landscaping services since there is a wide range of business use of patent information
- Many companies exploit patent information and utilize patent analytics

→ Topic 3, 4, 5

What is WIPO's role in this?
What is the role of other public institutions?
What is the utility for developing countries?

→ Topics 3, 6, 8

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Business use/intelligence of patent data

- Identify existing solutions/technologies for technical problems (options for in-licensing; potential partners with know-how)
- Check for potential infringements of IP rights (Freedom-to-operate (FTO), product clearance; need for in licensing)
- Monitor competitors, e.g. for new products in the pipeline
- Identify business opportunities (out-licensing; marketing opportunities)
- Monitor expiry of protected technologies for later use, e.g. generics
- Identify development options (white spaces)
- Strategic R&D planning

Business questions

- Is it worth investing money in the development of a particular technology, or are there already solutions for our technical problem ?
  - Don’t reinvent the wheel!
  - E.g. preparing request for research funding
- Which technology trends exist and how have they developed over time? Emerging trends?
- Where are the crowded areas ?
- Are there any gaps or white spaces, i.e. areas with little patent protection, that permit business opportunities ?
  - What further applications or uses are possible ?
  - Which further adaptations or embodiments could be explored ?
  - What is not yet covered by patent claims ?

Business questions

- Which players are the most active ?
- Which other patents are most relevant for our own activites ?
  - Infringment, licensing-in, collaborations
- Is there freedom to operate ?
- Does a product infringe patent rights ?
- Which patents are about to expire ? Which technologies move in the public domain and provide business opportunities ?
- Patent portfolios of companies ? Their value?
- Who bought or sold IP rights ?
- What is the quality and value of an individual patent ?
- What is the value of a patent portfolio ?
  - Preparing merger and aquisitions

Treasures of patent Information

- **Technology information**
  - because of disclosure requirement
  - Patent publications are at forefront of emerging technologies
  - Patent publications are sometimes first publication of new technologies
- **Business / economic information**
  - derived from patenting activity of innovators; analysis of bibliographic data
  - Patents are related to technologies with commercial potential
  - Investment in global protection as indicator for potential patent value
- **Legal information**
  - Status in particular jurisdictions (freedom-to-operate)
  - Claims granted in particular jurisdictions

Aggregations of patent information

Individual application (its bibliographic, technical, legal data)

Patent family(ies) (domestic, simple, extended; technical)

Patent data collections (e.g. search results)

Collective patent information (Patent landscape reports, FTOs, ...

► Each subsequent level creates new patent information that is derived by processing the previous aggregation

► “Discovering knowledge in patent databases”

Aggregations of patent information

Various products, diverse and fuzzy terminology

→ Topic 2

- Patent landscape reports
- State of the art, infringement, patentability, novelty, validity reports
- Freedom-to-operate, clearance reports
- Technology watch (bulletins)
- Annual statistical reports
- Valuation of portfolios
- Product to patent maps
- Litigation analysis

→ Topic 18

Patent Landscaping/Mapping stages

- **Patent search** and **preparation** of a **Collection of patents,** e.g.
  - patents claiming inventions related to biofuel
  - patents filed by company X
  - patents filed in Brazil in 2012

+

- **Cleaning, Ordering and Analysis** of collection

+

- **Visualiziation** ("patent mapping") + narrative/explanation

(+

- Deriving conclusions, recommendations*)

→ Topic 3, 4, 5, 17

***delicate task !**

Preparing a collection

- Developing and refining search query
- Selecting proper database(s)

No Topic

- Size of patent collection
  - Macro level >10 000
  - Meso level 1000 – 10 000
  - Micro level <1000

<> patentability search: 1-20

- Data cleaning
  - Family reduction
  - Assignee grouping
  - Manual noise reduction

→ Topic 9

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Data sources

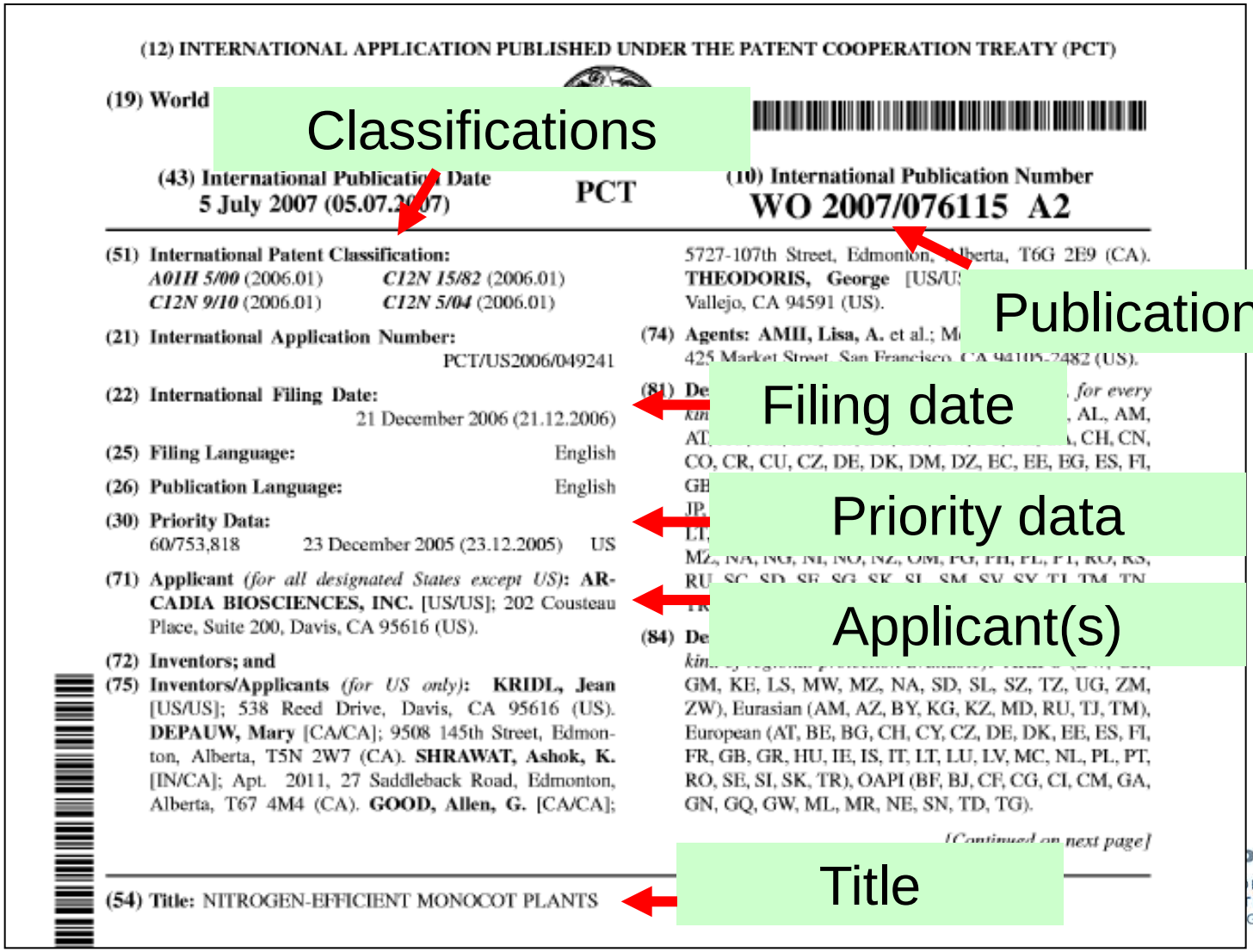
- **Primary sources:** each jurisdiction defines how **authoritative (official)** patent information is published and the respective authority in charge
  - National publications
  - Legal status, file wrapper (often combined in national patent register)

- **Secondary sources:** collect data from various primary sources and make it accessible through a single interface
  - Commercial patent databases (often include analysis tools)
  - Free-of-charge searchable patent databases:
    - hosted by some IPOs: Depatisnet, Espacenet, Patentscope
      - Derived from proprietary search systems
    - hosted by others: Google Patents, Patentlens,..

Patent information analyses

- Patent information is available as
  - **structured data**: bibliographic information (e.g. INID codes)
  - **unstructured data**: description, claims

Structured/fielded data ("PDF view")



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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PCT

(10) International Publication Number
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C12N 9/10 (2006.01) *C12N 5/04* (2006.01)

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60/753,818 23 December 2005 (23.12.2005) US

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(74) Agents: **AMII, Lisa, A.** et al.; M... 425 Market Street, San Francisco, CA 94105-2482 (US).

(81) De... *for every kin...* AL, AM, AT... CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB... JP... LT... MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN...

(84) De... *kin...* GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: NITROGEN-EFFICIENT MONOCOT PLANTS

Classifications

Publication number

Filing date

Priority data

Applicant(s)

Title

Structured/fielded data ("HTML view")

Mobile | Deutsch | Español | Français | 日本語 | 한국어 | Português | Русский | 中文 |

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1. (WO2007076115) NITROGEN-EFFICIENT MONOCOT PLANTS

PCT Biblio. Data | Description | Claims | National Phase | Notices | Documents

Latest bibliographic data on file with the International Bureau

Pub. No.: WO/2007/076115 **International Application No.:** PCT/US2006/049241
Publication Date: 05.07.2007 **International Filing Date:** 21.12.2006

IPC: ***A01H 5/00*** (2006.01), ***C12N 5/04*** (2006.01), ***C12N 9/10*** (2006.01)

Applicants: **ARCADIA BIOSCIENCES, INC.** [US/US]; 202 Cousteau Place, Suite 200, Davis, CA 95616 (US) *(For All Designated States Except US)*.
KRIDL, Jean [US/US]; (US) *(For US Only)*.
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Inventors: **KRIDL, Jean**; (US).
DEPAUW, Mary; (CA).
SHRAWAT, Ashok, K.; (CA).
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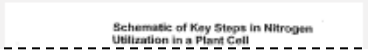
THEODORIS, George; (US)

Agent: **WARD, Michael, R.**; Morrison & Foerster LLP, 425 Market Street, San Francisco, CA 94105-2482 (US)

Priority Data: 60/753,818 23.12.2005 US

Title **(EN)** NITROGEN-EFFICIENT MONOCOT PLANTS
(FR) PLANTES MONOCOTYLEDONES AYANT UN RENDEMENT EFFICACE EN AZOTE

Abstract: **(EN)**Methods of increasing nitrogen utilization efficiency in monocot plants through genetic modification to increase the levels of alanine aminotransferase expression and plants



Patent information analyses

- Patent information is available as
  - **structured data**: bibliographic data (metadata)
  - **unstructured data**: description, claims, sequence listings
  - **(image data:** drawings, chemical formula)

- **Data mining**: structured data enable an easy
  - statistical analysis
  - network analysis

→ Topic 11
→ Topic 12

- **Text mining** of unstructured descriptions/claims/abstracts
  - Determining linguistic (semantic) content/meaning/concepts
  - Similarity between documents

→ Topic 13

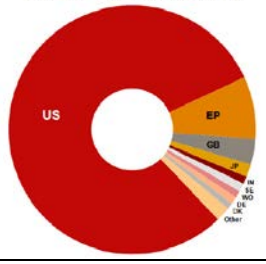
Output of analysis

Figure 15. Priority Country Information

Earliest Priority Country Code	Country or Authority Name	Inventions with no Granted Patrents	Inventions with ≥1 Granted Patent	# Records	% with grants
US	United States	785	320	1105	29%
EP	European Office	73	39	112	35%
GB	United Kingdom	32	14	46	30%
JP	Japan	14	9	23	39%
SE	Sweden	7	8	13	62%
DE	Germany	12	1	15	7%
IN	India	11	2	12	17%
WO	PCT	9	3	13	23%
DK	Denmark	10	1	11	9%
Other	13 Countries	20	10	30	33%
ALL		973	407	1380	29%

PCT Application Country Code	PCT Deposit Office	Count
US	United States	636
EP	European Patent Office	159
IB	International Bureau	46
CA	Canada	39
GB	United Kingdom	27
JP	Japan	20
SE	Sweden	14
IN	India	11
DK	Denmark	8
NL	Netherlands	5
IL	Israel	4
DE	Germany	3
FR	France	3
BE	Belgium	2
BR	Brazil	2
AU	Australia	2
CN	China	2
IT	Italy	2
ES	Spain	2
CZ	Czech Republic	1
SG	Singapore	1
Total		989

Earliest Priority Countries - "Site of Invention



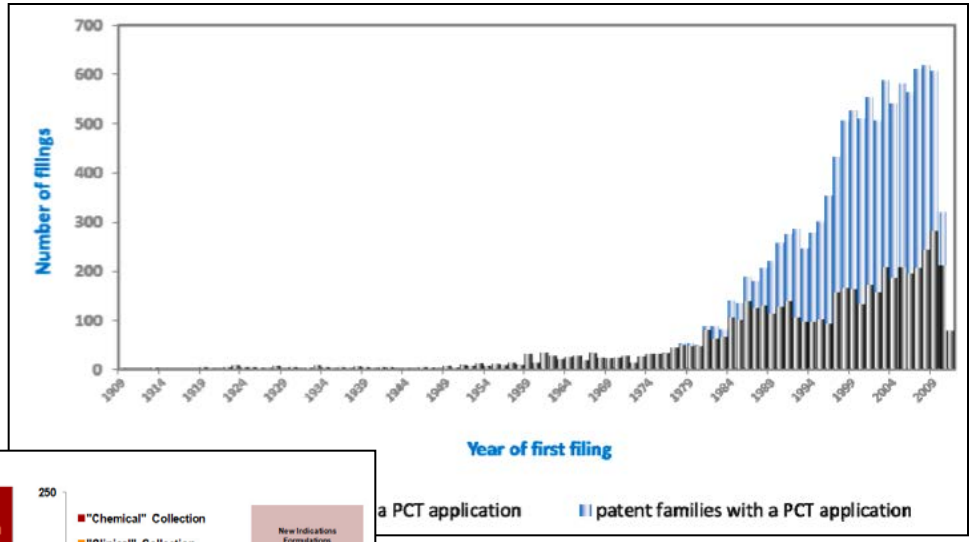
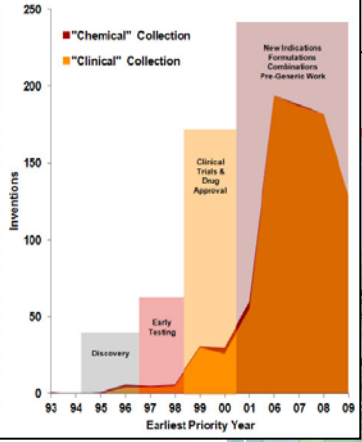
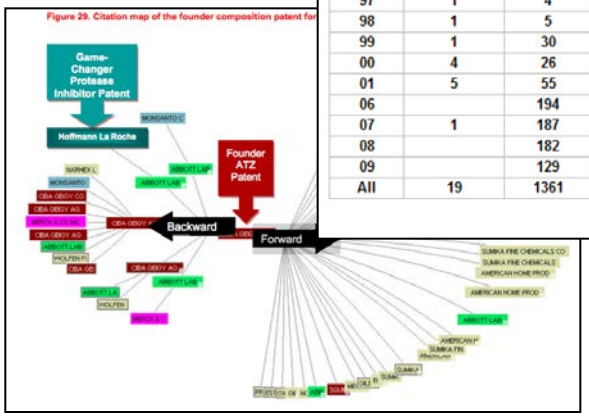
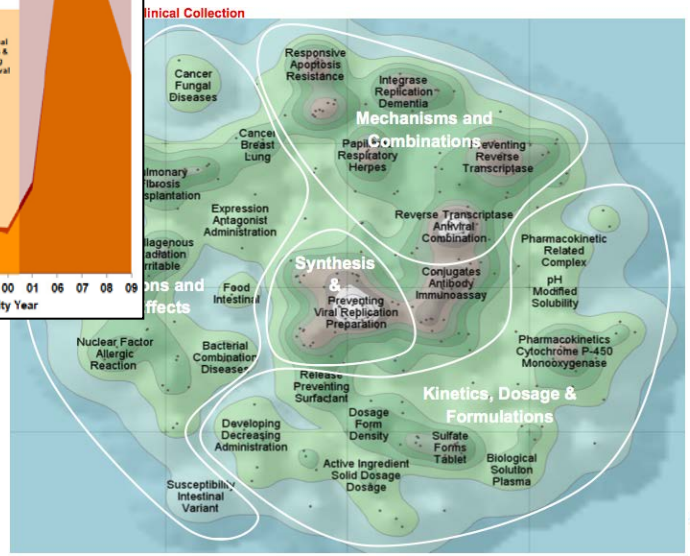


Figure 13. Invention Timelines vs Developmental Stages

Earliest Priority Year	"Chemical" Collection	"Clinical" Collection	Invention Families
93	1		1
94			
95	1		1
96	2	4	6
97	1	4	5
98	1	5	6
99	1	30	31
00	4	26	30
01	5	55	60
06		194	194
07	1	187	188
08		182	182
09		129	129
All	19	1361	1380







Examples

Visualization

- Facilitates the comprehension and the communication of the results of analysis
  - E.g. statistic tables can be illustrated by pie, bar, line charts

→ Topic 11

- Some output of analyses can hardly be separated from visualization
  - Network graphs
  - Concept maps

→ Topic 12
→ Topic 13

- Static visualizations (e.g. in PDF of report)
- Dynamic/interactive visualizations (e.g. on website)
- Various applications/tools
- Visualization may facilitate data cleaning (collaboration networks)

→ Topic 15, 16

Stages of PLR preparation

- Planning
- Tendering (if to be outsourced)
- Delivery/preparation
- Dissemination
- (use)
- Evaluation

→ Topic 10

WIPO Patent Landscape project

- PLRs perceived as important tool for access to and exploitation of patent information
  - Business use
  - Factual evidence for policy discussions and strategic planning
  - Technology transfer (FTO, public domain; e.g. extensions)
- WIPO Committee on Development and Intellectual Property (CDIP) created project DA_19_30_31 as part of WIPO's Development Agenda
  - Bridging the knowledge gap
  - Promoting the use of patent information as a freely accessible (no copyright protection!) and globally available resource for technology information

WIPO Patent Landscape project

Phase I (2010-11)

- Budget for 12 PLRs
- Diverse areas of technology to be covered
  - Health, food security, green technologies,….
- PLR should be "demand driven", addressing needs of developing countries
  - Need for competent cooperation partners
  - NGOs and IGOs as initial partners
- Developing a procedure for the preparation of PLRs → Topic 10
- Website for publishing PLRs and related information → Topic 14

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Collaboration with users

- WIPO has usually limited technical expertise in areas of technology
- Partners having needs and expertise are valuable for assuring
  - relevance of each report
  - efficiency of preparation
  - sufficient utilization of completed report (impact)

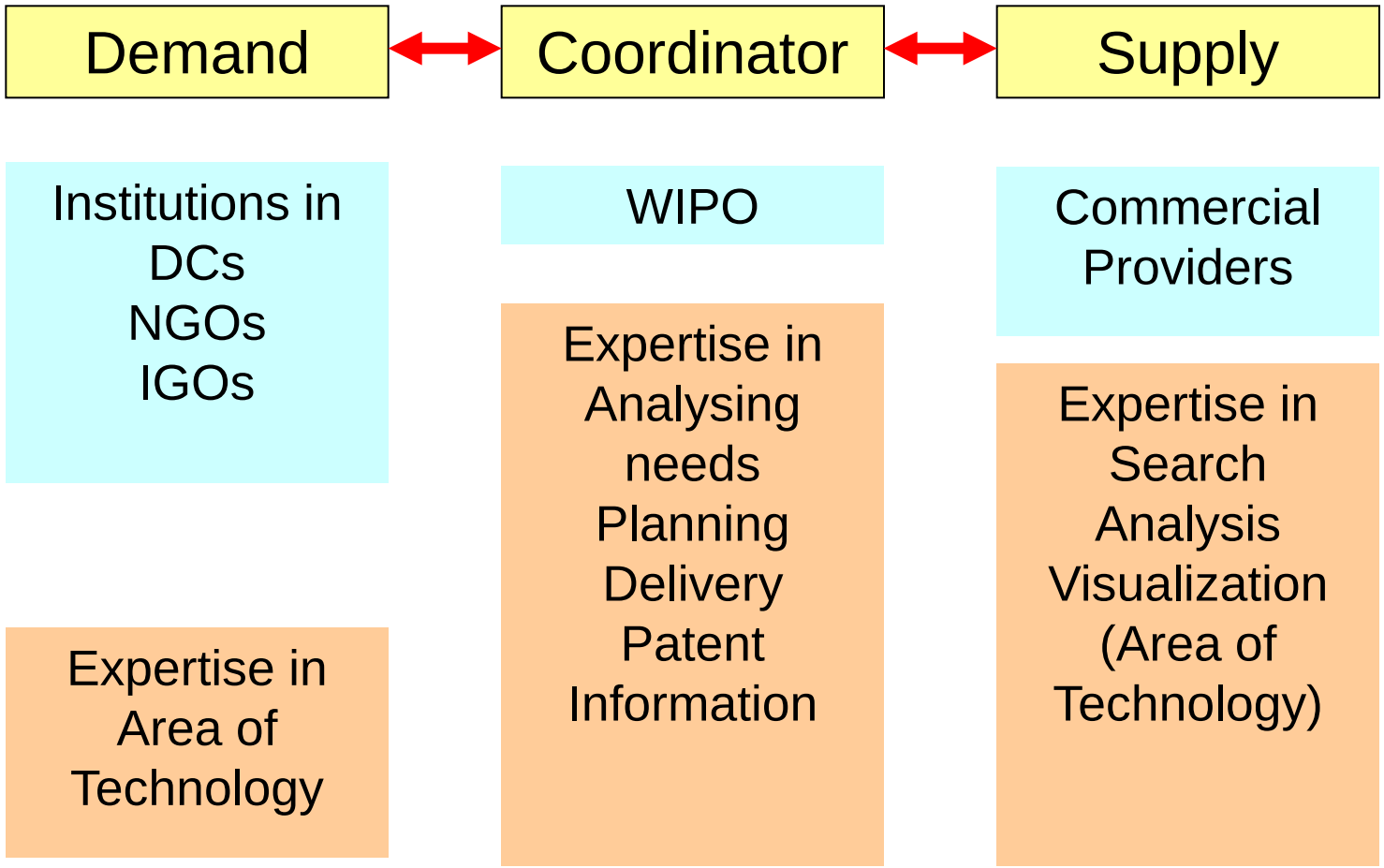
- Each collaboration serves for partners as vehicle/means to familiarize themselves with patent information, analytics, patent system (> capacity building)

- Collaboration covers several phases: drafting TOR, delivery phase, dissemination, evaluation of PLR

Outsourcing to providers

- WIPO has limited technical expertise in searching, analysis and visualization; and limited access to professional databases and tools
- PLRs were contracted out after tendering procedure according to WIPO's procurement rules

Matching needs



WIPO's patent landscape project

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Patent Landscape Reports

Patent landscape reports describe the patent situation for a specific technology in a given country, region or on the global level. They usually start with a state-of-the-art search for the technology of interest in suitable patent databases. The results of the search are then analyzed to answer specific questions, e.g. to identify certain patterns of patenting activity (Who is doing what? What is filed where?) or certain patterns of innovation (innovation trends, diversity of solutions for a technical problem, collaborations). An essential component of each patent landscape report is the visualization of these results in order to facilitate their understanding, and certain conclusions or recommendations based on the empirical evidence provided by the search and analysis.

