INTEGRATING PATENTING WITH RESEARCH AND DEVELOPMENT: STRATEGY AND EXECUTION

Patents for entrepreneurs, scientists and engineers, Venture Centre, Pune

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WHAT WE WILL TALK ABOUT

- What is a patent? How is this related to innovation?
- What is the standard for patentability?
- What is a public disclosure and prior art?
- Who qualifies as an inventor?
- Patent as an information tool

INTELLECTUAL PROPERTY

Industrial property

-Patents

-Designs

-Geographical Indications

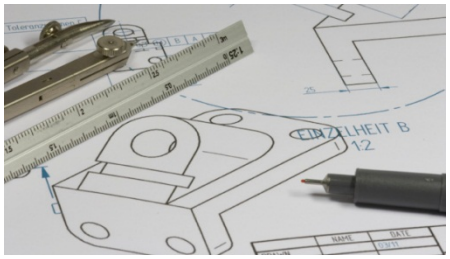
-Trademarks

Copyright

-Literary and artistic works

-Electronic media

-Performances of artists



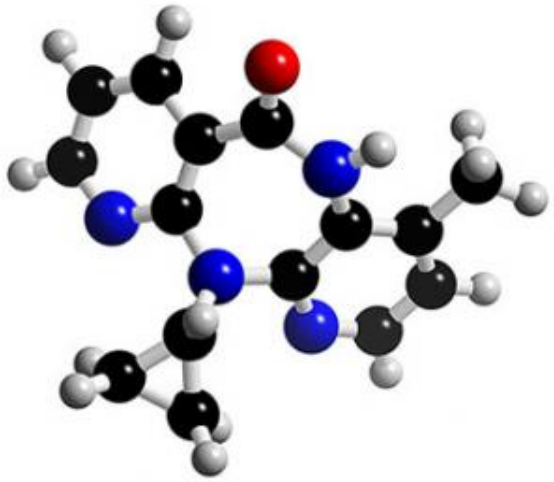
INTELLECTUAL PROPERTY OR ASSETS

- Patents
- Trademarks / Designs
- Copyrights

Intellectual property or assets management

- Formal techniques for accurately measuring and managing the potential of intellectual property or assets within an organization for creating future value
- In a sense, it is an accounting system, based in intangibles such as knowledge of workers, current R&D efforts, patent portfolio, in-house knowledge, both documented and resident in people

WHAT IS A PATENT?



- Patent
  - is an exclusive and monopoly right
    - to use the patented invention
  - for a limited area and time (20 Years)
  - by stopping others
    - from making, using, importing or selling.

- Patents are territorial rights,
  - so an Indian patent will only give the owner rights
  - within India and
  - rights to stop others from importing products into India

- No concept of International Patents

- When a patent is granted,
  - the applicant becomes the owner of the patent.
  - Like any other form of property, a patent can be bought, sold, licensed or mortgaged.

WHAT IS A PATENT

- Patent is a right granted to inventors to prevent unauthorized use of an invention within a particular territory and for a limited time
- Patent does not guarantee the inventor the freedom to exploit his invention. This can be restricted by earlier patents or external factors
- A patent allows an invention to be developed / exploited by the inventor while others are kept out. In this sense, a patent is a negative monopoly
- Patents are public disclosures. The state grants limited monopoly rights to inventors in exchange for full disclosure by the inventor
- A patent is a legal document enforceable in a court of law
- A patent is a scientific document that provides true and correct information on a subject

Undue secrecy and confidentiality hinders the progress of science and technology. Public disclosures serves the cause of progress of science and society

OBJECTIVE OF A PATENT

- Provide incentive to inventor to disclose his/her findings for the long term benefit of society rather than an attempt to profit from the invention in secret
- A patent is a legal covenant between the “state” and the “inventor”
- The patent gives the owner only a “right to exclude others from practicing the invention”, not a right to “practice the invention”. Freedom to practice is not implied in grant of a patent
- The framing of US Patent Laws in 1870 was a landmark event, providing extraordinary stimuli to science and technology and heralding the “industrial revolution” and the epoch making discoveries of the twentieth

INNOVATION AND PATENTS

- Ideas and innovations are the most precious currency in an economy
- Without constant flow of ideas, a business and economy is condemned to obsolescence
- A patent is an instrument which protects the legitimate interest of the inventor at the same time allowing for free flow of ideas

Innovation is commercial imagination

PATENTS AS A TOOL FOR INNOVATION

- Create wealth out of intellectual property
- Create value to customer
  - Keeps competitiors at bay
- Provide secure technology transfer
  - Minimize probability of infringement
  - Open global markets for products and services
- Competitive technology assessment and foresight

Patents by themselves do not define how it may be used to create wealth; one can choose to use patents for competitive positioning in the market place; or, one can donate the patent in such a manner that it is widely available for the good of the people. Similarly, the owner of the patent can seek personal financial gain or forgo it in the larger public interest

REQUIREMENTS OF PATENTABILITY

Substantive requirements

- Subject matter : 101
- Utility : 101
- Novelty : 102
- Obviousness : 103

Procedural requirements

- Enablement
- Definiteness : 112
- Best mode

Ideas /concept cannot be patented

BODY OF PATENT

"Subject"

"Prior art"

Statement of the "problem"

"Objects" of the invention (benefit)

"Definition" of the invention

Elaboration of the invention

Description of "utility"

Working examples

"Claims" or legal description of exclusive rights

Background of the invention

Summary of the invention

Description of specific embodiments

Examples

Claims

WHAT IS DISCLOSED IN A PATENT APPLICATION?