Patent landscapes can therefore be useful for policy discussions, strategic research planning or technology transfer. However, they provide only a snapshot of the patenting situation at a certain point in time. In a wider sense, some patent landscapes reports may analyze the validity of patents by referring to legal status data, and thereby form a basis, e.g., for freedom to operate analysis.

WIPO's Patent Landscape Reports are based on the Development Agenda project "Developing Tools for Access to Patent Information". The project is described in document CDIP/4/6, adopted by the Committee on Development and Intellectual Property (CDIP) in 2009.

On-going Work at WIPO

WIPO has been mandated to prepare patent landscape reports in areas of particular interest to developing and least developed countries, such as public health, food security, climate change and environment. For that purpose, WIPO is developing in cooperation with interested external partners, such as institutions from member States, intergovernmental or non-governmental organizations, the scope of each report. The author of each report is selected in a tendering process based on specific terms of reference. List of on-going work.

Published Patent Landscape Reports

Patent landscape reports on various topics h
governmental organizations and private sect
request, either free of charge or for a fee. Co

FEATURE

Patent Landscape Report on Vaccines for Selected Diseases

LATEST NEWS

- Patent Landscape Report on Vaccines for
- Patent Landscape Report on Atazanavir (S
- Patent Landscape Report on Solar Coolin
- WIPO Magazine article (Issue 3/2012) on N

→ Topic 14, 17

Dedicated website

- Links to published reports
- Links to groups/institutions active in the field
- General background/information

http://www.wipo.int/patentscope/en/programs/patent_landscapes/index.html

Phase I work and collaborations

- UNITAID/**Medicines Patent Pool (MPP)**:

  Ritonavir (Landon IP)

  Atazanavir (Thomson)
- WHO: Vaccine manufacturing (FIST)
- DNDI: Patents related to 5 neglected diseases (Landon IP)
- FAO:

  Adaptation technologies for improving plant salinity tolerance (PIIPA)
- IRENA, GIWEH:

  Desalination technologies, and use of renewable energies for desalination (CambridgeIP)

  Water purification (CambridgeIP)
- (no partner):

  Solar cooling (IP Search); Solar cooking (Scope)

WIPO Patent Landscape project

- Evaluation after Phase I
- **Phase II** (2012-13)
  - Budget for 6 further PLRs
  - Enhancing capacity building
    - **Manual/Guidelines for best practices**
    - **Regional Workshops for exchange of best practices**
  - Refining standardized tools/procedures of Phase I and developing into future standard service

Phase 2 work and collaborations

- CERN

  Industrial applications of accelerator technologies (Scope)
- UNEP/Basel Convention:

  Electronic waste management (Thomson)
- FAO:

  - Abiotic stress tolerance of plants, as extension of the plant salinity tolerance PLR (PIIPA)

  - Animal genetic resources (Paul Oldham)
- WHO

  - update of Ritonavir PLR (Landon IP)

  - update of neglected diseases PLR (Landon IP)

Utility of a WIPO PLR

- Thematic dimension:
  - **Factual evidence**: raw and analyzed data
  - Enables/provides conclusions, recommendations, answers specific business questions
  - **Visualization** facilitates comprehension

See variety of following samples

- Training dimension:
  - Develops and describes search methodology in particular area of technology
  - Capacity building for partners

We welcome proposals for collaboration in 2014

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Ritonavir

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Ritonavir patent landscape report

- Ritonavir is an essential medicine for the treatment of HIV (protease inhibitor)
- WHO list of **Essential Medicines** includes Ritonavir
- Developed by Abbott Laboratories
- First patent application WO1994014436
- To expire in 2013; relevance as generica
- Marketed as Norvir and Kaletra (combination with Lopinavir, another protease inhibitor)
- PLR prepared by Landon IP (search 6.3.2011)
- Recent update (reloading previous search query)

Objectives of Ritonavir report

- Identify **all** patents **claiming** an invention related to the active ingredient (synthesis, combinations, applications,..)
- Analysis of patenting activity
- Identify sample **innovation tracks**, subsequent generations of patents claiming subsequent improvements, new inventions (“evergreening”)
- Detailed description of search methodology for pharmaceuticals
  - Combination of keyword/classification search and CAS registry/structure searches
- Intellectual screening for
  - Eliminating noise (irrelevant patents)
  - Categorization of patents (synthesis, formulations, therapeutic use, prodrugs,..)

Sample of individual report website

Patent Landscape Report on Ritonavir

Ritonavir is an antiretroviral drug from the protease inhibitor class used to treat HIV infection and AIDS. Ritonavir is included in the WHO Model List of Essential Medicines.

A major goal of this report is to highlight the technology timeline for Ritonavir from the first filing of this compound in July 1994 by Abbott Laboratories (WO1994014426) to the present filings in which additional patent families attempt to protect subsequent innovations to the compound, variants and derivatives, combinations with other chemicals, methods of production, methods of use, etc. The analysis of the researched patent documents showed that filings related to Ritonavir have increased dramatically since the initial disclosure and now include over 800 patent families.

This report identifies a number of innovation tracks that spun-off of the first Ritonavir patent document, WO1994014426. They are related to liquid dosage formulations, solid dosage formulations, synthesis of Ritonavir and its key intermediates, polymorphs and crystalline Ritonavir, as well as prodrugs of Ritonavir. These innovation tracks illustrate the continuation of important protection related to Ritonavir as subsequent generations of patents continue to narrow the scope of protection while still maintaining protection from the first Ritonavir patent, a phenomenon that is also sometimes termed "evergreening".

The reports also includes an analysis of statistical trends, e.g. 45% of the patent families have a patent grant as family member, and 90% of the families include a PCT application.

A comprehensive explanation of the search methodology and history (including all search queries), and of the evaluation of the search results is included and illustrates how patent information can be retrieved and exploited in the area of pharmaceuticals.

The searchable and sortable patent database includes all 805 patent families, relevant bibliographic data and some added information, e.g. whether the family relates to prodrugs. Each family is linked to the Espacenet database of the European Patent Office which enables verification of the INPADOC family information and related legal status of family members. The database is complemented by a visualization of various statistical analyses of the collection of 805 patent families.

For further information please contact us.

Patent Landscape Report on Ritonavir

Download

- Full Report
- Executive Summary
- Database of Patent Families
- Interactive Anlaysis Tool
- Appendices - Innovation Tracks:
  - Liquid oral dosage forms
  - Synthesis of Ritonavir
  - Structural Considerations and Polymorphs
  - Solid Dosage Forms

Three standard components:

Report body (.PDF)

Database (.xls)

Interactive visualization (Intellixir)

Ritonavir patent landscape report

- **2011 PLR**: 823 patent families claiming Ritonavir related inventions according to claim language
  - Many more potentially relevant IP rights in comparison to Orange book of US FDA
  - To be taken into account in case of technology transfer, local production, procurement through generics: licensing key patent is not enough
- **Update**
  - 344 net new families since 6.3.2011
  - 38 identified only through CAS registry and structure search
  - 335 previously identified families had new members (e.g. grants, applications; corrections or search reports not counted)

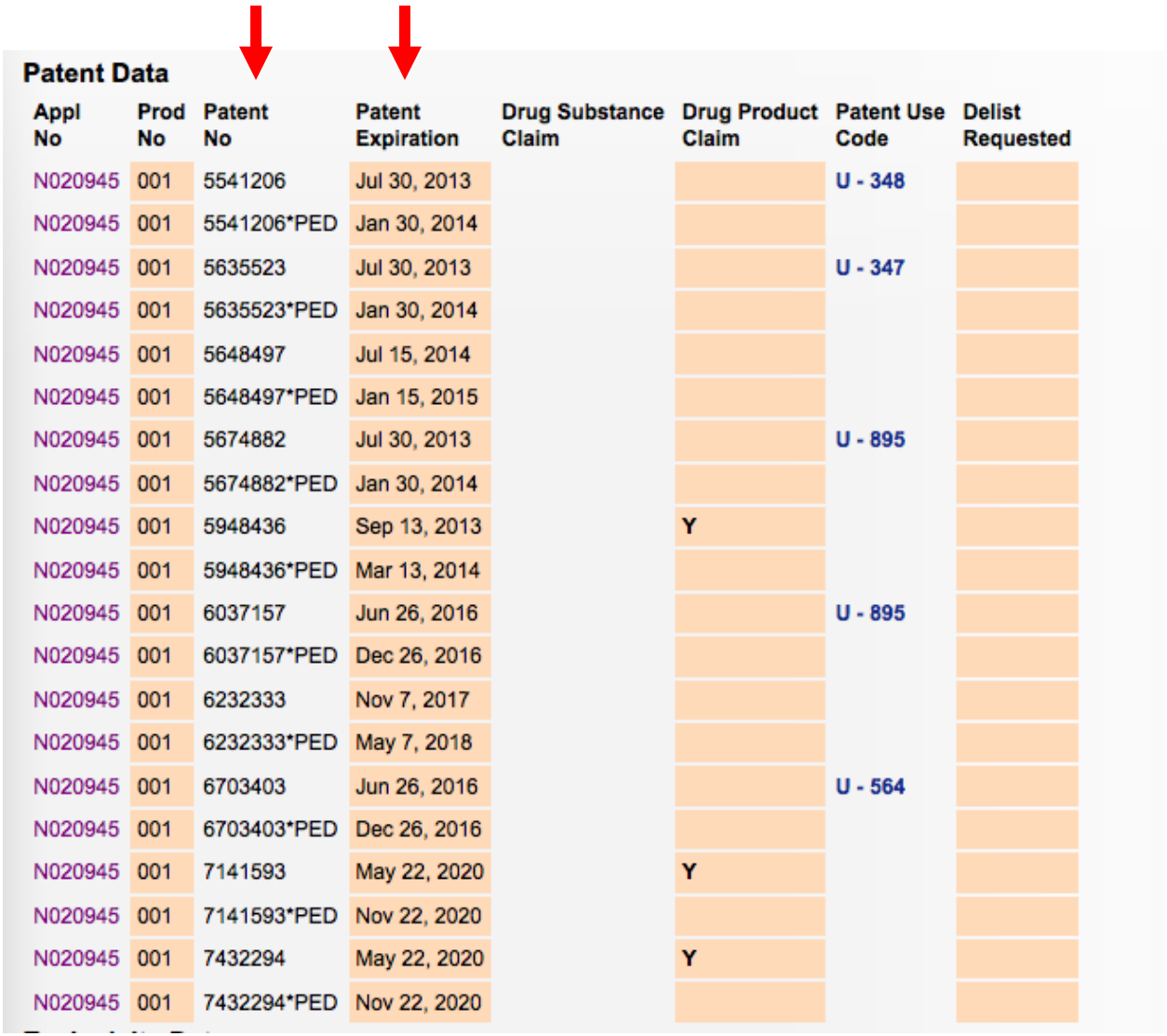
Database of Ritonavir related patents

Publication number linked to Espacenet; sortable

Technology categories; sortable

	A	B	C	D	E	F	G	H	I	J
1	Hyperlinked Publicat	Title	Priority Document	Earliest Priority Date	Assignee / Applicant	Inventor(s)	Family Members	Family Size	Combinations	Prodrug
2	WO2010151495	MATERIALS AND METHODS FOR TREATING AND PREVENTING VIF	US20090220920P	2009-06-26	UNIVERSITY OF FLORIDA RESEA	JOHNSON HOWARD M US | /	None	1	Yes	
3	WO2010150100	THE USE OF SPINOSYNS AND SPINOSYN COMPOSITIONS AGAINS	US20090220059P	2009-06-24	ENTARCO SA	KRITIKOU CHRISTINE GR | SA	None	1	Yes	Yes
4	WO2010148323	DIAGNOSIS AND TREATMENT OF DISEASES OR DISORDERS ASSOC	US20090268933P	2009-06-18	WHITTEMORE PETERSON INSTI	MIKOVITS JUDY A US | LOMB	WO2010148323A3 | US2010167268A1	4		
5	WO2010148006	HEPATITIS C VIRUS INHIBITORS	US20090187374P	2009-06-16	ENANTA PHARM INC	OR YAT SUN US | PENG XIAO'	US2011008288A1 | US2010316607A1	3	Yes	Yes
6	WO2010144869	PROTEASE INHIBITORS	US20090186768P	2009-06-12	NEKTAR THERAPEUTICS	RIGGS-SAUTHIER JENNIFER U	WO2010144869A3	1		Yes
7	WO2010143207	TASTE-MASKED ORAL FORMULATIONS OF INFLUENZA ANTIVIRAL	IN2009MU01405	2009-06-11	RUBICON RESEARCH PRIVATE LI	PILGAONKAR PRATIBHA SUDHII	None	1	Yes	Yes
8	WO2010132664	COMPOSITIONS AND METHODS FOR DRUG DELIVERY	US20090467230	2009-05-15	BAXTER INTERNATIONAL INC.	RABINOW BARRETT US | BAI	US2010290983A1	2		
9	WO2010132663	PEGYLATED AZAPEPTIDE DERIVATIVES AS HIV PROTEASE INHIBITC	US20090216086P	2009-05-13	CONCERT PHARMACEUTICALS I	HARBESON SCOTT L US | TUI	None	1	Yes	
10	WO2010132511	METHODS OF REDUCING THE RISK OF DRONEDARONE USE IN CE	US20090177409P	2009-05-12	SANOFI	SCARAZZINI LINDA US	US2010320099A1	2	Yes	
11	WO2010132494	COMPOUNDS AND METHODS FOR TREATING AIDS AND HIV INFE	US20090177086P	2009-05-11	GHOSH ARUN K	GHOSH ARUN K US	None	1	Yes	
12	WO2010132163	MACROCYCLIC COMPOUNDS AS HEPATITIS C VIRUS INHIBITORS	US20090177853P	2009-05-13	ENANTA PHARM INC	GAI YONGHUA US | OR YAT S	US2011033420A1	2	Yes	Yes
13	WO2010127272	HYDROXYETHYLAMINO SULFONAMIDE DERIVATIVES	US20090214977P	2009-04-30	CONCERT PHARMACEUTICALS I	HARBESON SCOTT L US | TUI	US2010305173A1	2	Yes	
14	WO2010127099	PHARMACEUTICAL COMPOSITIONS COMPRISING EPA AND A CAF	US20090173759P	2009-04-29	AMARIN CORP PLC	MANKU MEHAR GB | ROWE	None	1	Yes	Yes
15	WO2010122087	METHODS FOR IMPROVING PHARMACOKINETICS	US20090172722P	2009-04-25	F. HOFFMANN-LA ROCHE AG	TRAN JONATHAN Q US	US2010272682A1	2	Yes	
16	WO2010121351	USE OF (HEXENOYL TRANS-3)HGRF(1-44)NH2 AND RITONAVIR IN	US20090170862P	2009-04-20	THERATECHNOLOGIES INC	MARSOLAIS CHRISTIAN CA	US2010267635A1 | WO2010121351A8	2		
17	WO2010116248	ORGANIC COMPOUNDS AND THEIR USES	US20090168408P	2009-04-10	NOVARTIS AG	BRANDL TRIXI CH | RAMAN F	UY32551A | US2010260709A1	3	Yes	Yes
18	WO2010115981	7-AZADISPIRO [3.0.4.1] DECANE-8-CARBOXAMIDES AS HEPATITIS	US20090168415P	2009-04-10	NOVARTIS AG	BRANDL TRIXI CH | RAMAN F	UY32554A	3	Yes	Yes
19	WO2010111238	IMPROVED BIODEGRADABLE POLYMERS	US20090162653P	2009-03-23	MICELL TECHNOLOGIES INC	TAYLOR DOUGLAS US | MCCL	WO2010111238A3 | US2010256746A1	2		Yes
20	WO2010107831	NANOCARRIER COMPOSITIONS AND METHODS	US20090160575P	2009-03-16	RUTGERS, THE STATE UNIVERSI	SINKO PATRICK J US | STEIN S	None	1		Yes
21	WO2010100381	NOVEL ANTIVIRAL AGENT	FR20090051347	2009-03-04	CENTRE NATIONAL DE LA RECH	CHABRIERE ERIC FR | ELIAS N	FR2942717A1 | FR2942717B1	2	Yes	
22	WO2010099527	HEPATITIS C VIRUS INHIBITORS	US20090156131P	2009-02-27	ENANTA PHARM INC	QIU YAO-LING US | CE WANG	US2010260715A1 | US2010233122A1	3	Yes	Yes
23	WO2010099458	COMBINATION OF A NUCLEOSIDE POLYMERASE INHIBITOR WITH	US20090156414P	2009-02-27	INTERMUNE INC | F. HOFFMAN	PORTER STEVEN B US | BRAD	US2010221217A1	3	Yes	Yes
24	WO2010096462	LINKED DIIMIDAZOLE DERIVATIVES	US20090153234P	2009-02-17	ENANTA PHARM INC	OR YAT SUN US | PENG XIAO'	US2010226883A1 | US2010221216A1 | US2010	4	Yes	Yes
25	WO2010091413	LINKED DIBENZIMIDAZOLE DERIVATIVES	US20090151079P	2009-02-09	ENANTA PHARM INC	QIU YAO-LING US | WANG CE	US2010221215A1 | US2010266543A1 | US2010	4	Yes	Yes
26	WO2010089767	DUAL RELEASE PHARMACEUTICAL SUSPENSION	IN2009DE00030	2009-01-09	PANACEA BIOTEC LTD	JAIN RAJESH IN | SINGH SUKI	None	1		
27	WO2010089763	POLY(N-VINYL CAPROLACTAM-CO-ACRYLAMIDE) MICROPARTICLE	IN2008MU01366	2008-06-30	RELIANCE LIFE SCIENCES PVT LT	VADDE RAMESH BABU IN | R	WO2010089763A3	1		
28	WO2010086844	POLYMORPHS OF DARUNAVIR	US20090148055P	2009-01-29	MAPI PHARMA HK LTD	MAROM EHUD IL	None	1	Yes	
29	WO2010077740	NOVEL ANTIVIRAL COMPOUNDS, COMPOSITIONS, AND METHOD	US20080120948P	2008-12-09	CYTOKINE PHARMASCIENCES IN	SIELECKI-DZURDZ THAIS M US	WO2010077740A3	1	Yes	Yes
30	WO2010077734	NOVEL ANTIVIRAL COMPOUNDS, COMPOSITIONS, AND METHOD	US20080120939P	2008-12-09	CYTOKINE PHARMASCIENCES IN	SIELECKI-DZURDZ THAIS M US	WO2010077734A3	1	Yes	Yes
31	WO2010077317	PROTEASE INHIBITORS	US20080138428P	2008-12-17	AMPLYX PHARMACEUTICALS IN	MUTZ MITCHELL US | BARR K	WO2010077317A3	1	Yes	Yes
32	WO2010077061	PHARMACEUTICAL FORMULATIONS CONTAINING ANTIVIRAL DRU	US20080141983P	2008-12-31	HANALL BIOPHARMA CO., LTD	KIM SUNG WUK KR | JUN SU	WO2010077061A3	1		
33	WO2010075065	METHODS FOR ENHANCING THE RELEASE AND ABSORPTION OF	US20080122497P	2008-12-15	BANNER PHARMACAPS INC	FATMI AQEEL US | KIM TAE K	US2011052682A1	3		
34	WO2010068899	NANOPARTICLES COMPRISING COMBINATIONS OF ANTIRETROVI	US20080122139P	2008-12-12	CREIGHTON UNIVERSITY	DESTACHE CHRISTOPHER J US	None	1		
35	WO2010065118	ANTI-INFLAMMATORY COMPOSITIONS AND METHODS	US20080315508 | US2008	2008-12-02	SEARETE LLC	HYDE RODERICK A US | MAL	US2010136094A1 | US2010137246A1 | US2010	13	Yes	
36	WO2010065079	ANTIBODIES TO IL-6 AND USE THEREOF	US20060801412P	2006-05-19	ALDER BIOPHARMACEUTICALS	GARCIA-MARTINEZ LEON US	AR074227A1 | US2009291089A1 | JP2010527615	57	Yes	
37	WO2010059883	DEGRADABLE HYDROGEL COMPOSITIONS AND METHODS	US20080115962P	2008-11-19	RUTGERS, THE STATE UNIVERSI	SINKO PATRICK JOHN US | DE	None	1		Yes
38	WO2010057048	THERAPIES FOR HEMATOLOGIC MALIGNANCIES	US20080114434P	2008-11-13	CALISTOGA PHARMACEUTICALS	GALLATIN MICHAEL W US | U	US2010202963A1	4	Yes	Yes
39	WO2010047819	HYDROXYETHYLAMINO SULFONAMIDE DERIVATIVES	US20080197190P	2008-10-24	CONCERT PHARMACEUTICALS I	HARBESON SCOTT L US | MA	WO2010047819A8	1	Yes	
40	WO2010045266	THERAPEUTIC ANTIVIRAL PEPTIDES	US20080105746P	2008-10-15	INTERMUNE INC	SEIWERT SCOTT US | BEIGELI	AR073880A1 | US2010119479A1	5	Yes	Yes
41	WO2010041241	HIV-1 INTEGRASE DERIVED PEPTIDES AND COMPOSITIONS	US20080103036P	2008-10-06	YISSUM RESEARCH DEVELOPMI	LEVIN AVIAD IL | HAYOUKA Z	WO2010041241A3	2	Yes	
42	WO2010038237	COMPOSITIONS EXHIBITING DELAYED TRANSIT THROUGH THE GA	IN2008MU02020	2008-09-22	RUBICON RESEARCH PRIVATE LI	PILGAONKAR PRATIBHA SUDHII	WO2010038237A3	3		Yes
43	WO2010037566	IMPROVED NANOPARTICULATE COMPOSITIONS OF POORLY SOLU	EP20080165747	2008-10-02	CAPSULUTION PHARMA AG	GONZALES FERREIRO MARIA	EP2172193A1	4		
44	WO2010037402	MOLECULAR VACCINES FOR INFECTIOUS DISEASE	DK20080001384 | US2008	2008-10-02	DAKO DENMARK A/S	SCHOELLER JOERGEN DK | PE	None	1		
45	WO2010033637	DISSOLUTION OF ARTERIAL PLAQUE	US20050739143P	2005-11-22	Z & Z MEDICAL HOLDINGS, INC	ZADINI FILIBERTO US | ZADIN	WO2007084549A3 | US2007249543A1 | US2008	11		
46	WO2010033614	STABLE SOLID ORAL DOSAGE CO-FORMULATIONS	US20080097479P	2008-09-16	SEQUOIA PHARMACEUTICALS	LUDTKE DOUGLAS US | DAG	None	4		
47	WO2010017432	PHARMACEUTICAL FORMULATIONS OF AN HCV PROTEASE INHIB	US20080086997P	2008-08-07	SCHERING CORP	SHETH ASHLESH US | HU CHE	CA2732777A1 | AR072991A1 | AU2009279520A	5	Yes	
48	WO2010014130	COMPOSITION AND METHOD TO PREVENT OR REDUCE DIARRHE	US20080152520	2008-07-28	DIGESTIVE CARE INC	SIPOS TIBOR US | DAS SIMAN	US2010021505A1	2		
49	WO2010012466	ANTITUMOR PROPERTIES OF NO MODIFIED PROTEASE INHIBITOI	US20080085555P	2008-08-01	GANIAL IMMUNOTERAPEUTICS	NICOLETTI FERDINANDO IT |	WO2010005770A8 | WO2010005637A3 | US200	4		
50	WO2010009335	DRUG DELIVERY MEDICAL DEVICE	US20080081691P	2008-07-17	MICELL TECHNOLOGIES INC	MCCLAIN JAMES B US | TAYL	WO2010121187A2 | WO2011009096A1 | US201	14	Yes	Yes
51	WO2010000459	CYCLOPROPYL POLYMERASE INHIBITORS	EP20080159396	2008-07-01	CENTOCOR ORTHO BIOTECH IN	JONCKERS TIM HUGO MARIA	AP2010055050 | UY31950A | EP2141172A1 | I	10	Yes	

Orange book: US patents on Ritonavir



Patent Data

Appl No	Prod No	Patent No	Patent Expiration	Drug Substance Claim	Drug Product Claim	Patent Use Code	Delist Requested
N020945	001	5541206	Jul 30, 2013			U - 348	
N020945	001	5541206*PED	Jan 30, 2014				
N020945	001	5635523	Jul 30, 2013			U - 347	
N020945	001	5635523*PED	Jan 30, 2014				
N020945	001	5648497	Jul 15, 2014				
N020945	001	5648497*PED	Jan 15, 2015				
N020945	001	5674882	Jul 30, 2013			U - 895	
N020945	001	5674882*PED	Jan 30, 2014				
N020945	001	5948436	Sep 13, 2013		Y		
N020945	001	5948436*PED	Mar 13, 2014				
N020945	001	6037157	Jun 26, 2016			U - 895	
N020945	001	6037157*PED	Dec 26, 2016				
N020945	001	6232333	Nov 7, 2017				
N020945	001	6232333*PED	May 7, 2018				
N020945	001	6703403	Jun 26, 2016			U - 564	
N020945	001	6703403*PED	Dec 26, 2016				
N020945	001	7141593	May 22, 2020		Y		
N020945	001	7141593*PED	Nov 22, 2020				
N020945	001	7432294	May 22, 2020		Y		
N020945	001	7432294*PED	Nov 22, 2020				

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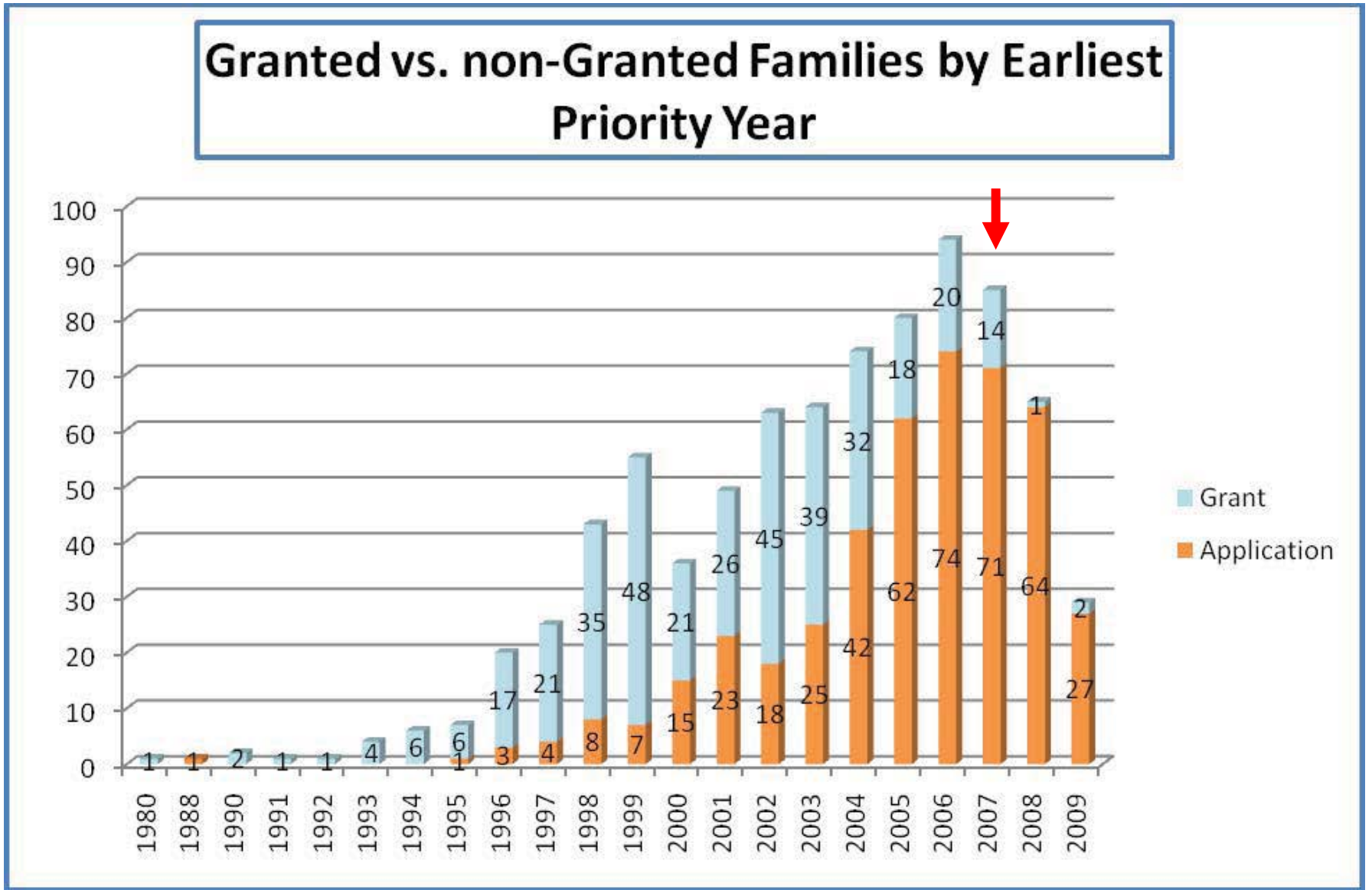
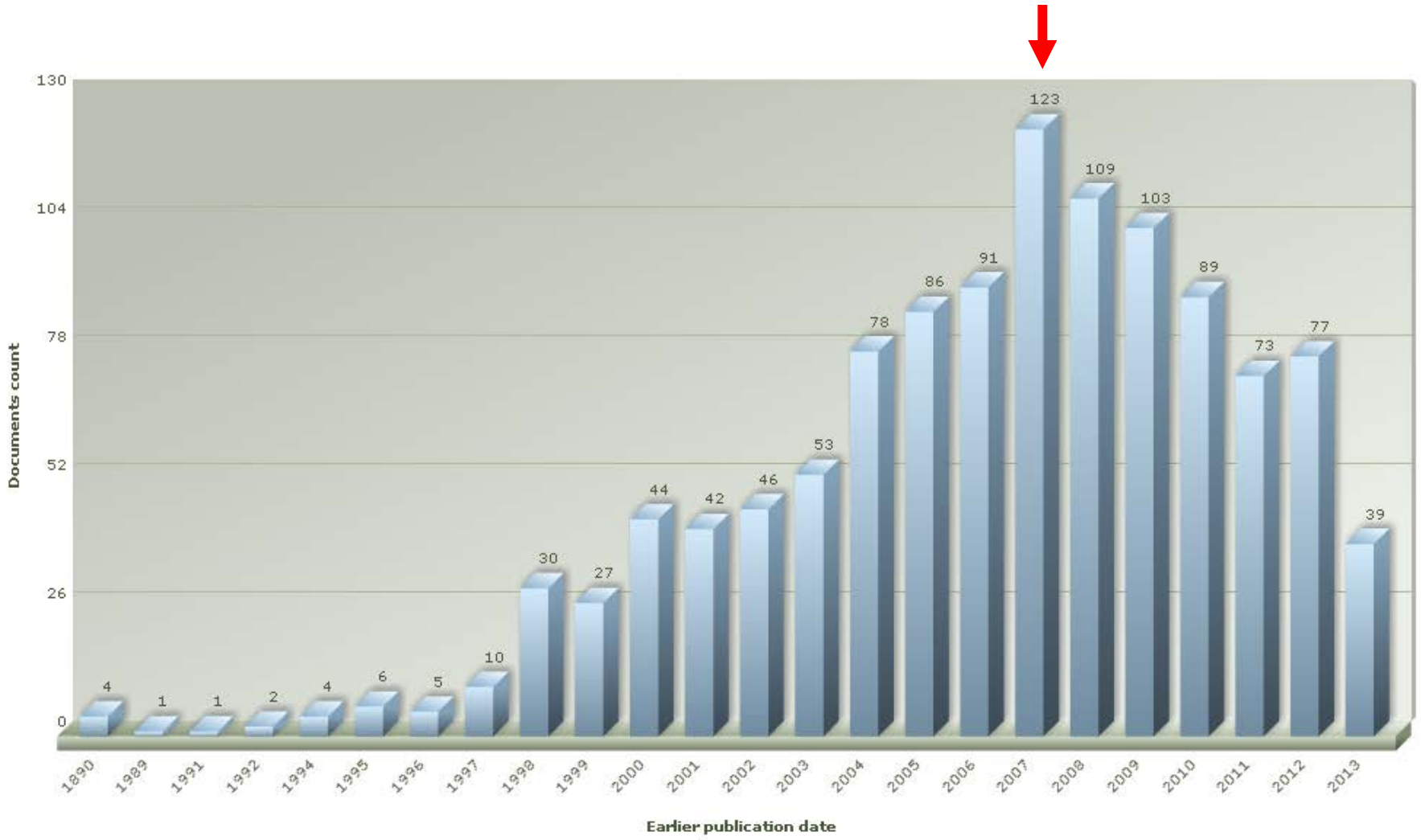
Ritonavir patent landscape report

- Average 13.4 jurisdictions per INPADOC family
- Largest patenting activity in combination therapies (400 families)
- Update reveals:
  - Peak of patenting activity in 2007
  - Discontinued activities of some previously active applicants (Tibotec)
  - Continuous activity of Abbott
  - Emerging activity of Enanta
  - Most activity still in combination therapies; ceased activity in prodrugs
  - Indian filing almost doubled (23 additional versus 29 up to 2011)

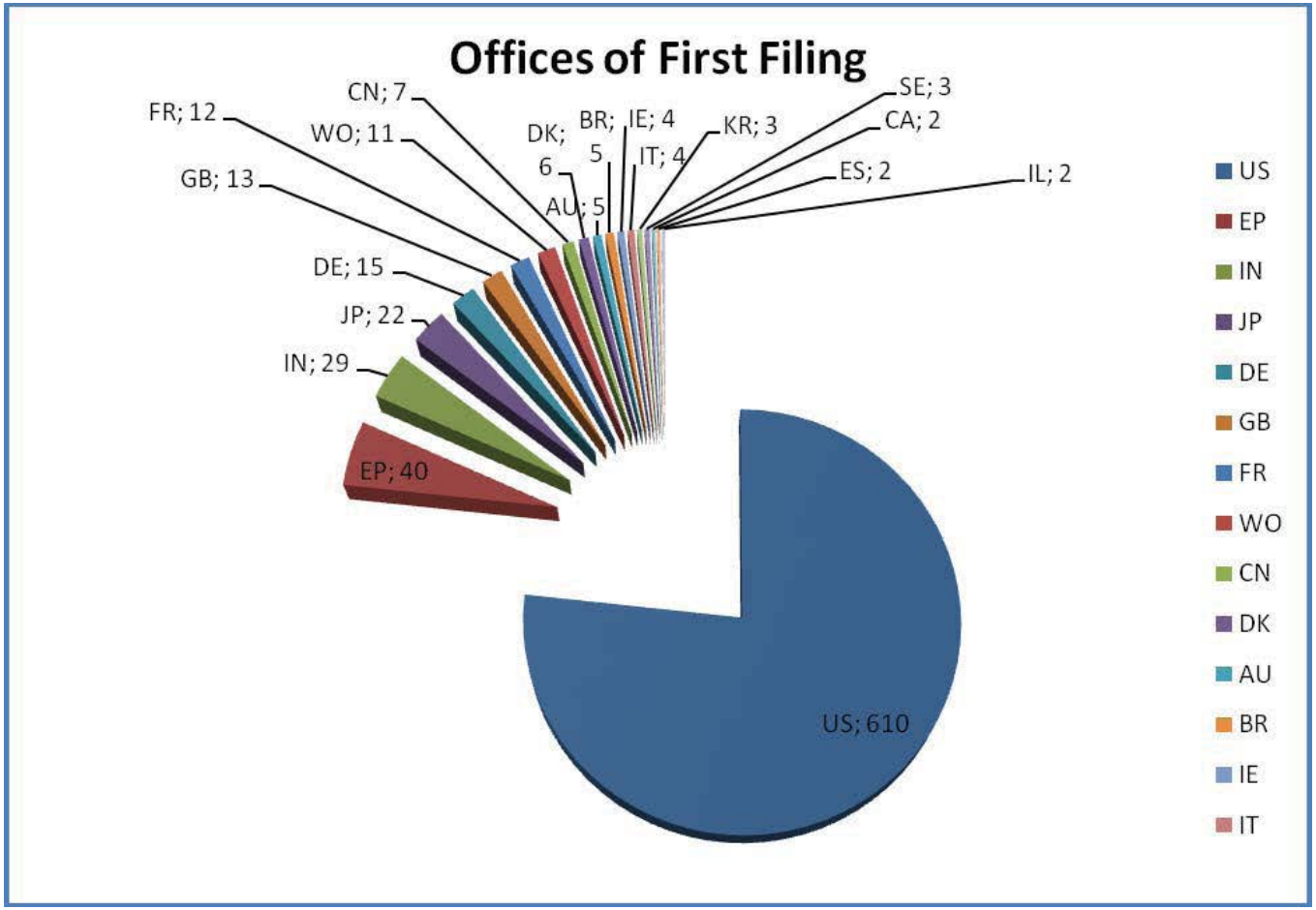
Ritonavir families/prio year (2011)



Ritonavir families/prio year (update)



Ritonavir – priority countries



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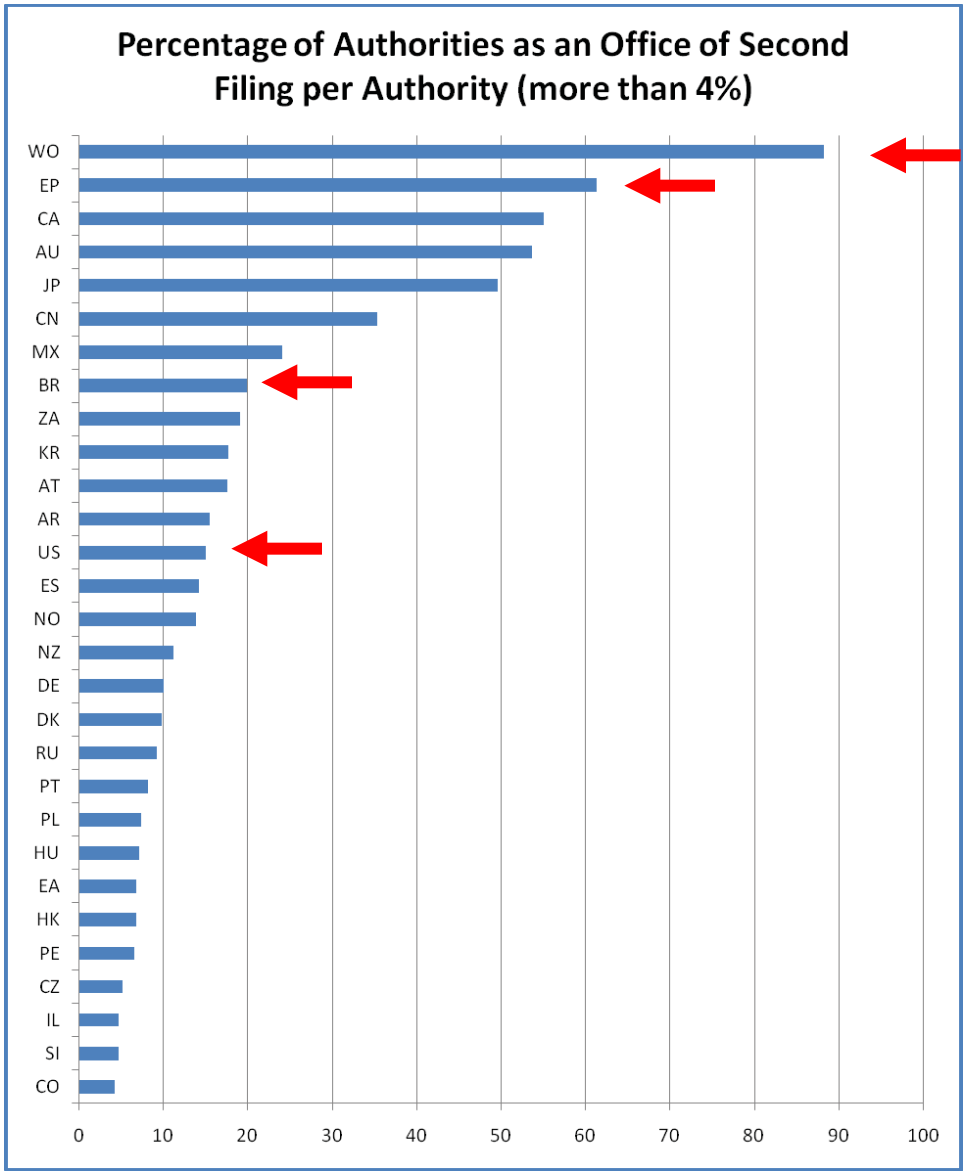
Ritonavir – extensions (OSF)