- Enablement: Must teach others how to make and use the invention
- Written Description: Must describe the invention
- Best Mode: Must disclose the best way of making and using the invention

Each of the above is examined by a Patent Office Examiner with respect to ***what is claimed***

WHAT IS DISCLOSED IN A PATENT APPLICATION?

- Information which satisfies various aspects of the Patent statute

  – Utility: There must be a demonstrated utility, or an assertion of utility believable by one of skill in the art
  – Novelty: What is disclosed must be different from what is already known
  – Non-obviousness:
  ✓ Knowledge at the time of invention must not be obvious to one of ordinary skill in that area determined by scope / content of prior art
  ✓ As level of ordinary skill in technology increases, so does the obviousness of advances
  ✓ Others have tried and failed
  ✓ Unexpected results, etc.

HOW TO WRITE THE PATENT APPLICATION

1. Think : What is the inventive step
   How is your method is different from the way other people do it ? Characterize the invention at the most abstract level ?.
2. Has anybody else done it before?
3. Writing the text : Structure
   - Introduction
     Area of application
     Problem the invention addresses
   - Prior art
     How do other do it
     what is wrong or inadequate with what they do?
     Cost, complexity, difficulty of manufacture?

HOW TO WRITE THE PATENT APPLICATION

- Description of invention
  - The inventive step
  - What is right or better about what we propose
  - Examples of implementation
- Writing the text : Wording
  - Scientific accuracy
  - Precision in language
  - Legal veracity
  - Others cannot get around it
    Ability to use the invention without “undue experimentation” (specification)

HOW TO WRITE THE PATENT APPLICATION

- Definiteness inquiry
  Understanding limits of invention based on claim language

<u>Best mode</u>

Best way known to him/her to carry out the claimed invention

Disclosure must allow a person of “ordinary skill in the art” to practice the invention

Concealment of best mode results in rejection

SUBJECT MATTER

- Manufacture
- Machine
- Composition of matter
- Process

e.g.

Genetically modified bacteria human engineered mice

- Utility
  Minimum demonstration
- Novelty
  Not anticipated in “prior art” “prior art”- anything previously published, patented, known, used, sold, publications by inventors more than one year before filing patent application

CLAIMS

- A cell comprising a gene encoding an adhesion protein…
    - A prokaryotic cell…
    - An *Escherichia coli* cell…
        - …comprising a mammalian gene…
        - …comprising a human gene...

METHOD CLAIMS

- New use for an old drug is patentable
- Claims to multiple new uses can be obtained by more than one party provided that the new uses are novel and non-obvious
- Composition versus Method claims

  1. An isolated nucleic acid encoding a cytokine.

  2. A method of alleviating a disease in mammal comprising administering to said mammal a vector comprising an isolated nucleic acid encoding a cytokine.

- Dependent claims

  3. The isolated nucleic acid of claim 1, wherein said cytokine is IL-6.

  4. The method of claim 2, wherein said vector is a viral vector

COMPOSITION OF MATTER CLAIMS

- If the composition is in the public domain for any purpose, one cannot get a claim to the composition per se
- But, can get a composition claim to
  - A new formulation of the composition
  - A combination of a delivery device and the composition provided the above are novel and non-obvious

COMPOSITION OF MATTER PATENT

US005266702A

United States Patent [19]

Bhaskaran et al.

[11] **Patent Number: 5,266,702**

[45] **Date of Patent: Nov. 30, 1993**

[54] **1,3-OXAZOLINE COMPOUNDS USEFUL AS ANIONIC INITIATORS SUITABLE FOR POLYMERIZATION OF VINYL POLYMERS**

[75] Inventors: **Durairaj Bhaskaran; Pradeep K. Dhal; Sanjay P. Kashikar; Ratnaprabha S. Khisti; Babanrao M. Shinde; Swaminathan Sivaram**, all of Maharashtra, India

[73] Assignee: **Council of Scientific & Industrial Research**, New Delhi, India

[21] Appl. No.: **585,683**

[22] Filed: **Sep. 19, 1990**

[51] **Int. Cl.**[5] **C07D 263/32**

[52] **U.S. Cl.** **548/235**; 546/145; 558/443; 560/105

[58] **Field of Search** 548/235

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,391,814	7/1983	Vorbruggen	548/239
4,574,157	3/1986	Homann	548/239