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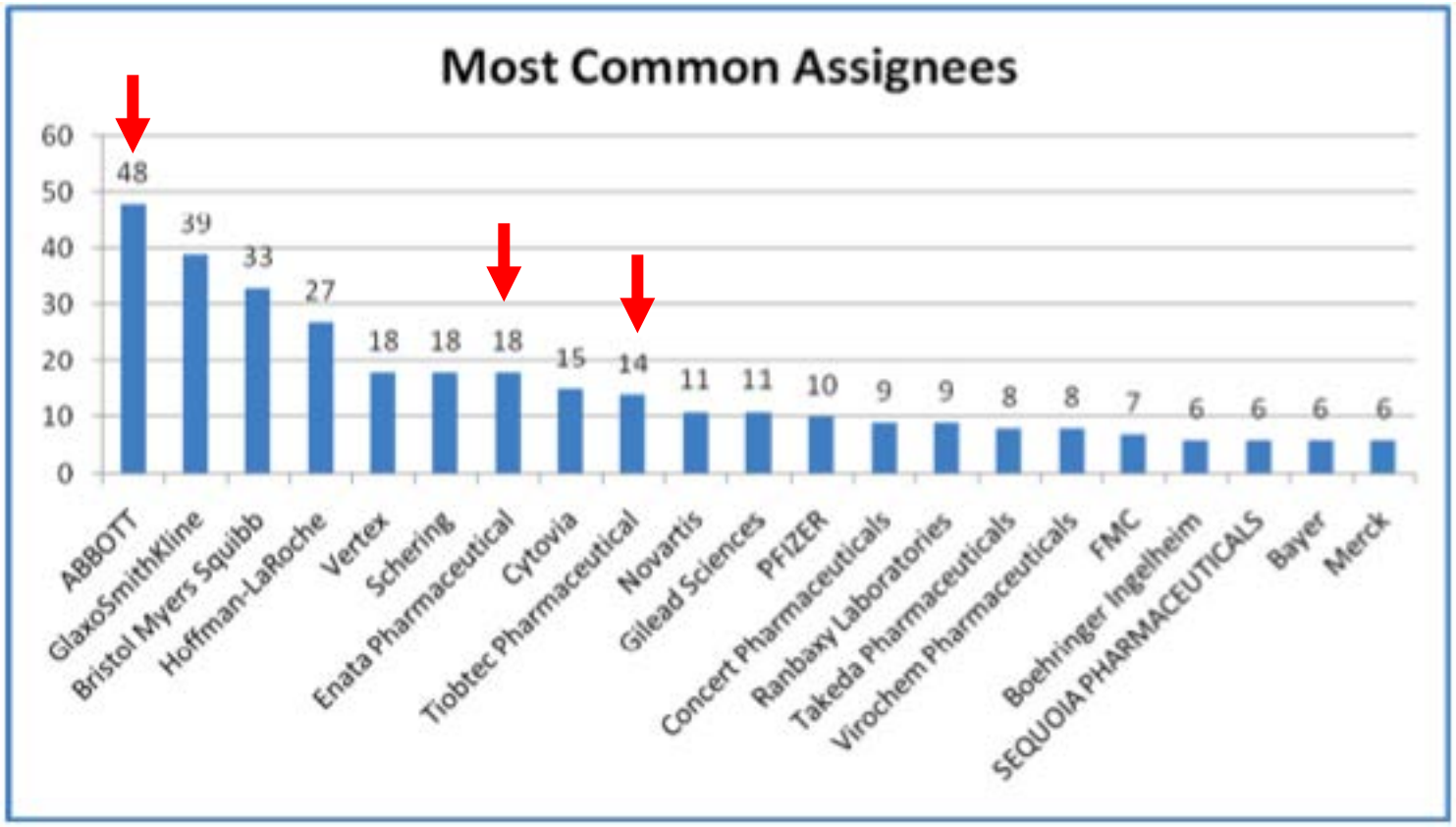
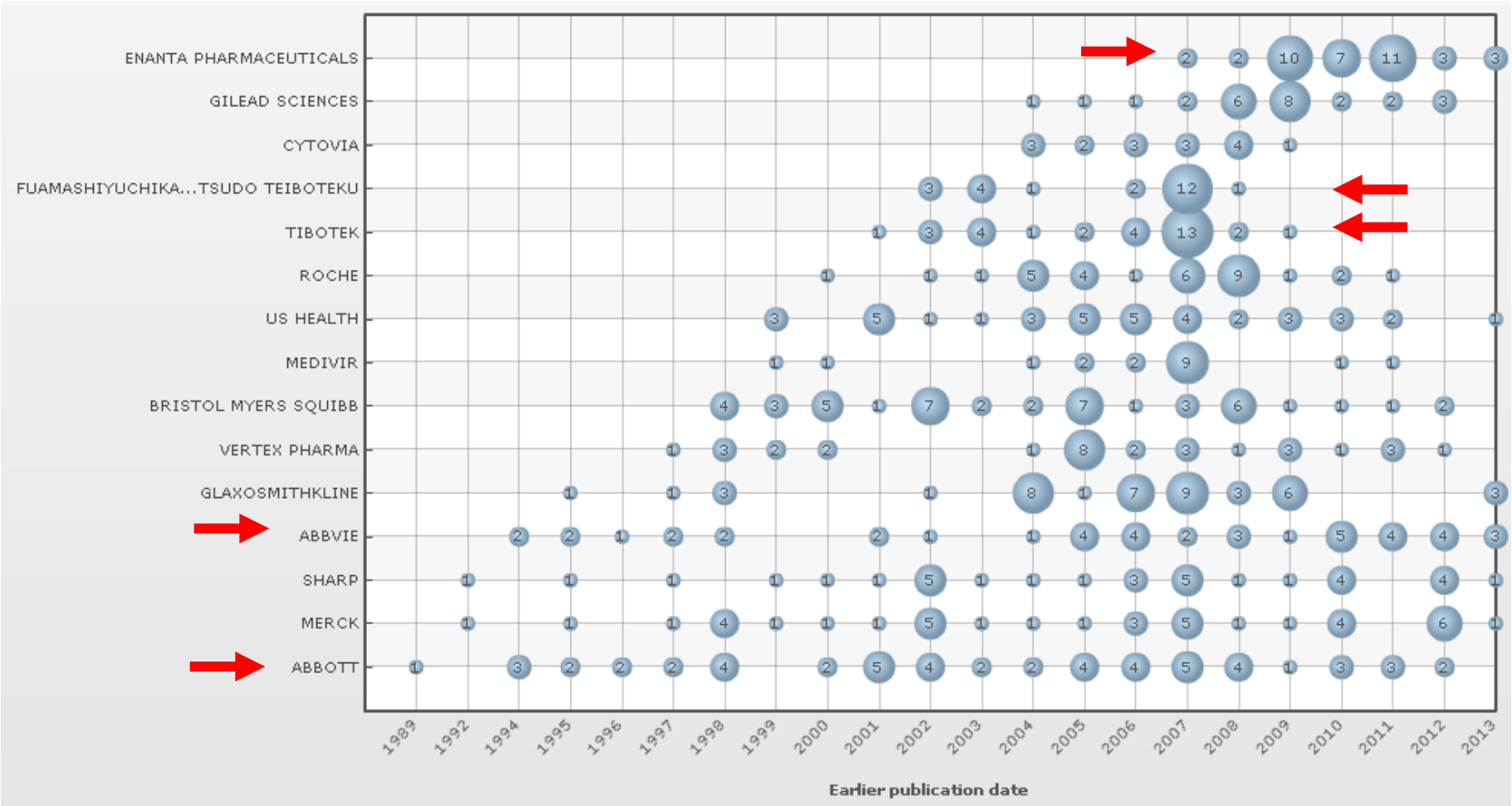
Top assignees (2011)



Assignee timeline (update)



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Top inventors (2011)

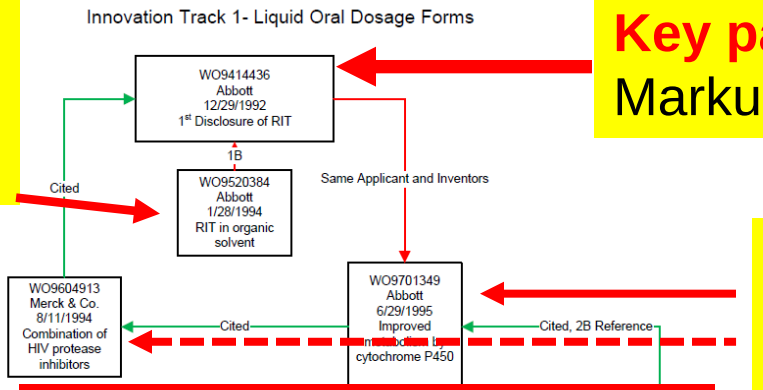
Common Inventors	Assignee	Count of Inventor
Or, Yat, Sun	Ranbaxy, Enanta	18
Cai, Sui Xiong	Cytovia	13
Kempf, Dale J.	Abbott	13
Zhe, Wang	Enanta	12
De Kock, Herman Augustinus	Tibotec	11
Sirisoma, Nilantha Sudath	Cytovia	10
Gudmundsson, Kristjan	GSK	10
Sweeney, Zachary Kevin	Hoffman-LaRoche	10
Seepersaud, Mohindra	Novartis	9
Aquino, Christopher, Joseph	GSK	9
Simmen, Kenneth Alan	Tibotec	9
Raboisson, Pierre Jean Marie Bernard	Tibotec Pharm	9
Raman, Prakash	Novartis	9
Kazmierski, Wielsaw Mieczyslaw	GSK	9
Grand Total		138

Innovation tracks

- Sometimes key inventions take place,
  - e.g. pharmaceutical substances
- They trigger series of further developments
  - e.g. combinations/formulations, synthesis,....
- Starting point of subsequent generations of related patents protecting further innovations
- Such later patents perpetuate protection beyond the 20 years after the filing of the initial patent
- I.e. certain technologies using the initial invention may still be protected though protection of first invention may have expired

Innovation tracks liquid dosage

2nd generation
1st liquid dosage
no 3rd generation



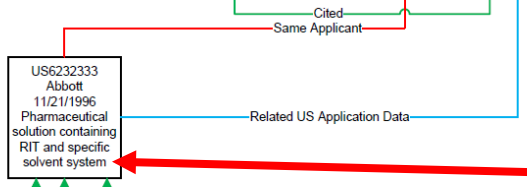
Key patent:
Markush formula

2nd generation
Combination
Potentially liquid

Topic 12
Network analysis

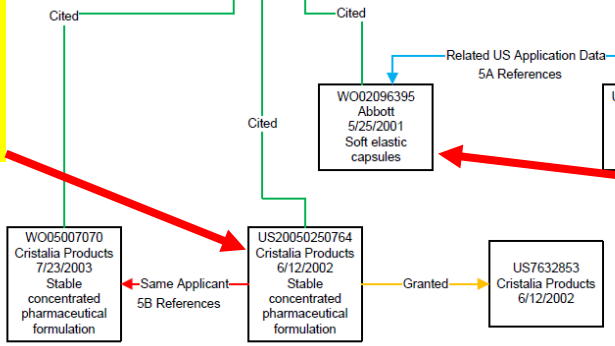
3rd generation
Liquid dosage

3d generation
Potentially liquid



4th generation
Liquid dosage

5th generation
More specific
liquid dosage



5th generation
Capsule for lq. Dos.

Atazanavir patent landscape report

- Atazanavir is, like Ritonavir, an **essential medicine** for the treatment of HIV (protease inhibitor)
- Developed by Novartis (then CIBA-GEIGY)
- 1995: first patent application
- 2003: approval for HIV treatment

- TOR almost identical to TOR for Ritonavir, same objectives
- Tendered at same time, intentionally created competitive situation; selected different provider: Thomson
- Result: Very different report not just in layout

Atazanavir patent landscape report

- 1380 patent families claiming Atazanvir related inventions according to claim language
  - Again many more potentially relevant IP rights in comparison to Orange book of US FDA

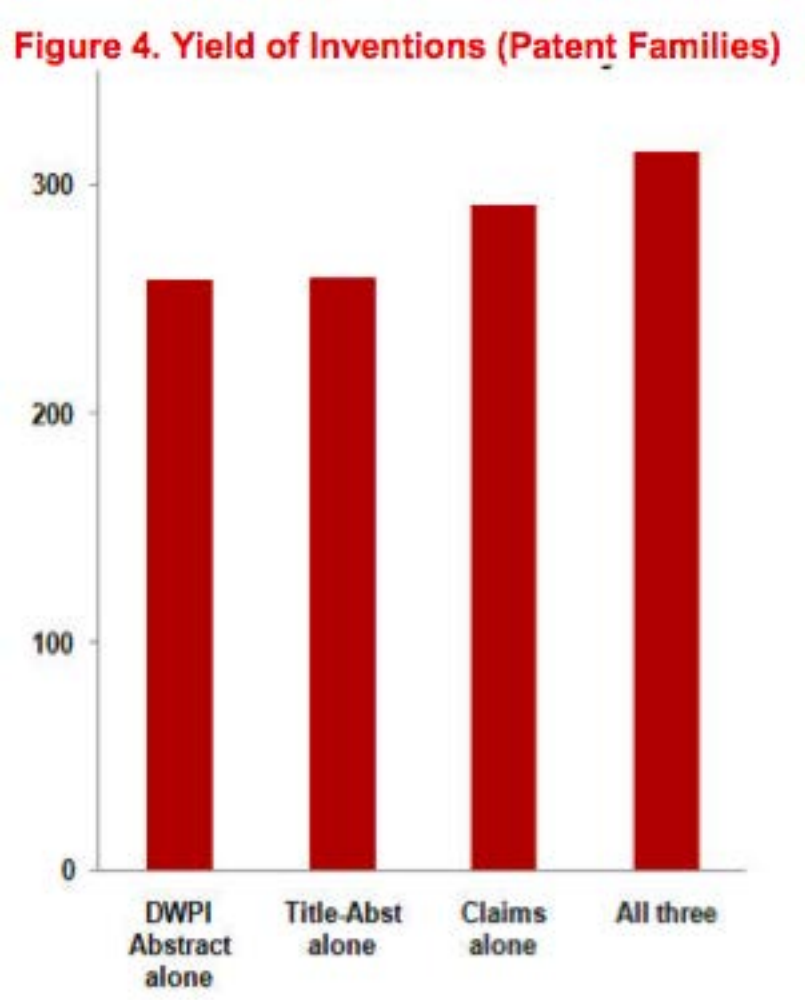
Search methodology

- Report includes extensive description of **drug name** search strategies
- Names of pharmaceuticals change over phases of drug development
- Brand name (commercialized product): **Rayataz** (in Orange Book)
- Generic name (USAN naming protocol), International Nonproprietary Name (INN): "**Atazanavir**"
  - assigned only at clinical stage by WHO in 2001 (priority year of founder patent: 1995)

Search methodology

- Various names in pre-clinical stage
  - Manufacturer name: **CGP-73547, CGP-73355, CGP-75136, BM-75136**
  - Various chemical naming conventions (methyl N-[(1S)-1-{[(2S,3S)-3-hydroxy-.....)
  - CAS registry code 198904313-31-3

Clinical phase name search yield



Maximum yield if searched in several fields

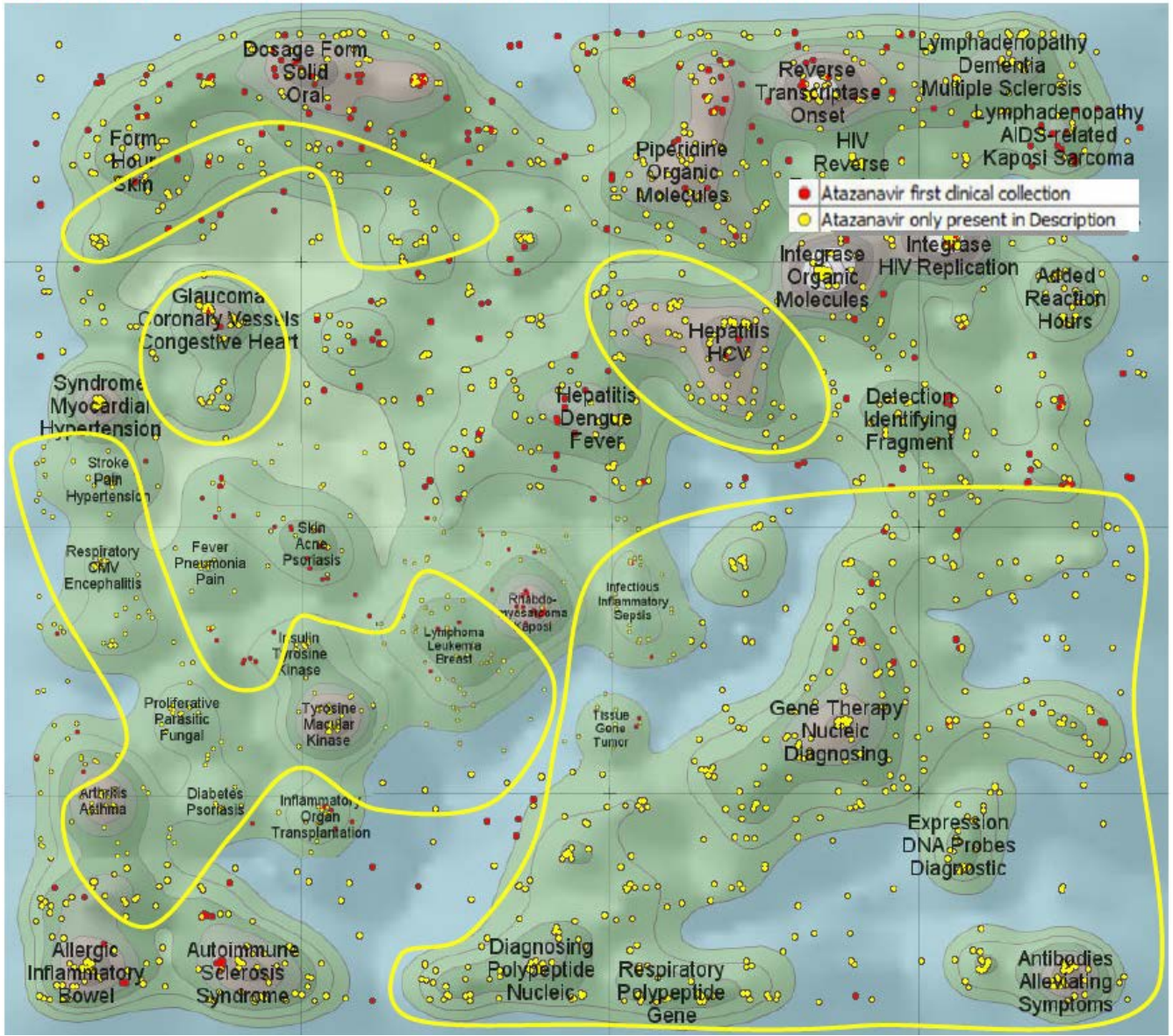
Search in description? Noise !

Clinical names in AB,TI,CL

Figure 6. Stage-One Clinical Collection

Clinical names in AB,TI,CL + description

Figure 7. Stage-Two Clinical Collection – Map shows collection improvement is needed



Absence of red in neighborhood of yellow indicates potential noise

Clinical names in AB,TI,CL,DE cleaned collection

Figure 8. Stage-3 Clinical Collection after Improvement

Additional DE are not shown as dots; TI/AB/CL are more evenly spread

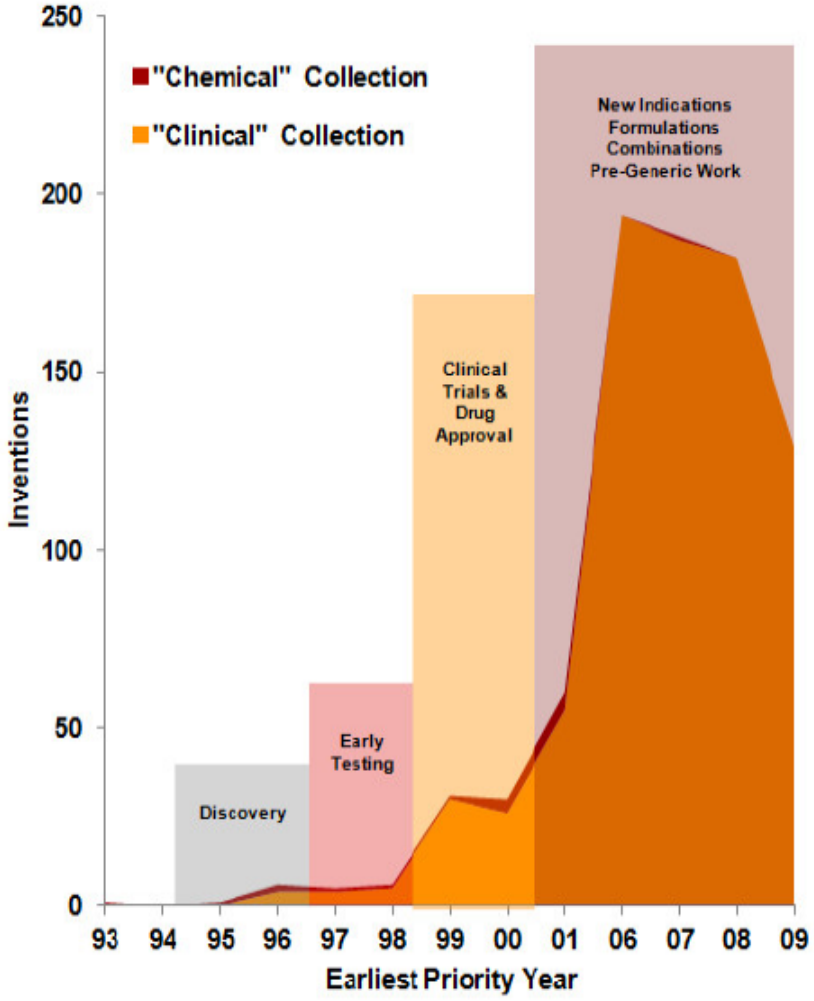
Assembling chemical collection

- After the clinical collection was assembled additional documents from the pre-clinical phase were searched
- Mixed approach: keyword using chemical name components, classification, CAS codes, citation analysis

Atazanavir filing activity per dvlpm stage

Figure 13. Invention Timelines vs Developmental Stages

Earliest Priority Year	"Chemical" Collection	"Clinical" Collection	Invention Families
93	1		1
94			
95	1		1
96	2	4	6
97	1	4	5
98	1	5	6
99	1	30	31
00	4	26	30
01	5	55	60
06		194	194
07	1	187	188
08		182	182
09		129	129
All	19	1361	1380

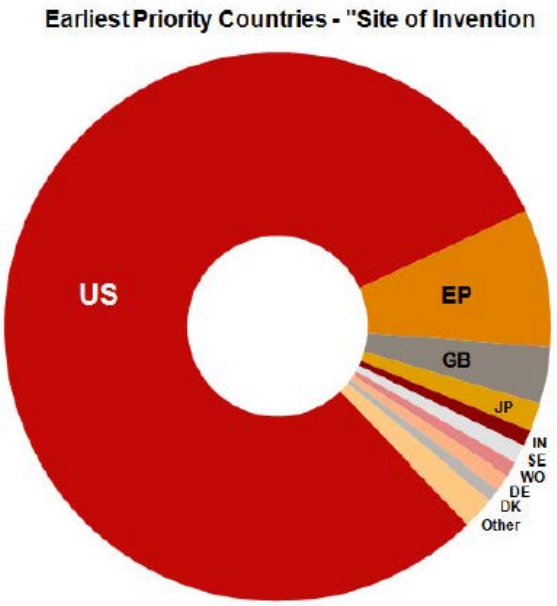


Atazanavir – priority countries (OFF)