Primary Examiner—C. Warren Ivy
Assistant Examiner—James H. Turnipseed
Attorney, Agent, or Firm—Ladas & Parry

[57] **ABSTRACT**

Disclosed are reactive anionic initiators of the general formula $[ArCHR_1R_2N(R_3R_4R_5R_6]$ wherein Ar=phenyl, substituted phenyl, or a heterocyclic compound, $R_1=R_2=H$, ester, cyano, alkyl, aryl, 1,3-oxazoline, N,N-dimethyl amide and other similar alpha activating groups, or combination of them, or one of R_1 or R_2 together with Ar, where Ar is a phenyl or substituted phenyl, is a nitrogen atom containing heterocyclic compound and the other being a nitrile group, R_3, R_4, R_5 and R_6 may be same or different and represent substituted alkyl, cycloalkyl, arylalkyl or aryl or to of the R_3, R_4, R_5 and R_6 together with nitrogen atom form a heterocycle with the condition that the sum of all carbon atoms of all R_3, R_4, R_5 and R_6 is from 12 to 50 and no more than one of the R_3, R_4, R_5 and R_6 is an aryl derivative. The initiators which are in the form of solids or liquids are insoluble and can be incorporated which enable the synthesis of a wide range of polymers with functional groups. These initiators are useful for polymerizing very reactive vinyl monomers such as nitrile bearing vinyl compounds.

4 Claims, No Drawings

The first Composition of Matter Patent from NCL

toluene/methanol) was added. The reaction mixture was stirred for ½ hour at room temperature and the temperature was slowly raised to +50° C. and maintained for 3 hours at that temperature. Appearance of a deep red coloured solution in indicative of the carbanion formation. The reaction mixture was cooled to room temperature, the solvent was evaporated under vacuum and the product was dried at +40° C. under vacuum. The carbanion salt (tetra-n-butyl ammonium-N-benzoxy-2-cyano-dihydro isoquinoline obtained is a deep red coloured oily residue.

The main advantages of the present invention are:

a) The initiators can be prepared over a temperature range of +50° C. to +90° C.

b) The initiators which are in the form of solids or liquids are isolable and can be conveniently stored at ambient temperature. The initiators can also be prepared in two phase systems containing of an organic and an aqueous phase.

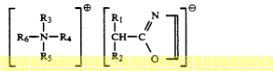
c) They are free from metal ions.

d) Several types of functional groups can be incorporated by using a range of readily available organic compounds as starting materials. These enable the synthesis of a wide range of polymers with functional groups.

e) It is possible to vary the reactivity of the initiators over a wide range by the appropriate choice of substituents in the starting material.

We claim:

1. A reactive anion initiator of the formula:



wherein R_1 is hydrogen and R_2 is selected from the group consisting of hydrogen, $COOC_2H_5$, cyano, alkyl, aryl or 1,3 oxazoline and R_3, R_4, R_5 and R_6 may be the same or different and are each hydrocarbyl of 3 to 16 carbon atoms, with the conditions that the sum of all carbon atoms of R_3, R_4, R_5 and R_6 is from 12 to 50 and that no more than one of R_3, R_4, R_5 and R_6 is an aryl derivative.

2. An initiator as claimed in claim 1 which is a carbanion salt: tetra-n-butyl ammonium 2-benzyl 1,3-oxazoline.

3. A reactive anion initiator of the formula

wherein R_1 is hydrogen and R_2 is hydrogen, aryl or a 1,3 oxazoline group and R_3, R_4, R_5 and R_6 may be the same or different and are each hydrocarbyl of 3 to 16 carbon atoms with the conditions that the sum of all carbon atoms of all R_3, R_4, R_5 and R_6 is from 12 to 50 and that no more than one of R_3, R_4, R_5 and R_6 is an aryl group.

4. An initiator as claimed in claim 3 which is a carbanion salt: tetra-n-butyl ammonium 2-methyl-1,3-oxazoline.

* * * * *

Macromolecules,24(6), 1697 (1991)

POWER OF EXEMPLARY CLAIM : THE CASE OF SOLID STATE POLYMERIZATION OF POLYCARBONATES

PCT WO 9007 536 , July 12 , 1990 to Asahi Chemicals

CLAIMS

1. A porous, crystallized, aromatic polycarbonate prepolymer comprising recurring aromatic carbonate units and terminal hydroxyl and aryl carbonate groups, wherein the molar ratio of the terminal hydroxyl groups to the terminal aryl carbonate groups is from 5/95 to 95/5, and having a number average molecular weight of from 1,000 to 15,000, a specific surface area of at least 0.2 m^2/g and a crystallinity of at least 5 %.