Figure 15. Priority Country Information

Earliest Priority Country Code	Country or Authority Name	Inventions with no Granted Patrents	Inventions with ≥1 Granted Patent	# Records	% with grants
US	United States	785	320	1105	29%
EP	European Office	73	39	112	35%
GB	United Kingdom	32	14	46	30%
JP	Japan	14	9	23	39%
SE	Sweden	7	8	13	62%
DE	Germany	12	1	15	7%
IN	India	11	2	12	17%
WO	PCT	9	3	13	23%
DK	Denmark	10	1	11	9%
Other	13 Countries	20	10	30	33%
ALL		973	407	1380	29%

PCT Application Country Code	PCT Deposit Office	Count
US	United States	636
EP	European Patent Office	159
IB	International Bureau	46
CA	Canada	39
GB	United Kingdom	27
JP	Japan	20
SE	Sweden	14
IN	India	11
DK	Denmark	8
NL	Netherlands	5
IL	Israel	4
DE	Germany	3
FR	France	3
BE	Belgium	2
BR	Brazil	2
AU	Australia	2
CN	China	2
IT	Italy	2
ES	Spain	2
CZ	Czech Republic	1
SG	Singapore	1
Total		989



Atazanavir – extensions (OSF)

Figure 16. Countries Viewed as Markets

World Regions	Family Member Country Codes	Countries	National or Regional Filings
APAC	JP	Japan	554
APAC	AU	Australia	548
APAC	CN	China	376
APAC	IN	India	289
APAC	KR	South Korea	253
APAC	TW	Taiwan	207
APAC	NZ	New Zealand	82
APAC	PH	Philippines	36
APAC	VN	Viet Nam	21
APAC	SG	Singapore	14
APAC	MY	Myanmar	2
EMEA	EP	European Patent Office	763
EMEA	ZA	South Africa	170
EMEA	DE	Germany	122
EMEA	NO	Norway	118
EMEA	RU	Russia	70
EMEA	ES	Spain	61
EMEA	IL	Israel	24
EMEA	HU	Hungary	22
EMEA	CZ	Czech Republic	17
EMEA	SK	Slovakia	11
EMEA	NL	Netherlands	4
EMEA	GB	Great Britain	3
EMEA	PL	Poland	1
NA	US	United States	1114
NA	CA	Canada	356
NA	MX	Mexico	300
SA	BR	Brazil	145
Stateless	WO	PCT*	1184

Atazanavir – categories of technologies

	Categories	Hits
Chemistry & Target	Founder	1
	Combined Collections with C07D 213/	134
	Atazanavir Name Used	279
	Heterocyclic	199
	Prep - Synthesis	851
	Aspartyl or HIV Protease	316
Combinations	Combination	397
	Side Effects - Toxicity	184
	HIV Protease Inhibitors except Atazanavir	318
	Ritonavir	264
	Cytochrome P450	84
	Reverse Transcriptase	469
	Integrase	262
	Fusion Inhibitors	162
Formulations	Formulation	197
	Bioavailability - PK	129
	Stereoisomers	248
	Crystalline	53
Indications	Autoimmune - Inflammatory	310
	Cancer	394
	Kaposi	114
	Neurologic	228
	IBD	131
	Herpes	106
	Hepatitis C Virus	152
	Serine Protease Inhibitor	50

Created by automated clustering using natural language processing

Individual documents may be placed in multiple categories

Collaboration between Novartis and BMS

Figure 20 ATZ-related inventions of Novartis and Bristol-Myers Squibb by Priority Year

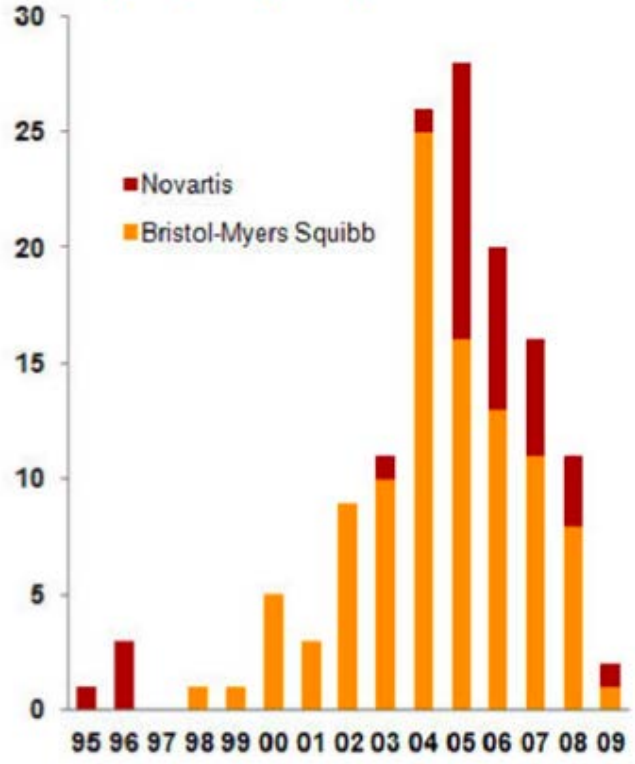
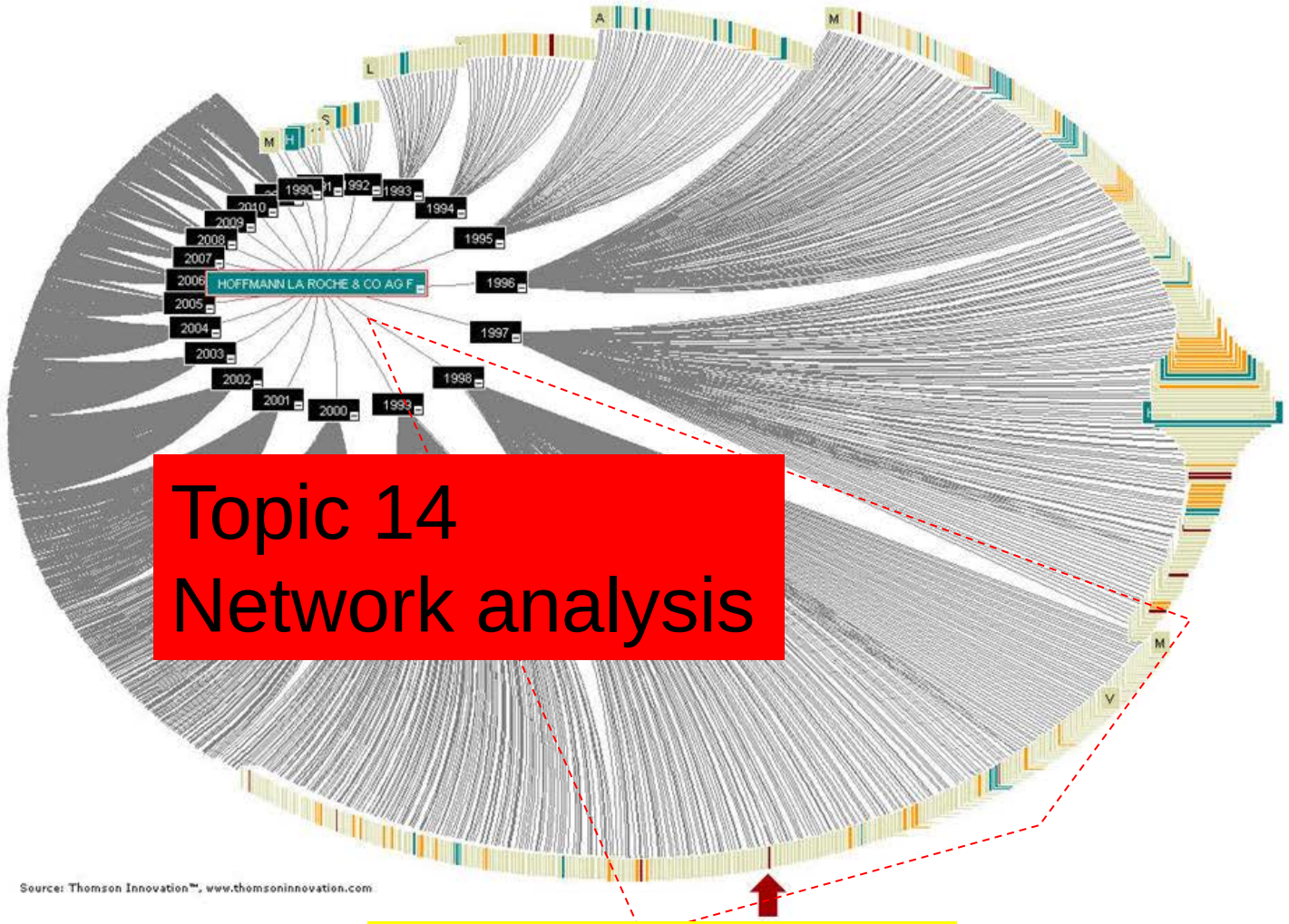


Figure 21. Atazanavir Patenting by Novartis and Bristol-Myers Squibb

Categories	Novartis	Bristol-Myers Squibb	All
All Records - Counts	33	100	133
Founder	1		1
Still Pending	18	30	48
Aspartyl or HIV Protease	3	51	54
Prep - Synthesis	26	77	103
Formulation	1	17	18
Bioavailability - PK	2	2	4
Cytochrome P450		1	1
Stereoisomers	6	17	23
Crystalline		11	11
Side Effects - Toxicity		15	15
Combination	20	16	36
HIV Protease Inhibitors except Atazanavir		14	14
Ritonavir		10	10
Reverse Transcriptase		33	33
Integrase		31	31
Fusion Inhibitors		19	19
HIV-AIDS Indication (Code)	22	2	24
Autoimmune - Inflammatory	18	14	32
Cancer	16	13	29
Neurologic	12	13	25
IBD	14		14
Hepatitis C Virus	6		6

Atazanavir – citation map

Publication Years	Citing Documents
1989	1
1990	2
1991	5
1992	8
1993	20
1994	24
1995	45
1996	120
1997	115
1998	164
1999	156
2000	187
2001	221
2002	268
2003	335
2004	255
2005	252
2006	295
2007	273
2008	288
2009	297
2010	371
2011	248
All	3950



Atazanavir – quality indicators

Selected Commercial Assignees	Invention Coun	Number of Families with ≥1 Grants	Grant Ratio	Filed in EP-US-JP-CN	Thomson Reuters Quad Patent Index®
ELAN PHARM INC	1	1	1.00	0	0.00
BRISTOL MYERS SQUIBB CO	92	62	0.67	30	0.33
TIBOTEC (J&J)	78	48	0.62	52	0.67
MERCK & CO INC	134	80	0.60	19	0.14
GENZYME CORP	12	7	0.58	4	0.33
PHARMASSET INC	9	4	0.44	3	0.33
HOFFMANN LA ROCHE	7	3	0.43	4	0.57
NOVARTIS AG	31	13	0.42	23	0.74
ASTRAZENECA AB	16	6	0.38	9	0.56
PHARMACYCLICS INC	8	3	0.38	3	0.38
CYTOVIA INC	22	8	0.36	4	0.18
ABBOTT LABORATORIES	48	16	0.33	10	0.21
EUTICALS PRIME EUROP THERAPEUTICALS	3	1	0.33	0	0.00
SUMITOMO	3	1	0.33	0	0.00
AGOURON (PFIZER)	34	11	0.32	9	0.26
PANACOS PHARMACEUTICALS INC	13	4	0.31	5	0.38
SEQUOIA PHARMACEUTICALS INC	13	4	0.31	4	0.31
VIROCHEM PHARMA INC	13	4	0.31	1	0.08
BOEHRINGER INGELHEIM INT	24	7	0.29	6	0.25
GILEAD SCIENCES INC	36	9	0.25	12	0.33
BAYER HEALTHCARE AG	4	1	0.25	1	0.25
GLAXOSMITHKLINE	64	13	0.20	8	0.13
TRISTRATA INC	10	2	0.20	3	0.30
MONOGRAM BIOSCIENCES INC	14	2	0.14	3	0.21
NEKTAR THERAPEUTICS	7	1	0.14	1	0.14
CONCERT PHARMACEUTICALS INC	8	1	0.13	1	0.13
SCHERING CORP	18	1	0.06	5	0.28
LIAONING LIFENG SCI & TECHNOLOGY DEV CO	1	0	0.00	1	1.00
ALBA THERAPEUTICS CORP	4	0	0.00	1	0.25
PROGENICS PHARM INC	6	0	0.00	1	0.17
ENANTA PHARM INC	40	0	0.00	2	0.05
SYNTA PHARMACEUTICALS CORP	14	0	0.00	0	0.00
INTELLECTUAL VENTURES	8	0	0.00	0	0.00
AICURIS GMBH & CO KG	7	0	0.00	0	0.00
RANBAXY LAB LTD	6	0	0.00	0	0.00
ZIRUS INC	6	0	0.00	0	0.00
AUSPEX PHARMACEUTICALS INC	4	0	0.00	0	0.00
ALTIRIS THERAPEUTICS INC	3	0	0.00	0	0.00
AMPLYX PHARMACEUTICALS INC	3	0	0.00	0	0.00
ARDEA BIOSCIENCES INC	3	0	0.00	0	0.00
ESTEVE QUIMICA SA	1	0	0.00	0	0.00

Percentage of families with grant is measure of quality

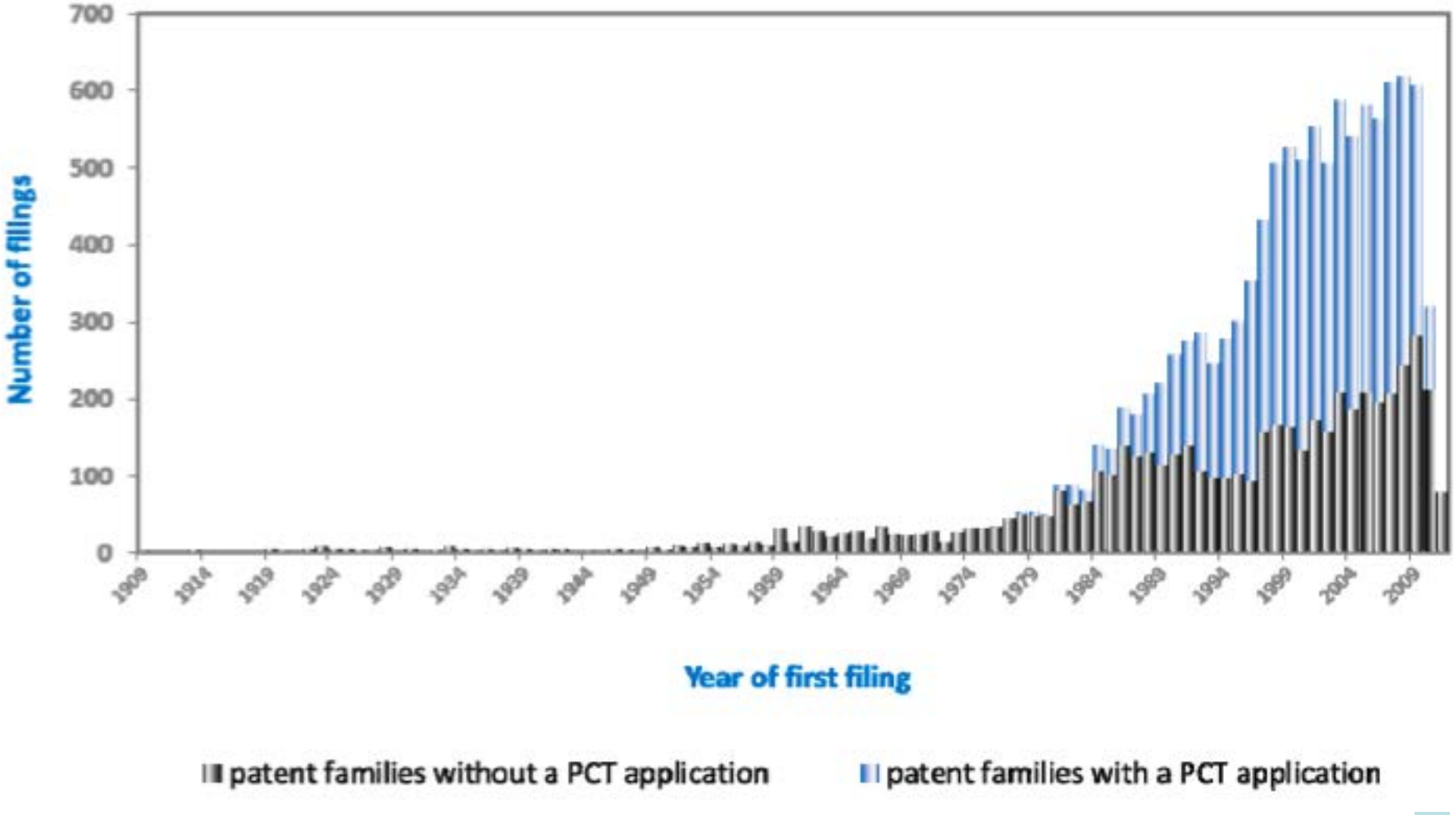
Extensions are also indicator of company confidence because of cost involved

Vaccines

PLR on vaccines

- Two parts of PLR
  - Part 1: Vaccine related patents in general (Trends)
  - Part 2: Vaccines for selected diseases (Pneumonia, Typhoid, Influenza)
- Special focus on Brazil, India, China

Vaccines: total filings



Vaccines: origin of PCT applications

Offices of filings	Number of PCT applications
UNITED STATES (US)	3117
EUROPE (EP)	881
UNITED KINGDOM (GB)	461
INTERNATIONAL BUREAU (WIPO)	333
FRANCE (FR)	280
CANADA (CA)	273
AUSTRIA (AU)	226
JAPAN (JP)	222
NETHERLANDS (NL)	91
SWEDEN (SE)	83
CHINA (CN)	72
KOREA (KR)	68
DENMARK (DK)	62
SPAIN (ES)	48
CUBA (CU)	41
INDIA (IN)	39
ISRAEL (IL)	37
BRAZIL (BR)	31
GERMANY (DE)	30

Table 2 - Origin of PCT applications

Vaccines: OFF

Offices of first filing	Number of filings
UNITED STATES (US)	5230
CHINA (CN)	1133
UNITED KINGDOM (GB)	942
JAPAN (JP)	632
RUSSIA (RU)	625
EUROPE (EP)	581
FRANCE (FR)	455
AUSTRALIA (AU)	245
KOREA (KR)	232
GERMANY (DE)	222
WIPO (WO)	148
DENMARK (DK)	89
CANADA (CA)	81
SPAIN (ES)	79
BRAZIL (BR)	75
SWEDEN (SE)	71
INDIA (IN)	69
UKRAINE (UA)	68
NETHERLANDS (NL)	56
CUBA (CU)	56
ITALY (IT)	51
HUNGARY (HU)	39
TAIWAN (TW)	36
SWITZERLAND (CH)	35
BULGARIA (BG)	33
NEW ZEALAND (NZ)	29
ISRAEL (IL)	27
ARGENTINA (AR)	26
AUSTRIA (AT)	23
SOUTH AFRICA (ZA)	20

Offices of first filing	Number of filings
CZECH REPUBLIC (CZ)	18
ROMANIA (RO)	18
IRELAND (IE)	17
POLAND (PL)	14
MEXICO (MX)	13
BELGIUM (BE)	13
NORWAY (NO)	12
FINLAND (FI)	11
SINGAPORE (SG)	6
MALAYSIA (MY)	5
CHILE (CL)	5
LATVIA (LV)	4
LUXEMBOURG (LU)	4
SLOVENIA (SI)	4
SLOVAKIA (SK)	3
PORTUGAL (PT)	3
CROATIA (HR)	2
KAZAKHSTAN (KZ)	2
GUATEMALA (GT)	2
GREECE (GR)	2
ALGERIA (DZ)	1
COLOMBIA (CO)	1
GULF COUNCIL (GC)	1
HONG KONG (HK)	1
MOLDOVA (MO)	1
MONGOLIA (MN)	1
MOROCCO (MA)	1
PHILIPPINES (PH)	1
TURKEY (TR)	1