2. A prepolymer according to claim 1, wherein the specific surface area of the prepolymer is at least 0.5 m^2/g.

Lesson : Understand the power/drafting of exemplary claims; Well drafted exemplary claims give you the power to effectively exclude others

WHAT IS PRIOR ART?

- A disclosure (your own, or a third party disclosure) in the public domain that either discloses your claimed invention, or renders it obvious
- Can be the same as a publication, i.e.:
  - A journal article
  - A meeting abstract
  - A poster or presentation at a meeting
  - A sequence in a database
  - A published patent application or issued patent
  - Use or sale of the invention

PRIOR ART

- Novelty can only be destroyed by one prior art reference
- Obviousness can be alleged using one or a combination of several references

WHAT IS A PUBLICATION – A PUBLIC DISCLOSURE ?

- It is not merely something which is published in a journal

- Publications include the following:

  - Scientific articles
  - A thesis which is cataloged and available in a library
  - Abstracts which describe data in a poster or talk
  - The abstract of a Government Agency Grant as soon as it has published, and the Grant itself, but only after the Grant has been awarded
  - A public talk or poster which is open to people outside your own institution at which notes can be taken
  - A “chat” with a prospective licensee in the absence of a Confidentiality Agreement (CDA)

PRIOR ART SEARCH

- With more than 8 million granted patents placed into more than 450 classes and 450,000 subclasses of inventions, how do we locate those inventions *most similar* to our ideas in the Patent databases?!
- Start your search from a known piece of information – a patent number, inventor name, company or university. Look at their inventions that are similar to yours, and the classifications for those inventions.
- Search the patent databases using likely keywords or combinations, and examine the resulting 'hits' for similarity; then look at the classifications on the most similar patents.
- Use the Patent Classification tools – http://www.uspto.gov/patents/resources/classification/index.jsp

FROM THE MOST SPECIFIC TO THE MOST GENERAL

- Start your search from a known piece of information – a patent number, inventor name, company or university. Look at their inventions that are similar to yours, and the classifications for those inventions.

- Search the patent databases using likely keywords or combinations, and examine the resulting 'hits' for similarity; then look at the classifications on the most similar patents.

- Use the Patent Classification tools – http://www.uspto.gov/patents/resources/classification/index.jsp

FACTORS TO CONSIDER IN DECIDING TO FILE

- Nature of invention
- Fit with business interest
- Economic value of the invention
- Other patents that might limit the freedom to practice (dominating patents)
- Patent confers the right to exclude others from practicing the invention, not a right to use it
- Is it for offensive or defensive purpose?
- Are there other patents in the field held by same inventors?

<u>Decision to file</u>

Business decision

Economic incentive

PROVISIONAL vs. COMPLETE PATENT APPLICATIONS

Provisional Application

- Secures a priority date for the subject matter which is disclosed therein, but no more than this
- No claims are required
- Is not examined by the Patent Office
- Expires after one year from the filing date unless it is converted to a traditional application
- Small filing fee, no oath or declaration required
- May be used as a priority document for foreign filed application

PROVISIONAL vs. COMPLETE PATENT APPLICATIONS

Complete applications

- Secures a filing date for the claims and any disclosed embodiments of the claims
- At least one claim is required
- Is examined by the Patent Office
- Proceeds through the process of prosecution until issue or abandonment
- Filing fee depends on the number and type of claims filed; Oath or declaration is required
- May be used as a priority document for foreign filed applications

PROVISIONAL vs. TRADITIONAL PATENT APPLICATIONS

- **Provisional Application**

- Secures a priority date for the subject matter which is disclosed therein, but no more than this
- No claims are required
- Is not examined by the Patent Office
- Expires after one year from the filing date unless it is converted to a traditional application
- Small filing fee, no oath or declaration required
- May be used as a priority document for foreign filed application

WHO iS AN INVENTOR ?

- An inventor is one who conceives a definite and permanent idea of an operative invention, including every feature of the subject matter to be patented
- Provider of the idea / concept
- Members of team who made significant conceptual contributions
- Every team member should have his own notebook or document to record his contribution, dated, signed and witnessed
- If you design an experiment for someone else to perform enter your instructions into your notebook

Patenting defines an individual as an inventor ; as a currency or a visiting card, patents add credibility to an individual as an inventor

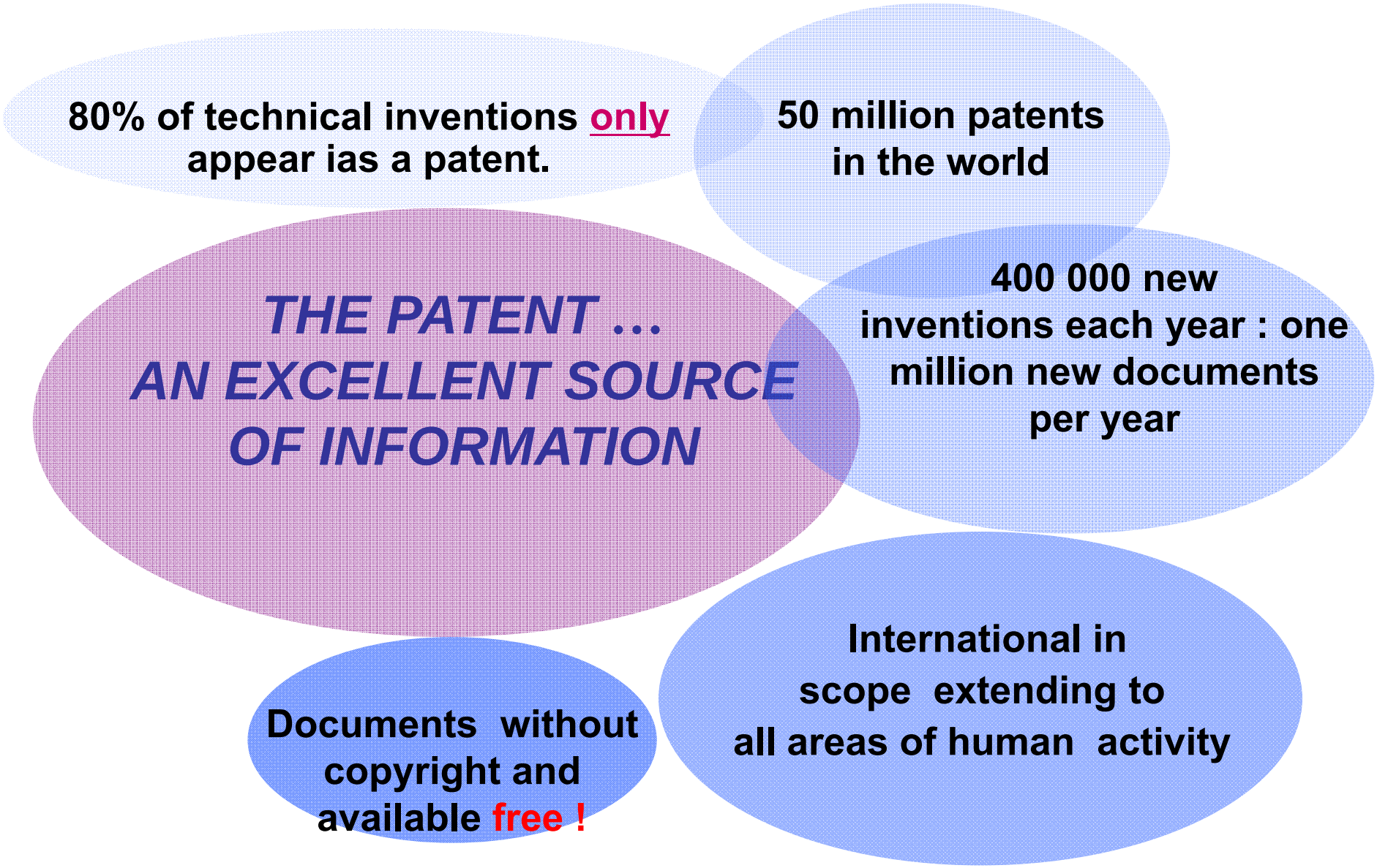
AN INVENTOR VERSUS AN AUTHOR

- The Inventor invents
- The author contributes to a discovery, where the contribution may or may not rise to the level of invention
- Sometimes they are the same thing, sometimes they are not

HOW CAN YOU BECOME AN INVENTOR ?

- Learn about legendary inventions and inventors
- Make patent part of your everyday life
- Treat what is known with irreverence
- Cultivate an open and curious mind
- Cultivate broad interest in subjects, sometimes even far removed from your own area of specializations
- Consider strange and unusual combinations
- Play around with ideas and things
- Doggedly follow questions, doubts and hunches
- Make questions and problems bigger
- Ask for help from those who do know nothing
- Believe in your own creative vision

PATENT AS AN INFORMATION TOOL



PATENT ACTIVITY TRACKING …….

- Enables identification of institutions that are loci of inventive activity
- Provides a measure of productivity of an organization's S&T human resource
- Share of foreign patenting by domestic inventors highlights a nation's attractiveness as a market for new technologies

PATENTS AS A SOURCE OF INFORMATION FOR COMPETITIVE ASSESSMENTS/INTELLIGENCE

- Patents are a valuable source of information to track technology trends
- 70 to 80% of technical inventions only appear in writing as a patent.
- Science as evidenced in patents is often never published; even when published it is after a long gap
- Systematic “patent watch” can lead to valuable insights into competitive strengths of companies
  - Intensity of R&D in a given area
  - “Peaks” and “troughs” corresponding to waxing and waning of technology interests
  - Identification of ‘hot’ areas of research
  - Identification of “Invention and Innovation gaps”
  - Identification of new science leading to technology

PATENTS AS A SOURCE OF INFORMATION FOR COMPETITIVE ASSESSMENTS/INTELLIGENCE

- Patents are a valuable source of information to track technology trends
- Systematic "patent watch" can lead to valuable insights into competitive strengths of companies / individuals/ institutions

When was research initiated ?