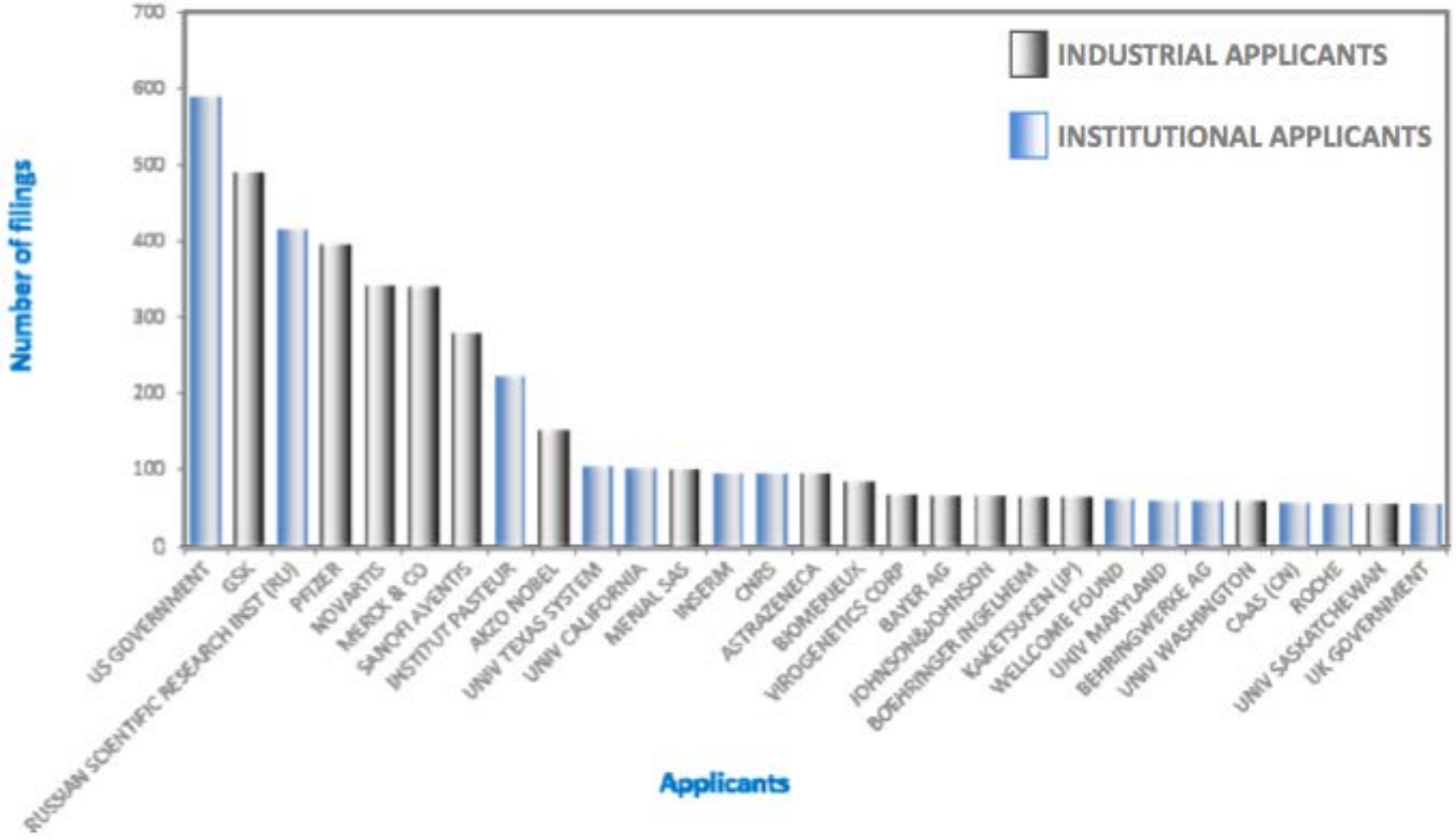
Vaccines

Priority country (OFF) is no proper indicator of innovation activity

		Number of filings in each patent authority	Number of filings according to inventors' place of residence
PCT	WORLD	148	/
AMERICA	UNITED STATES	**5230**	**4384**
	CANADA	81	**545**
	BRAZIL	75	53
	CUBA	56	59
	ARGENTINA	26	38
EUROPE	EUROPE	**581**	/
	UNITED KINGDOM	**942**	**730**
	FRANCE	**455**	**699**
	GERMANY	222	**527**
	DENMARK	89	91
	SPAIN	79	118
	SWEDEN	71	186
	NETHERLANDS	56	360
	ITALY	51	282
	HUNGARY	39	28
	SWITZERLAND	35	184
	BULGARIA	33	35
	AUSTRIA	23	107
	BELGIUM	13	**414**
EURASIA	RUSSIAN FEDERATION	**625**	347
	UKRAINE	68	34
ASIA	CHINA	**1133**	**865**
	JAPAN	**632**	**425**
	KOREA	232	231
	INDIA	41	98
	TAIWAN	36	88
	SINGAPORE	6	49
MIDDLE EAST	ISRAEL	27	84
AFRICA	SOUTH AFRICA	20	25
OCEANIA	AUSTRALIA	245	364
	NEW ZEALAND	29	35

Table 5 - Comparison between place of filings and origin of inventors (inventors named in 20 or more patents and patent applications)

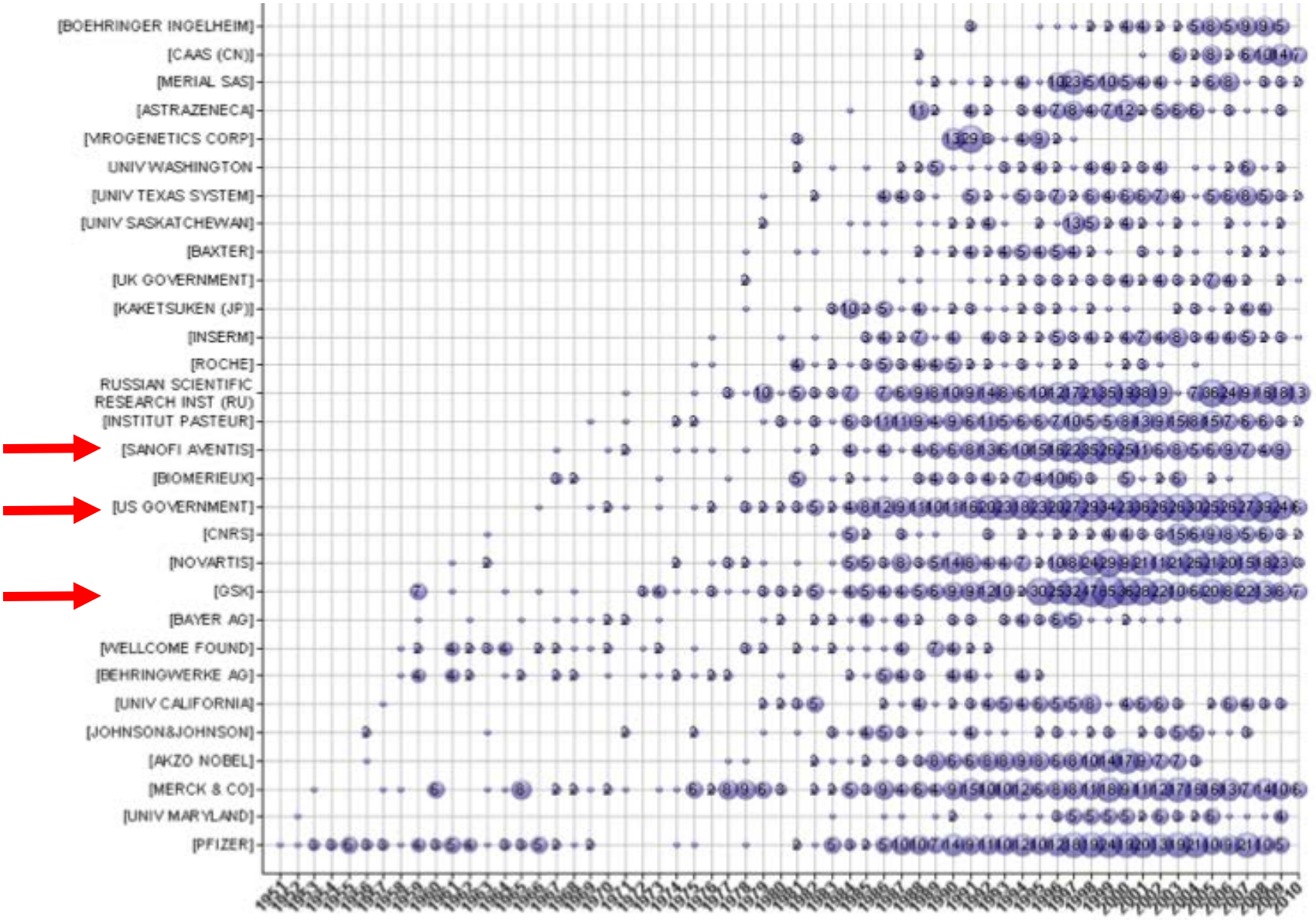
Vaccines: top applicants



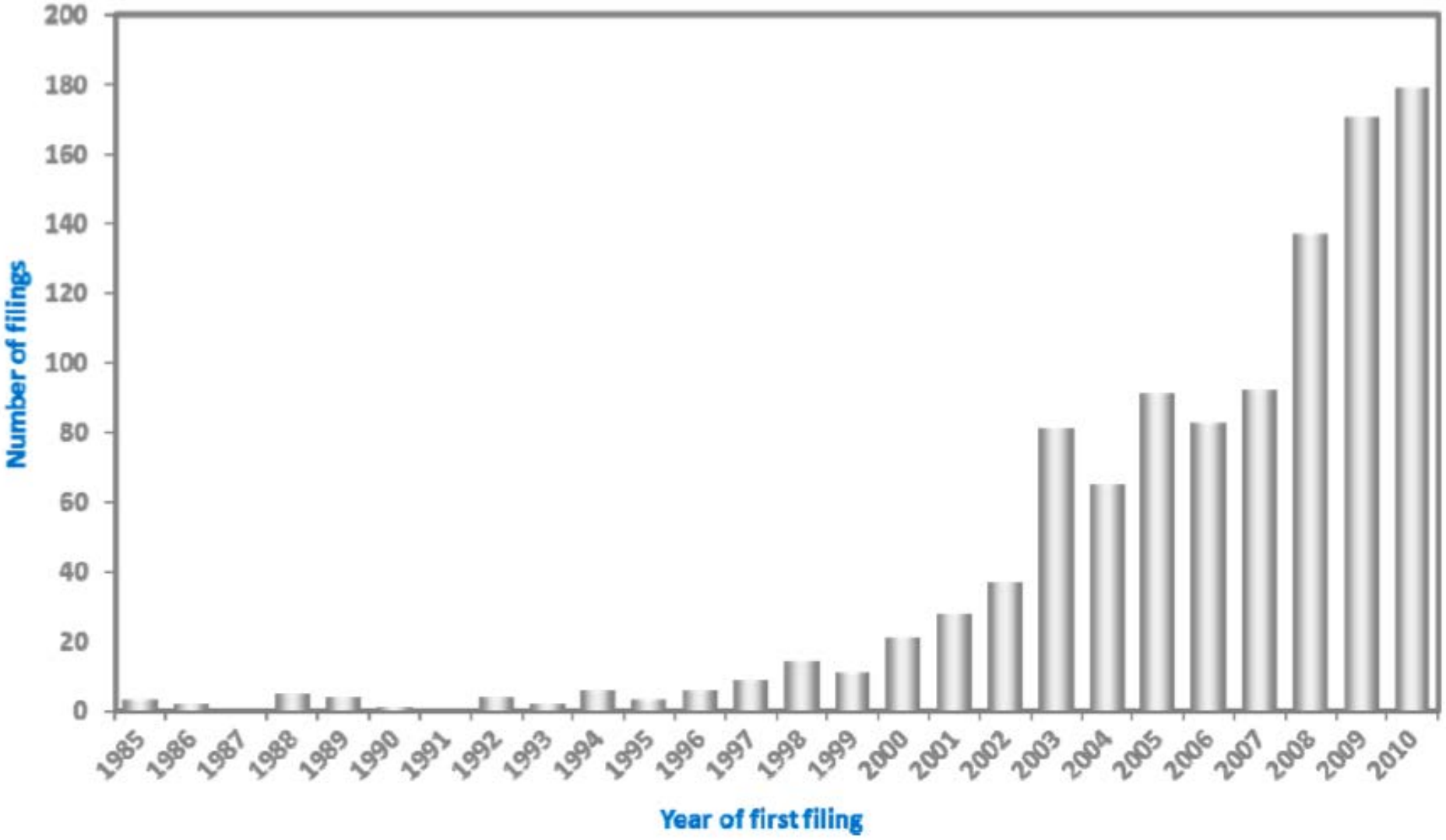
Vaccines: top applicant name variations

APPLICANTS (NATIONALITY)	ASSIGNEES (NATIONALITY IF DIFFERENT FROM APPLICANTS)
US GOVERNMENT (US)	NIH; US DEPARTMENT OF AGRICULTURE; US ARMY; US DEPARTMENT OF VETERANS AFFAIRS; US DEPARTMENT OF HEALTH AND HUMAN SERVICES; US DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
GSK (UK)	AFFYMAX TECH NV; ALLEN AND HANBURYS LTD; BEECHAM GROUP LTD; BEECHAM LAB; BURROUGHS WELLCOME CO; CORIXA CORP; GLAXO GROUP LTD; GLAXO LAB LTD; GLAXO SMITHKLINE BIOLOGICALS SA; GLAXO WELLCOME INC; GLAXOSMITHKLINE BEECHAM BIOLOGICALS SA; ID BIOMEDICAL CORP; ID VACCINE;INTELLIVAX INC; PLIVA HRVATSKA D O O; RIBI IMMUNOCHEM RESEARCH INC; SMITHKLINE FRENCH CANADA LTD; SMITHKLINE RIT BE; SMITHKLINE BEECHAM ANIMAL HEALTH; SMITHKLINE BEECHAM CORP; SMITHKLINE BEECHAM BIOLOGICALS SA; SMITHKLINE BEECHAM PHARMA GMBH; SMITHKLINE BIOCHEMICALS SA; SMITHKLINE BIOLOGICALS SA; SMITHKLINE CORP; SMITHKLINE R I T
RUSSIAN SCIENTIFIC RESEARCH INST (RU)	FGU research centers (e.g. FGU VNIIZZh Federal'noe Gosudarstvennoe Uchrezhdenie "Federal'nyi Tsentr Okhrany Zdorov'ya Zhivotnykh", Russia)
PFIZER (US)	AGOURON PHARMA; ALPHARMA AS; AMERICAL CYANAMID CO; AMERICAN HOME CORP PROD; APOLLON INC; COLEY PHARM GMBH; COLEY PHARM GROUP INC; CYANAMID IBERICA SA; CYANAMID WEBSTERS PTY LIMITED; DIMMINACO AG; EMBREX INC; CARLO ERBA SPA; FORT DODGE AUSTRALIA PTY; FORT DODGE LAB INC; FORT DODGE VETERINARIA SA; GENETICS INSTITUTE INC; HAPTOGEN LTD; EURALAB LTD WYETH; PARKE DAVIS AND CO; PFIZER INC; PFIZER PRODUCTS INC; PFIZER VACCINES LLC; PHARMACIA AND UPJOHN CO LLC; PHARMACIA SPAIN; POWDERJECT RES LTD; POWDERJECT VACCINES INC; POWDERMED LTD; PRAXIS BIOLOGICS INC; SEARLE AND CO; THE UPJOHN COMPANY; WARNER LAMBERT CO; WYETH CORP; WYETH DRUGS CO LTD; WYETH FARMA S A; WYETH FORT DODGE LAB; WYETH HOLDING CORP; WYETH HOME PRODUCTS CORP; WYETH PHARMACEUTICALS