What is the current trend in volume of research?

Where is research being conducted ?

Who is conducting the research ?

What is the Intensity of R&D in a given area ?

Peaks and troughs in technology life cycle

Identification of Invention and Innovation gaps

Identification of new science leading to technology

RESEARCH, TECHNOLOGY AND INNOVATION : ENABLING SYSTEMS AND PROCESSES

- Knowledge Management
- IP Management
- Project Portfolio Planning and Management
- Talent Management

IP MANAGEMENT : CREATE AND MANAGE INTELLECTUAL ASSETS

- Company wide IP policy and strategy
- Portfolio planning and ring fencing strategies
- Disclosure pipeline and decision to file
- Competitors activity assessment and mapping
  - identify key technologies of future value
  - identify early threats to your research
- IP education and training

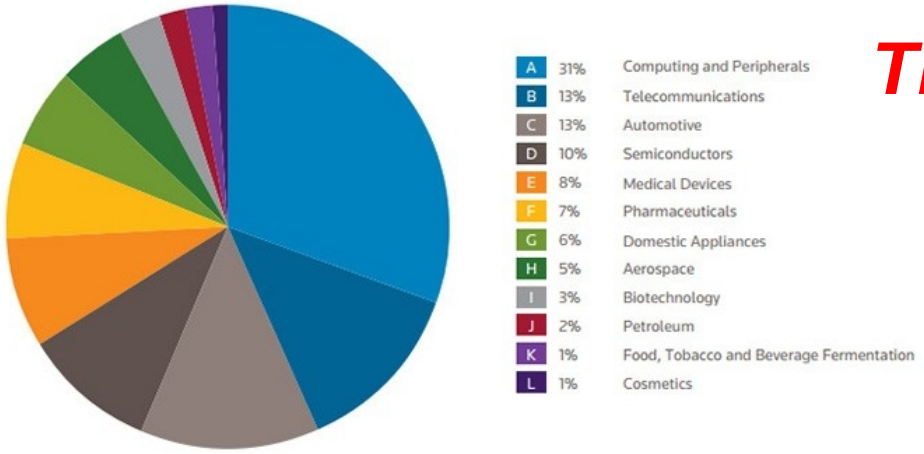
Future wars will not be fought over territories but over ownership and exploitation of ideas

WIDELY USED INFORMATION RESOURCES

THOMSON INNOVATION®

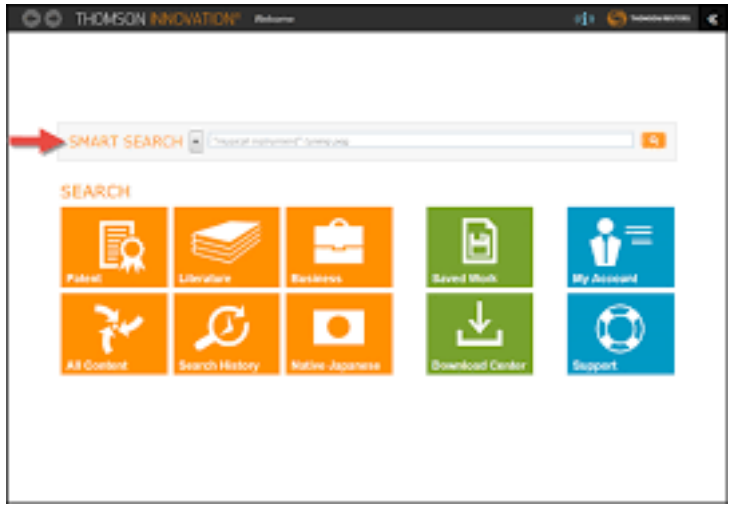
2013 PATENT ACTIVITY

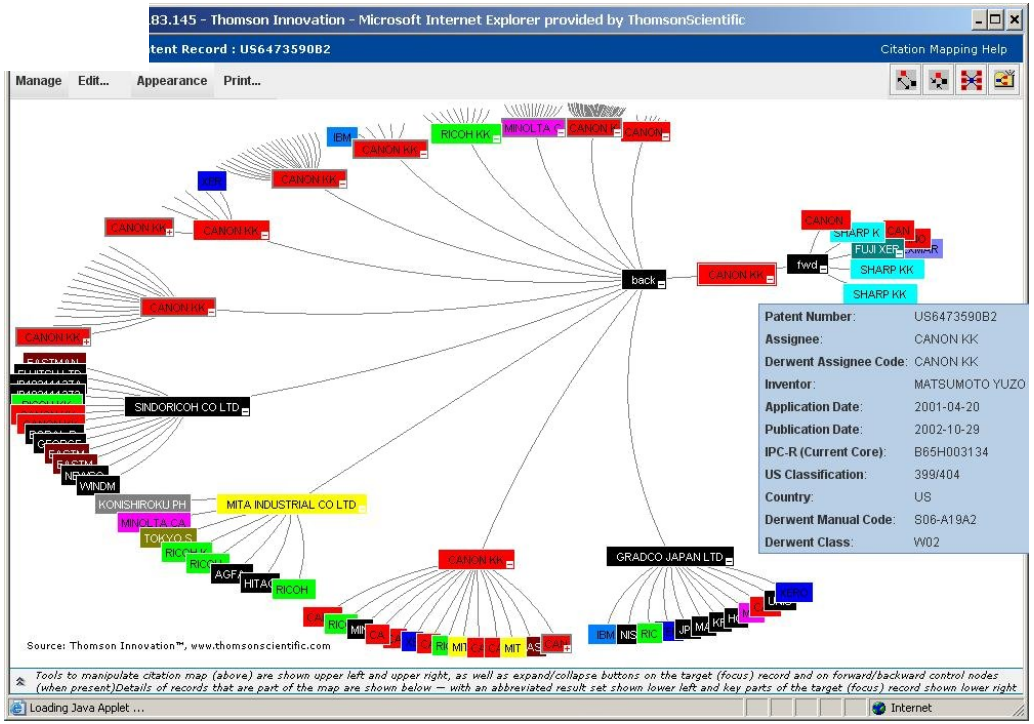
OVERVIEW OF 12 KEY TECHNOLOGY AREAS



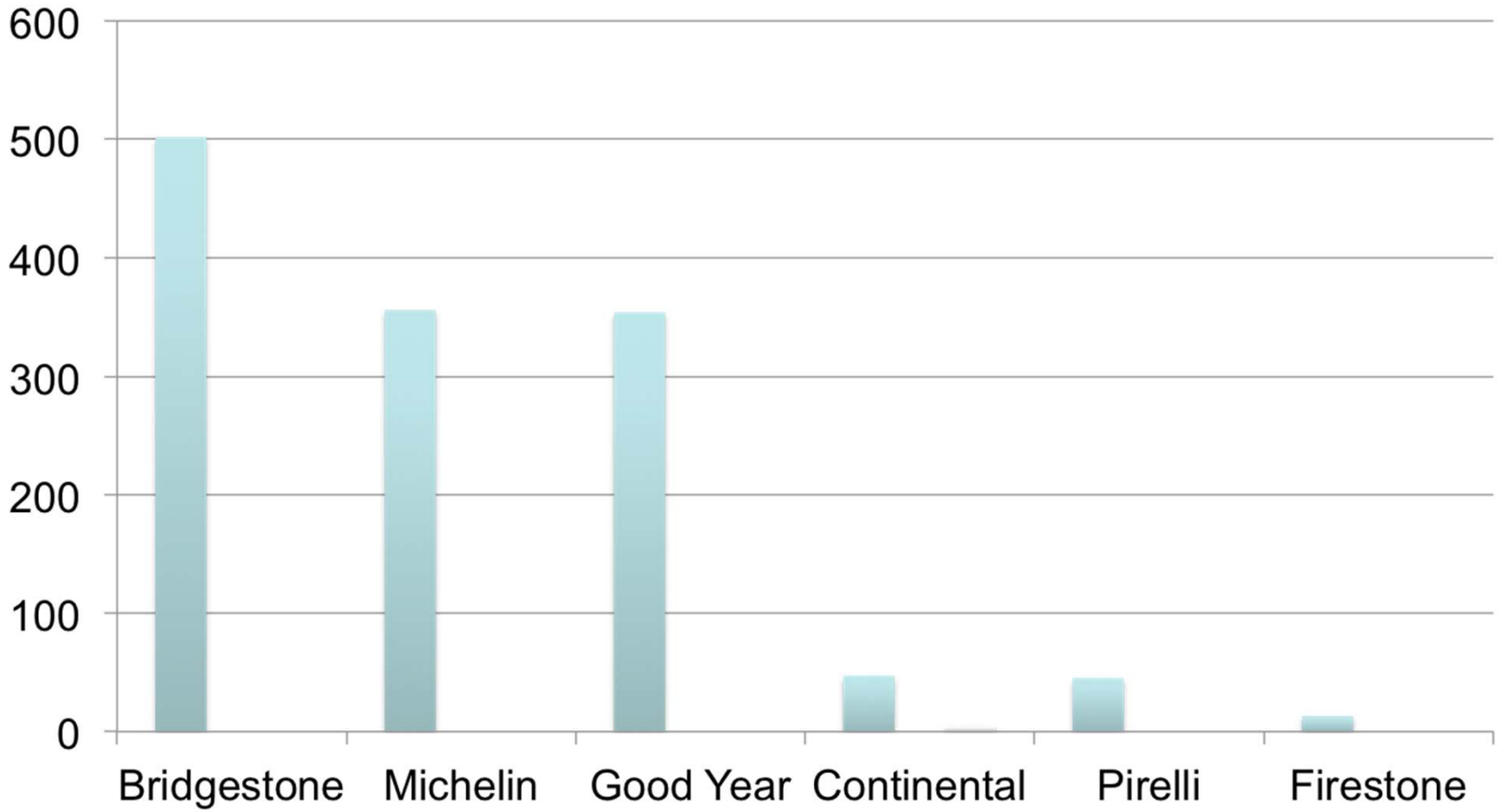
Source: Thomson Reuters Derwent World Patents Index