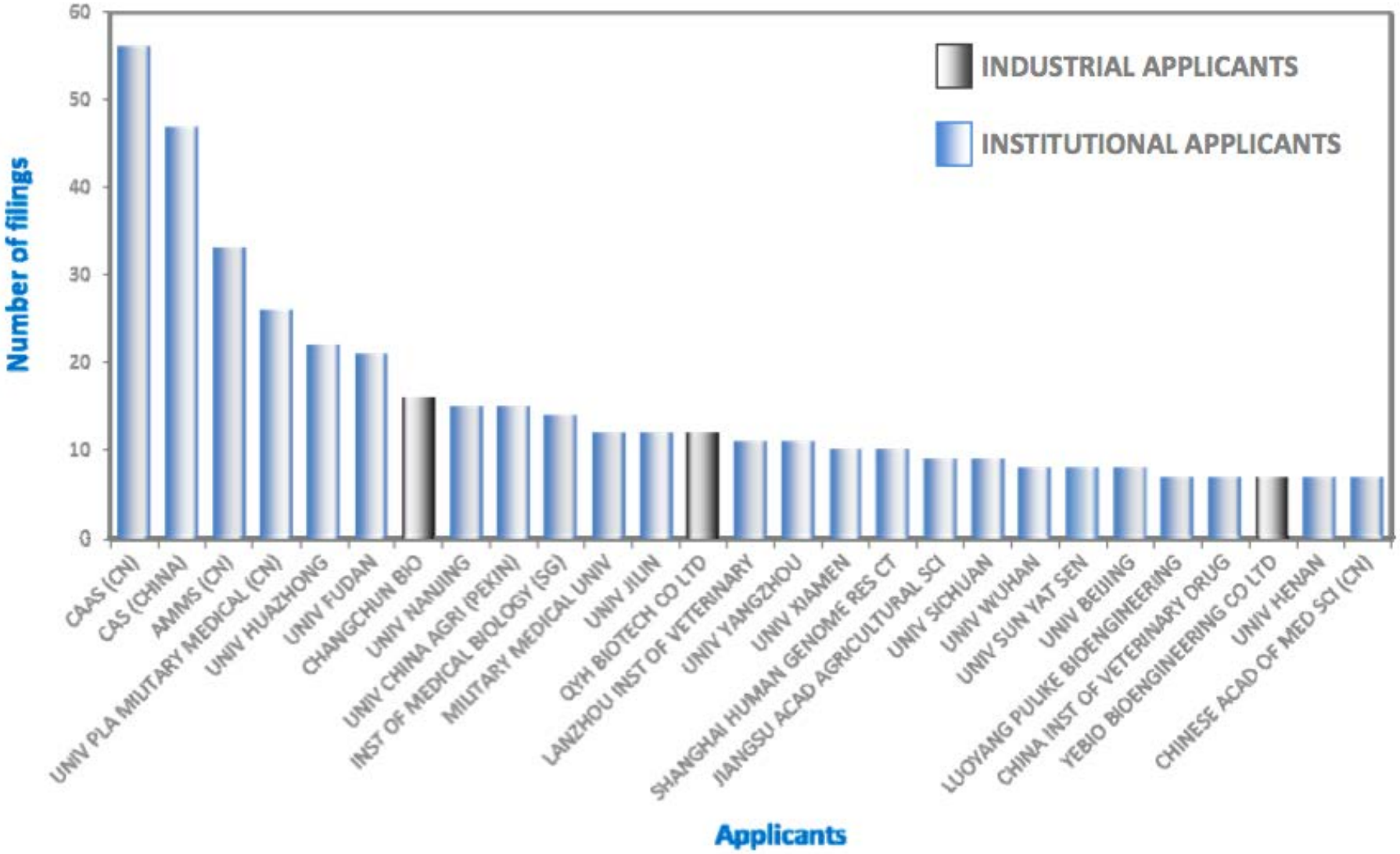
Vaccines: top applicant's time line



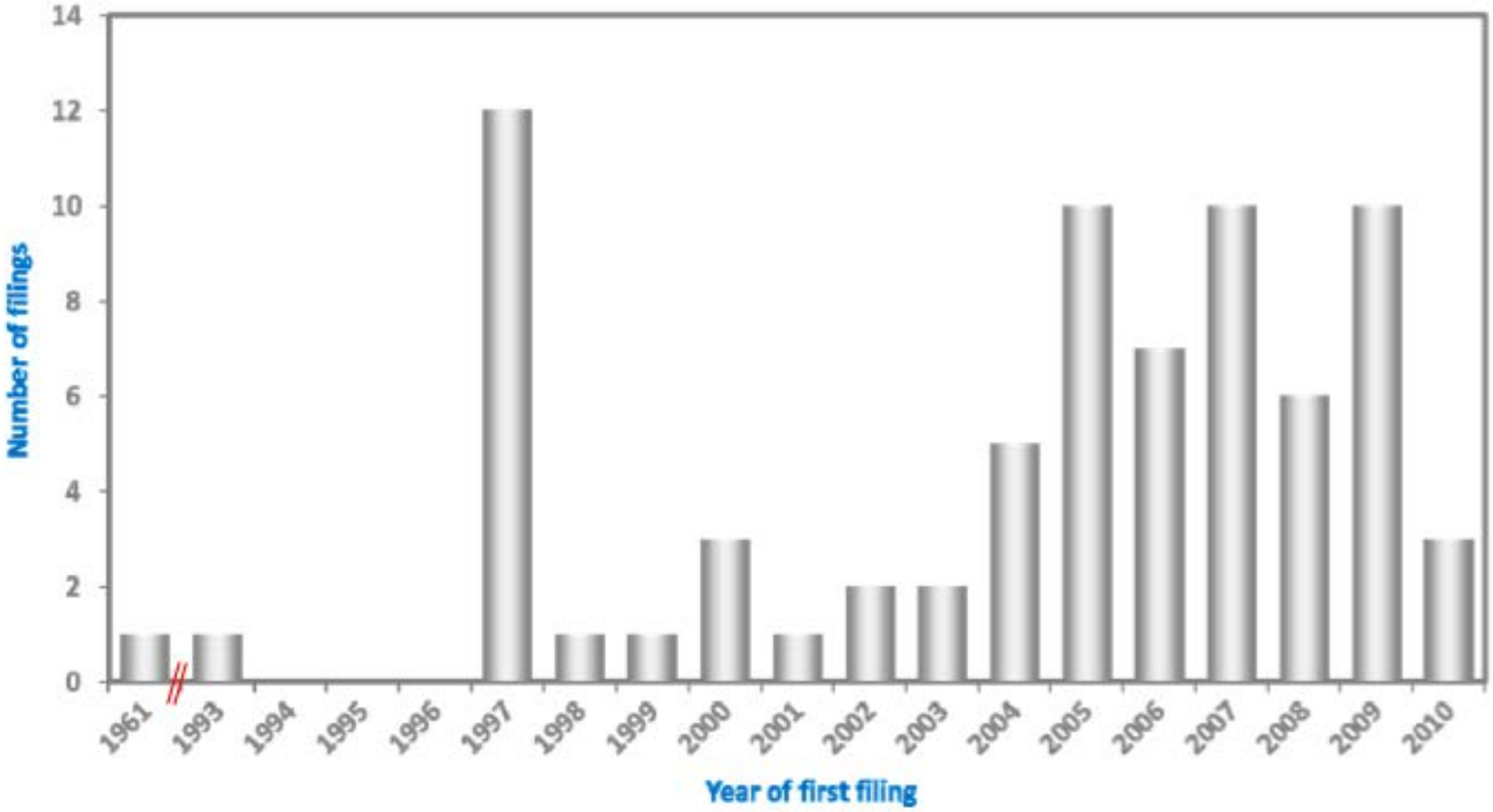
Vaccines: China



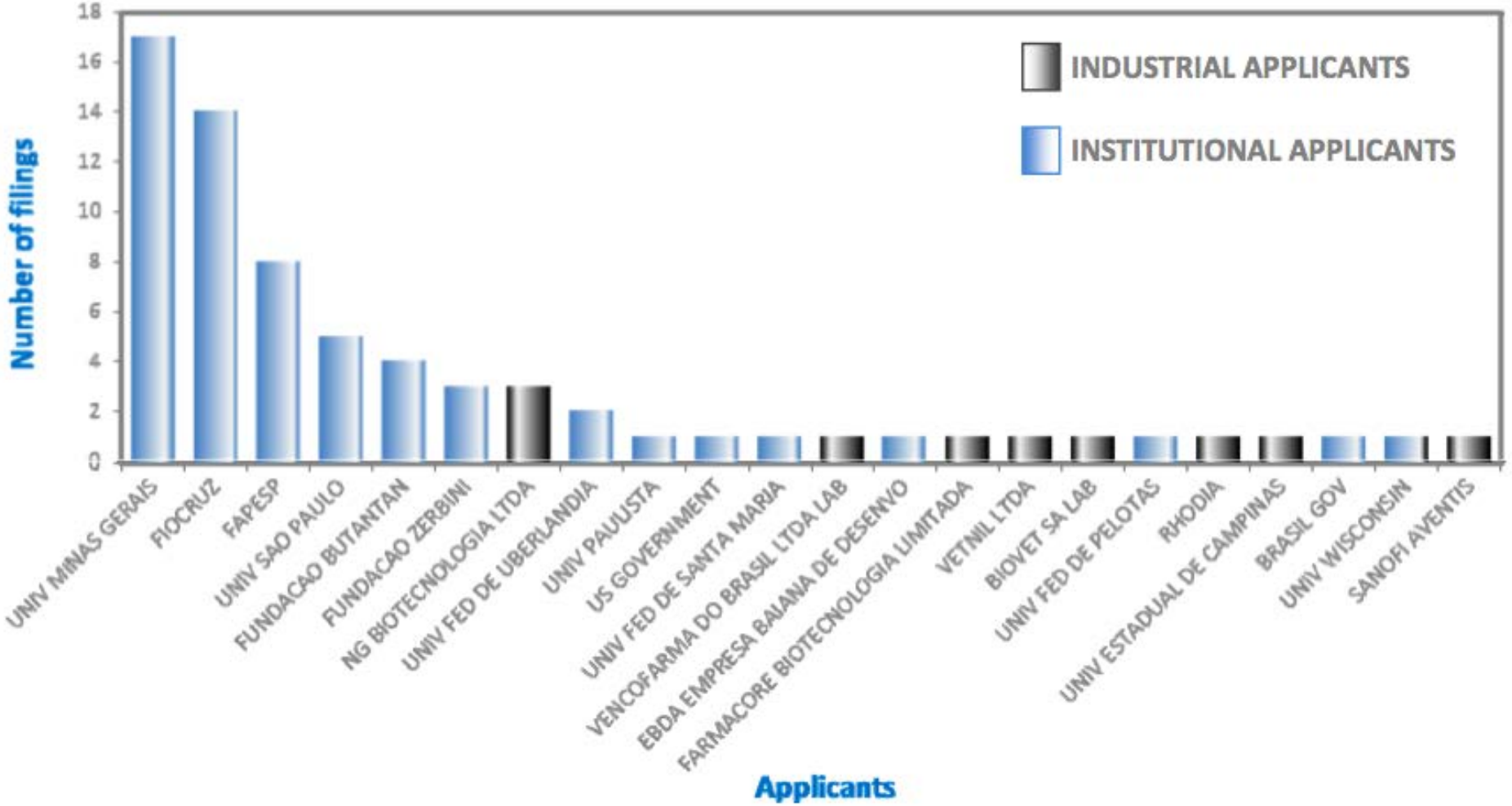
Vaccines: China top applicants



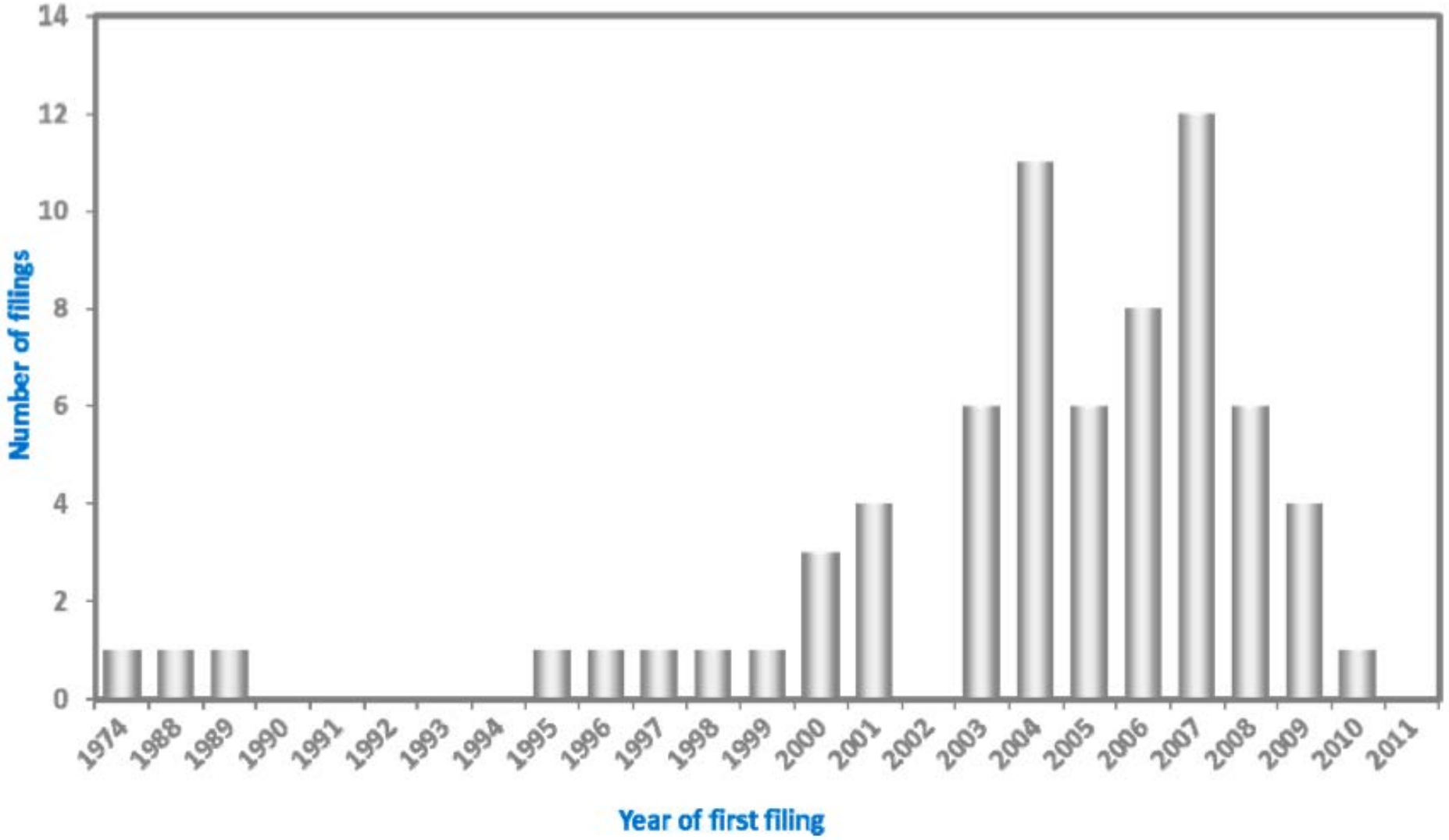
Vaccines: Brazil



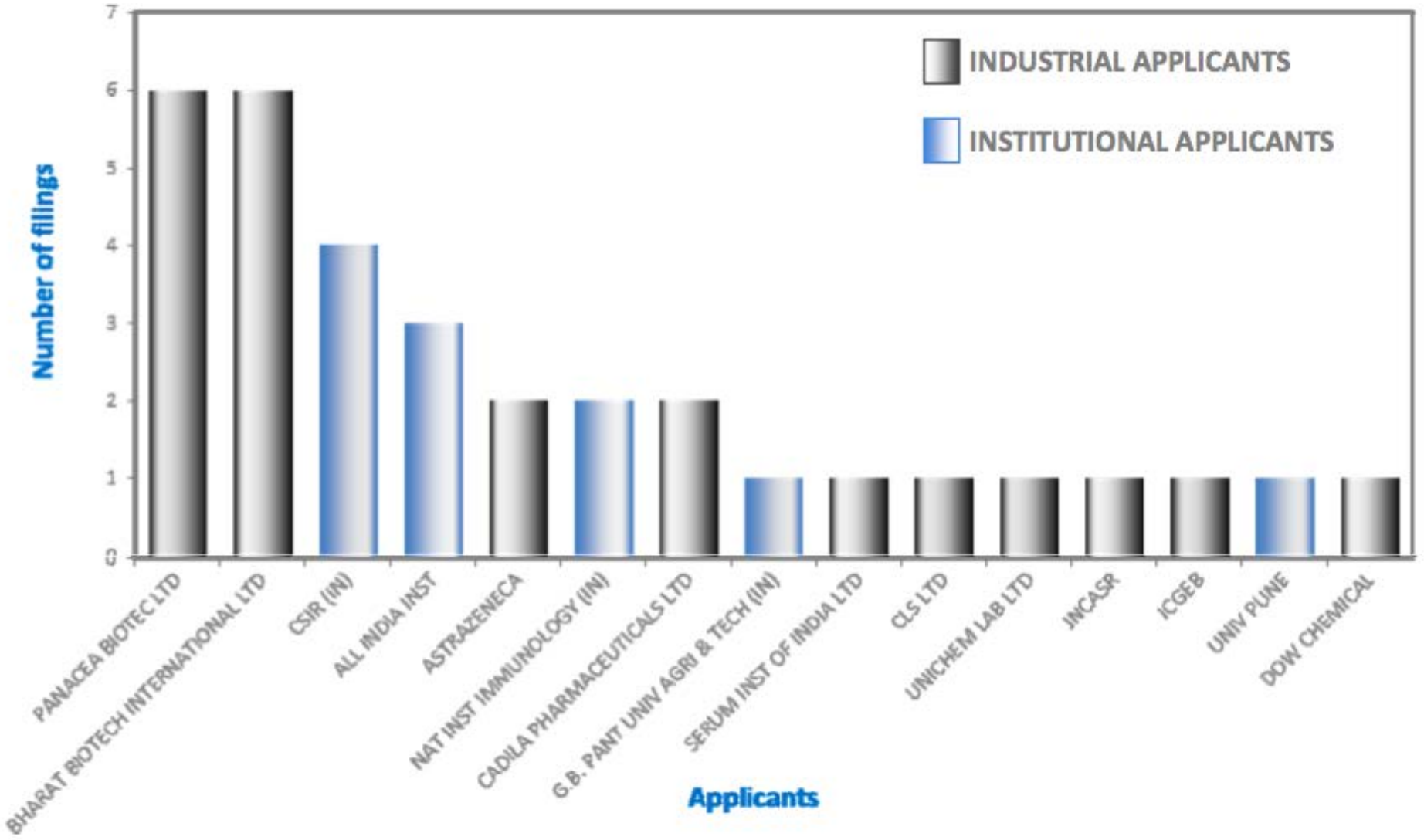
Vaccines: Brazil top applicants



Vaccines: India



Vaccines: India top applicants



E-waste management

Summary

- Collaboration with Basel Convention Secretariat (UNEP)
- Processing, recycling, material recovery of electronic waste (end of life telecommunication and computing equipment; no refurbishing)
- Three key concepts:
  - Materials recovered (plastics, rare earth and noble metals)
  - Specific sources and related processing (batteries, displays,..)
  - General processes (dismantling, sorting,...)

- Recently prepared by Thomson; just published

Summary

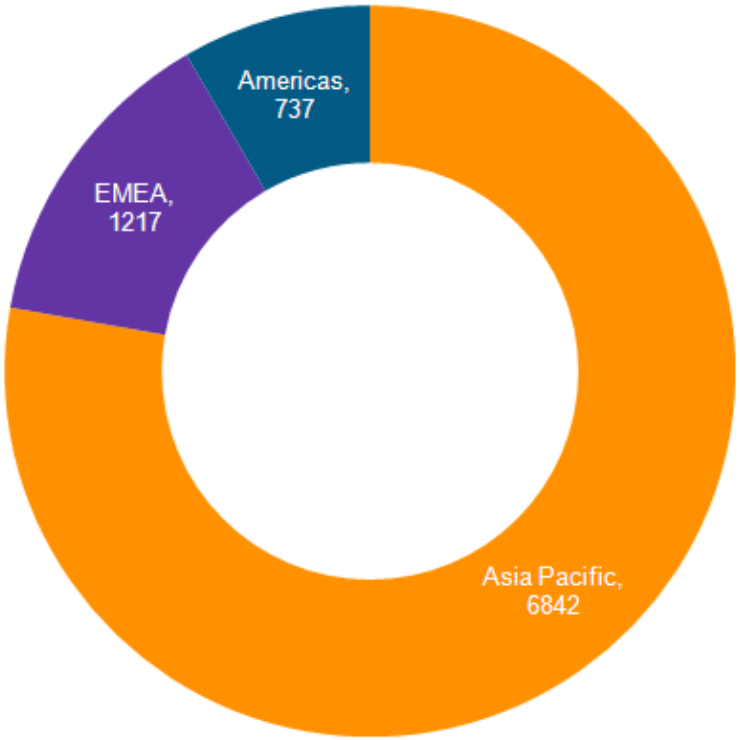
- Electronic waste is becoming a commodity
- Vast majority of activity in Asia
  - Japan: dominant many years, recent decline of activity
  - China: strong increase; mostly seeking domestic protection (99%)
- Other BRICS countries also have domestic focus
- Multiple jurisdiction filings mostly from JP, US, European companies
- Very low activity in US; recent increase, though, in rare earth metal recovery
- General strong increase in rare earths; geographically most widely protected

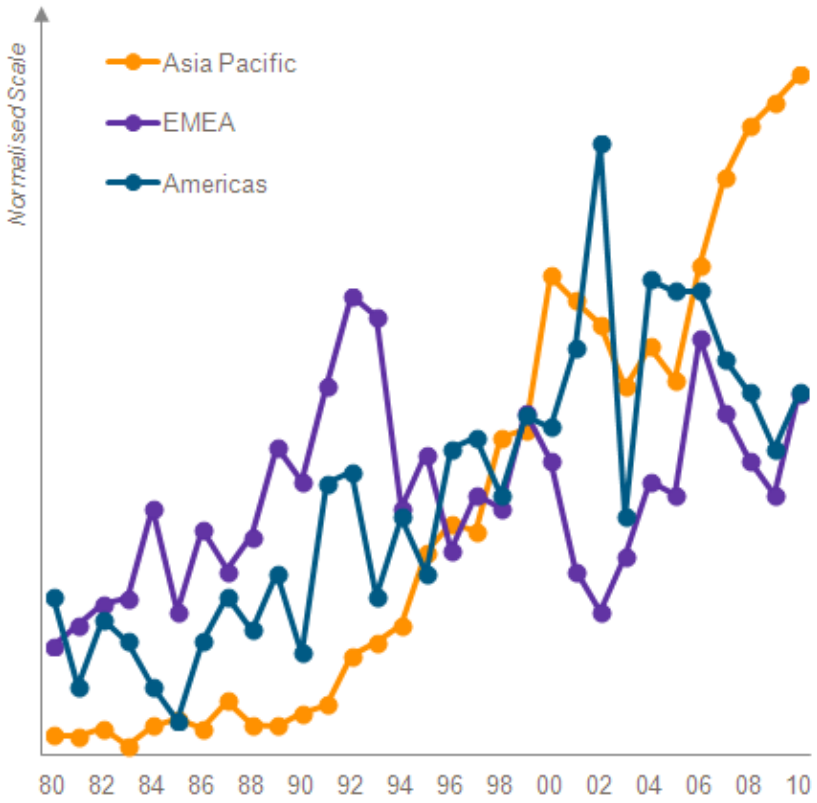
Summary

- Large proportion of protection owned by few entities with large portfolios

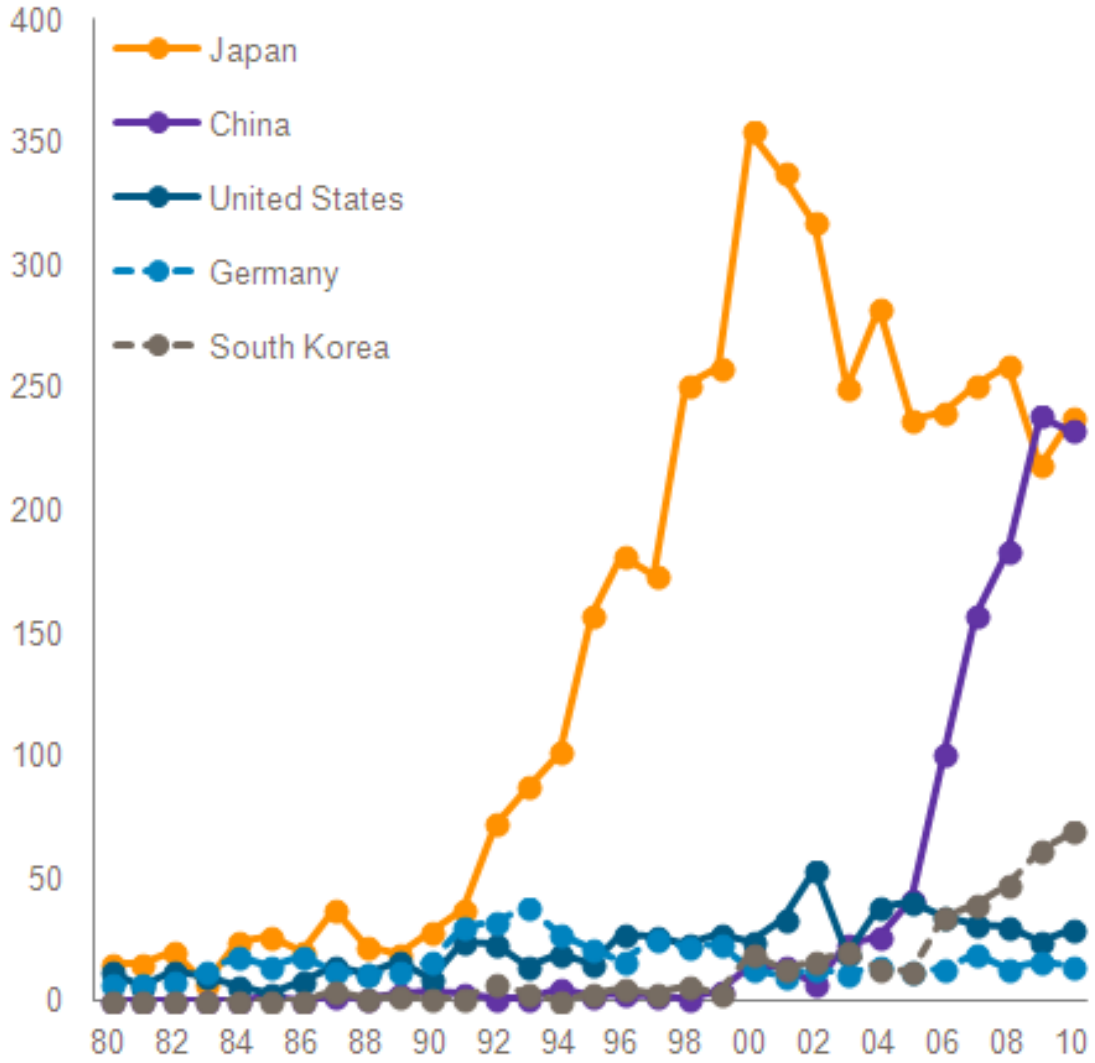
- Small patent portfolios of BRICS entities
- Annex of report describes portfolios and e-waste related activities of major players (Panasonic, Mitsubishi,...)

Activity by region (first filings)

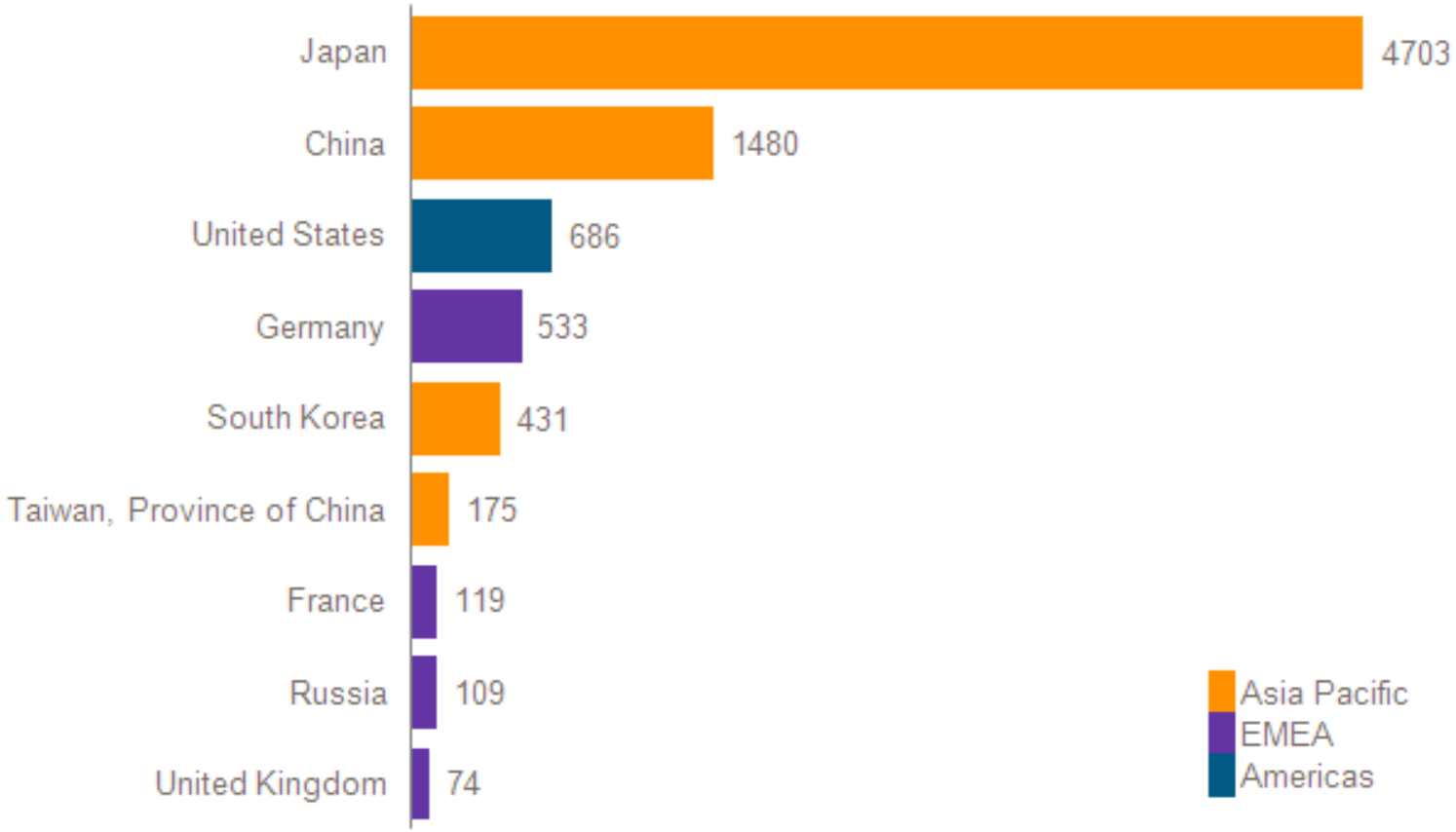




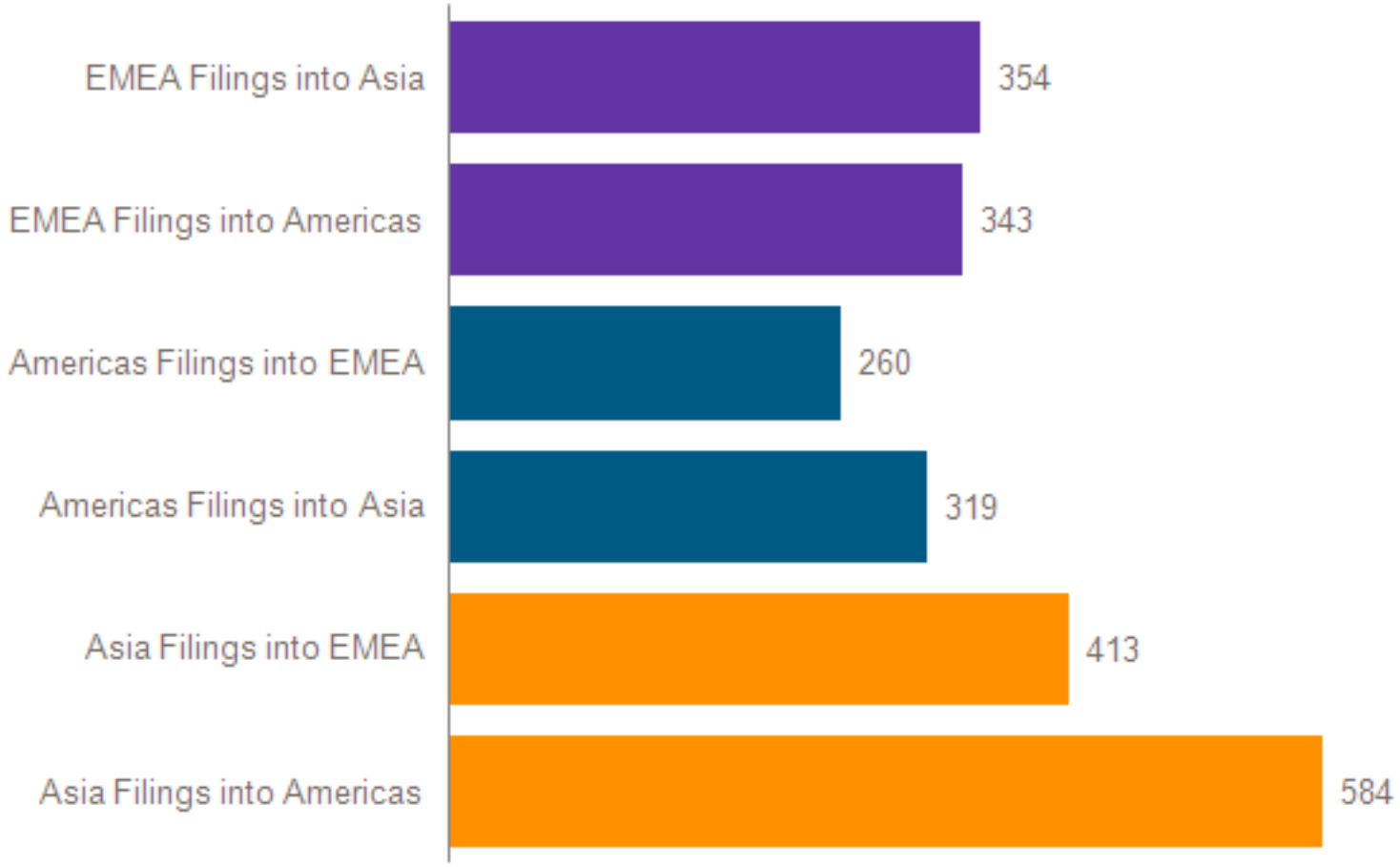
Activity top 5 OFF



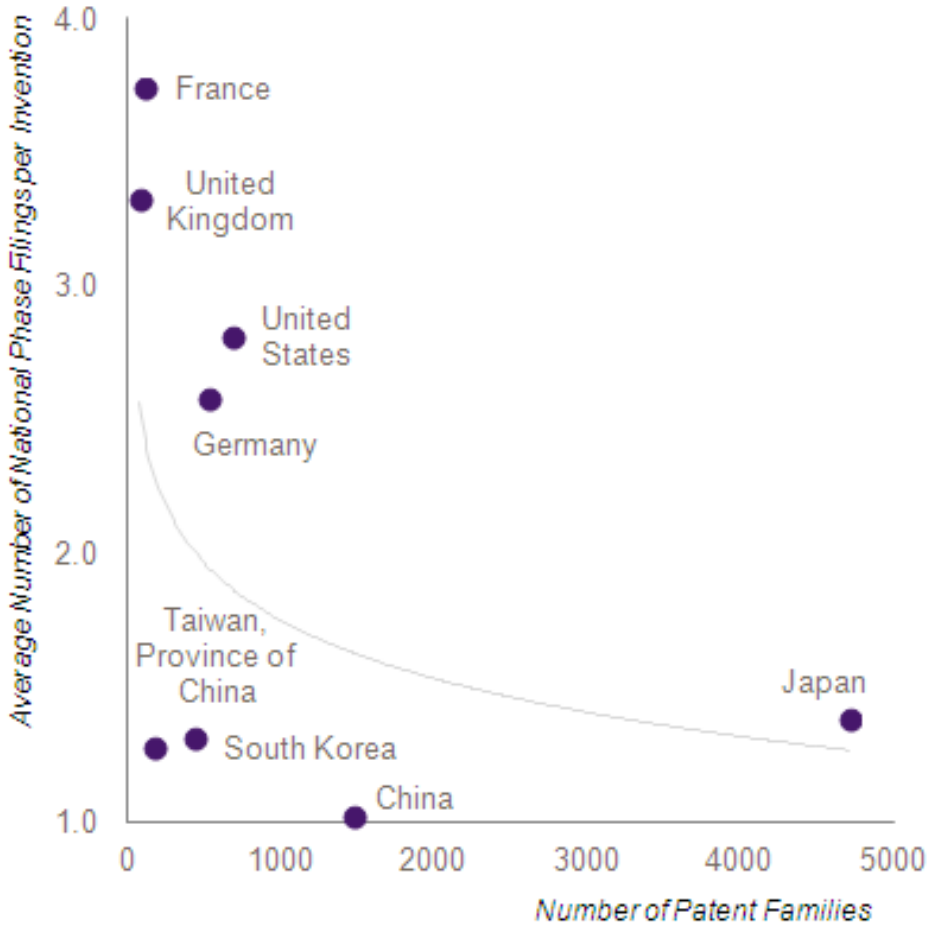
Offices of first filing (total of all years)



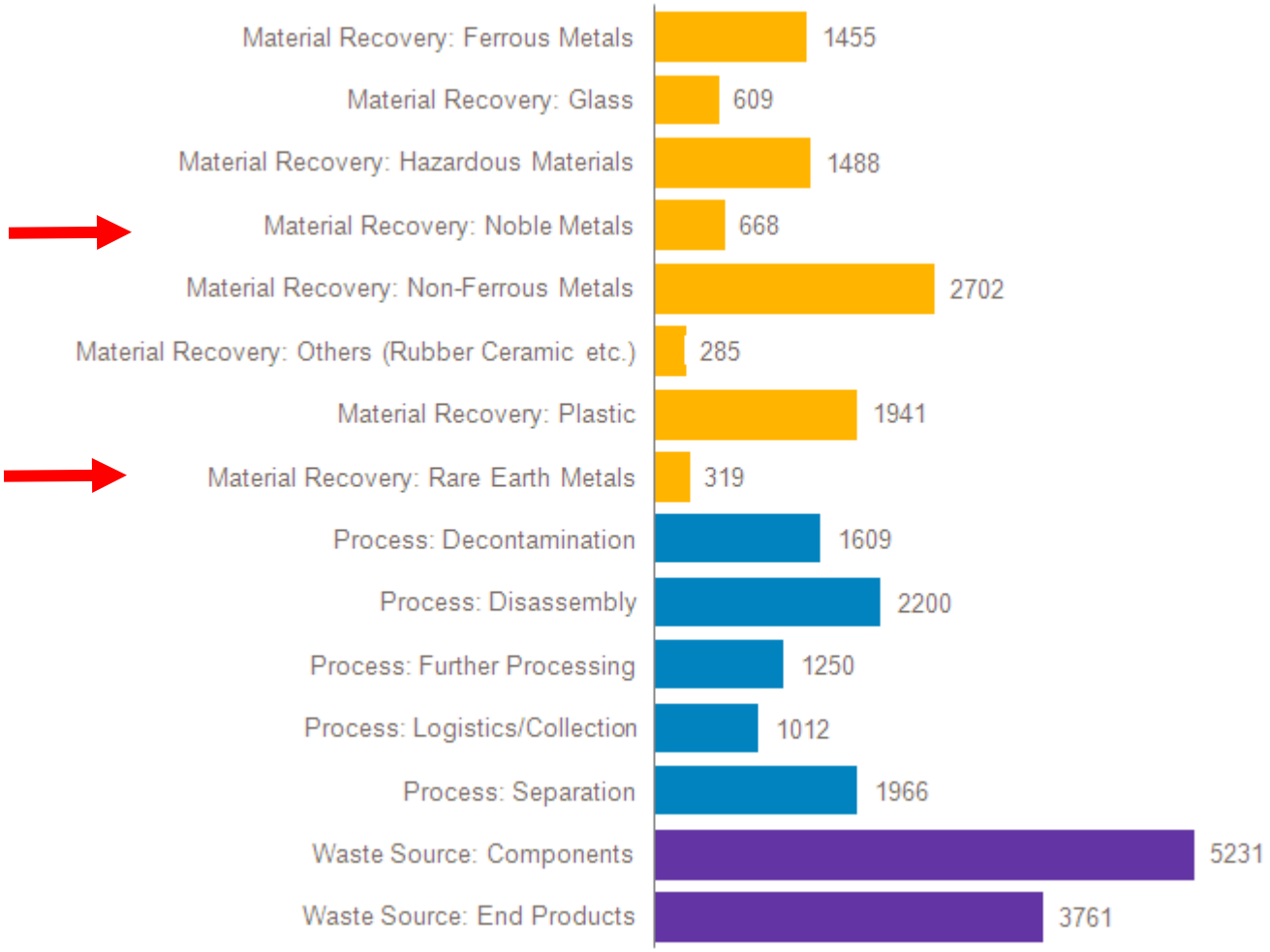
Trans-regional filings



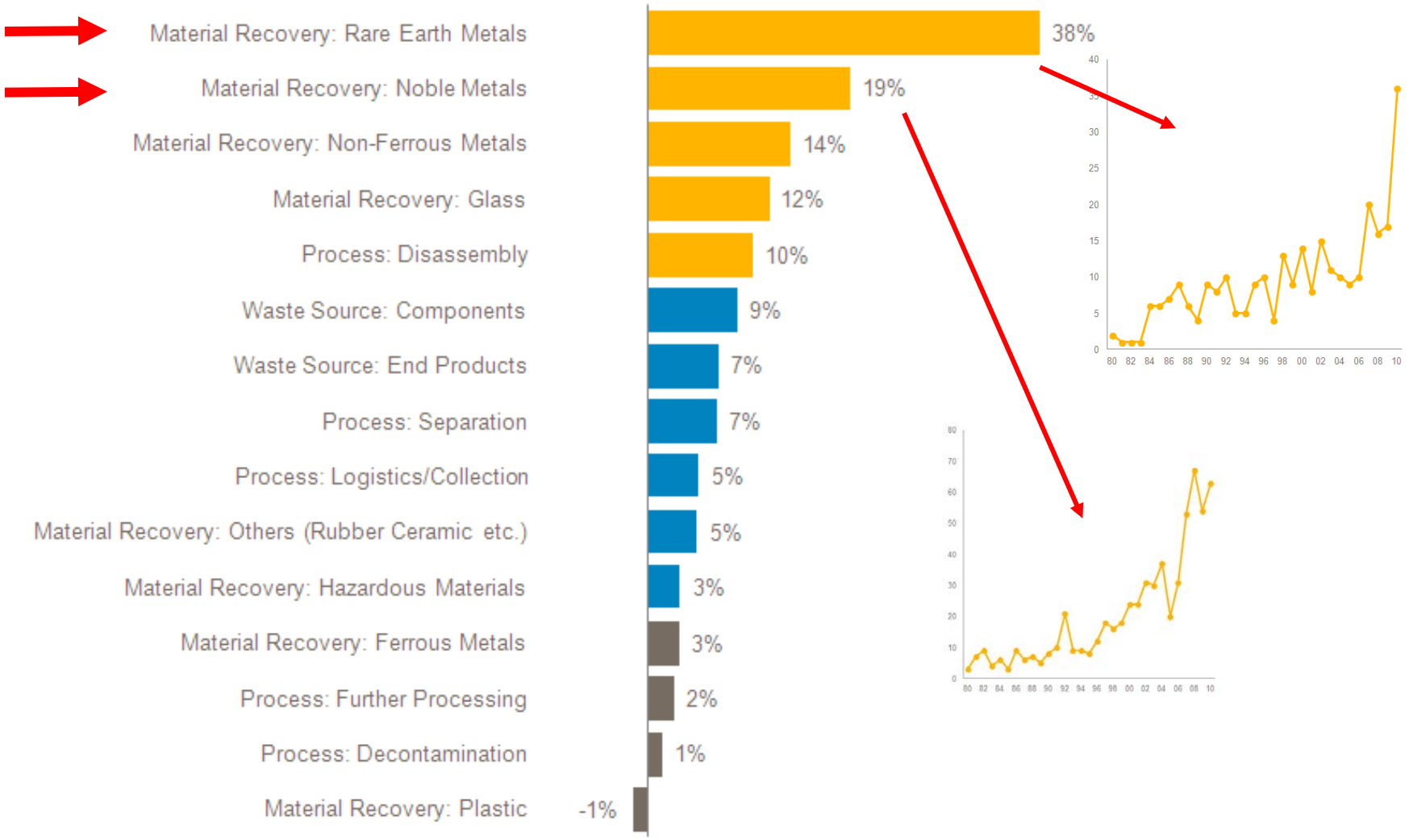
Number of jurisdictions per family



Subject matter categories



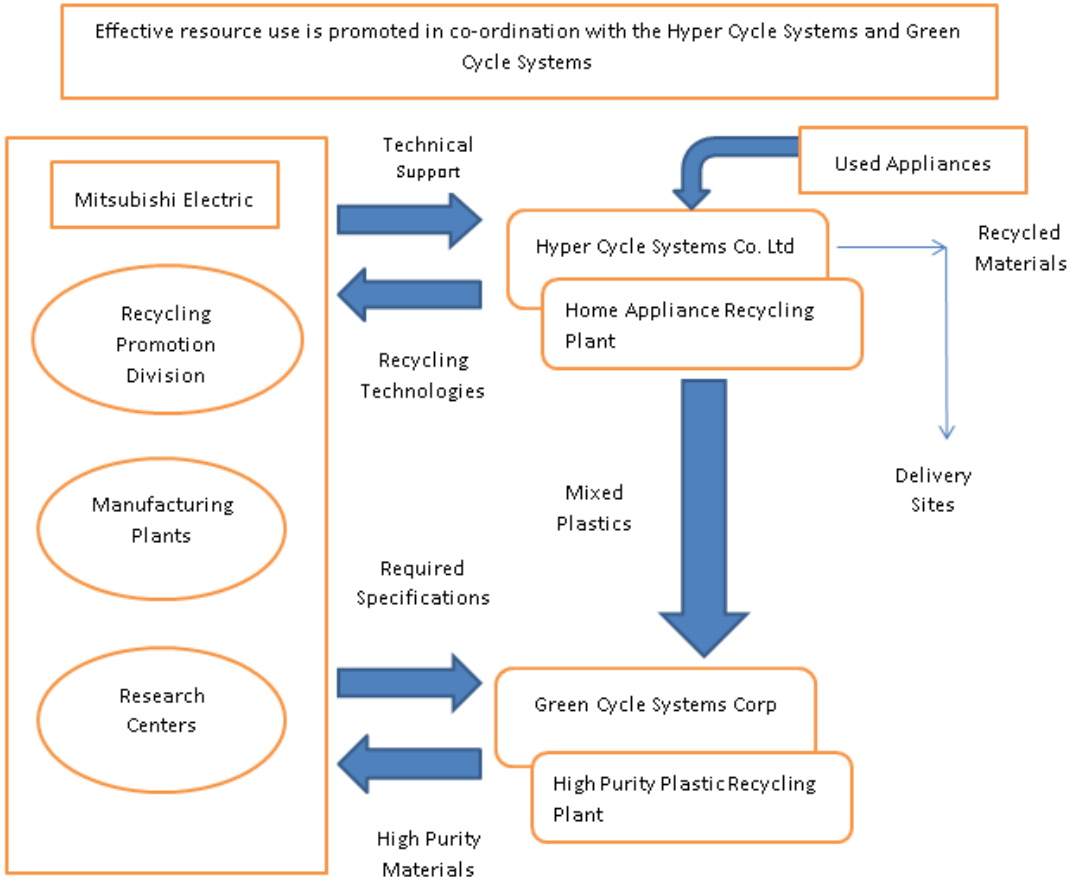
Annual growth rates



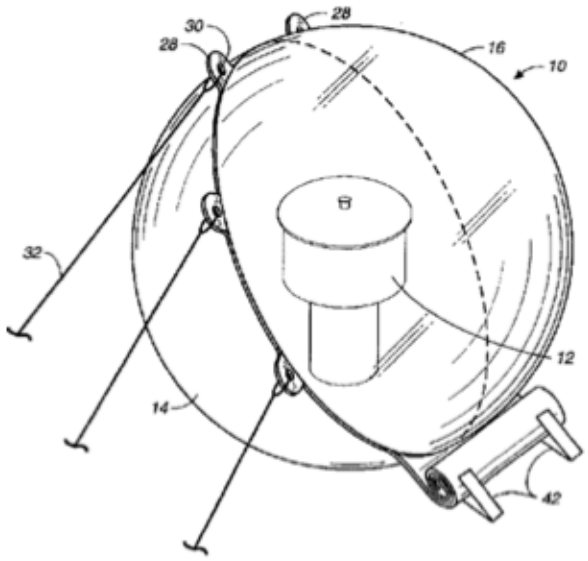
Inclusion of non patent data

Report Annex:

Mitsubishi's Electric Home Appliance Recycling System



PLR on Solar Cooking

Assignee / Inventor Name	STOUMEN; O'MALLEY O. (HEALDSBURG, CA), STOUMEN; JONATHAN A. (HEALDSBURG, CA)
Patent / Publication Number	US5893360A
Title	INFLATABLE SOLAR OVEN
Patent Image	
Product Image	 Product Name: CookSack ®
Reference Link	http://www.soltac.com/html/cooksackr.html
About Company / Product	The CookSack® is a patented solar device that is used to capture the heat energy of the Sun. Its parabolic mirror focuses sunlight on a thermally conductive pot filled with water to be used for purification, cooking or washing.

PLRs for developing countries ?

- Serious challenge:
  - Limited availability of national patent data
    - Bibliographic data and legal status data
      - Needed for building of families
        - Utilize information for family members
        - Local status of protection, public domain
    - Full text of truly domestic applications/inventions

Meeting website:
http://www.wipo.int/meetings/en/details.jsp?meeting_id=31543

Thank you

lutz.mailander@wipo.int