THOMSON INNOVATION: VERSATILE TOOL TO SEARCH PATENTS

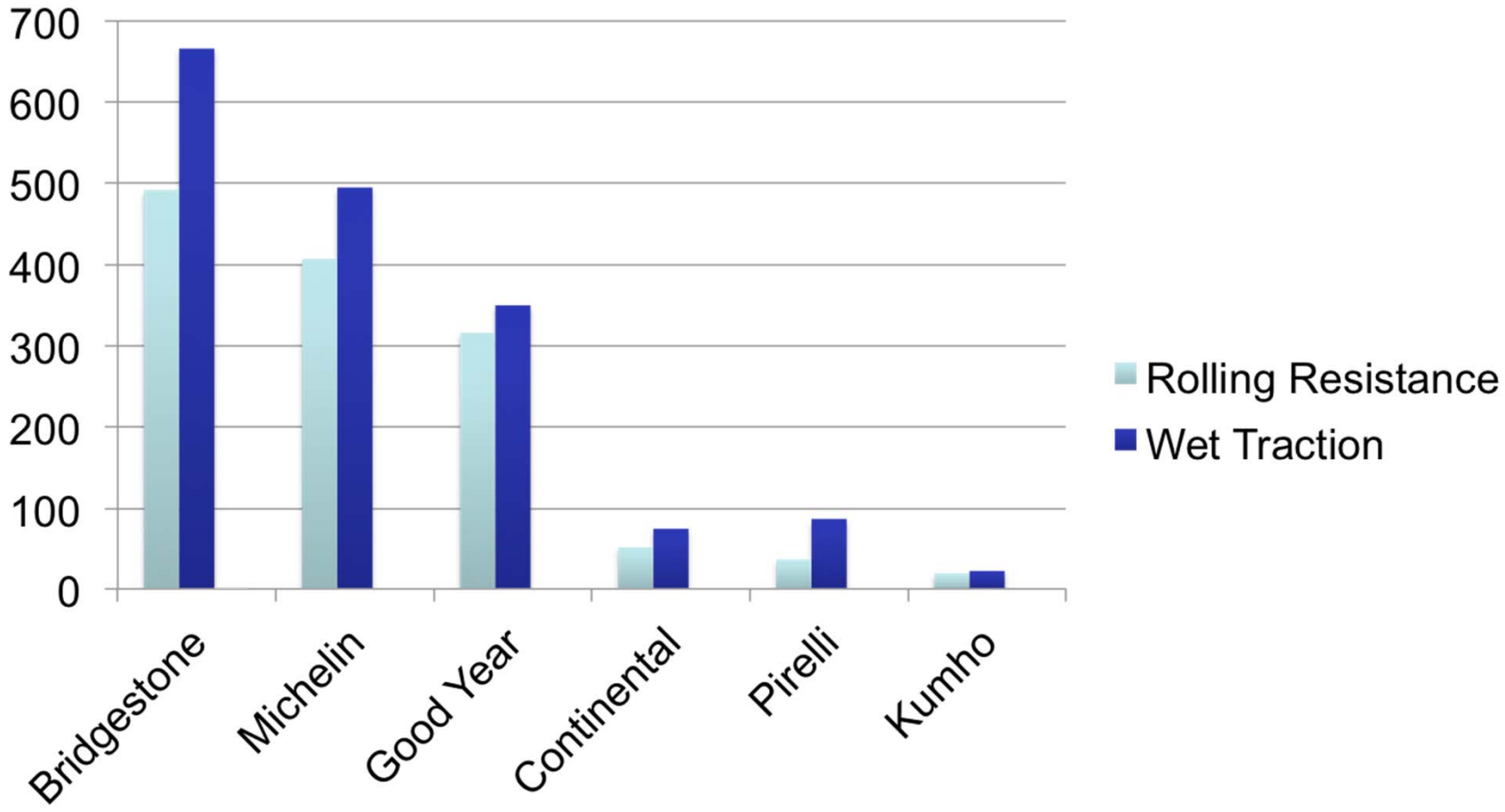




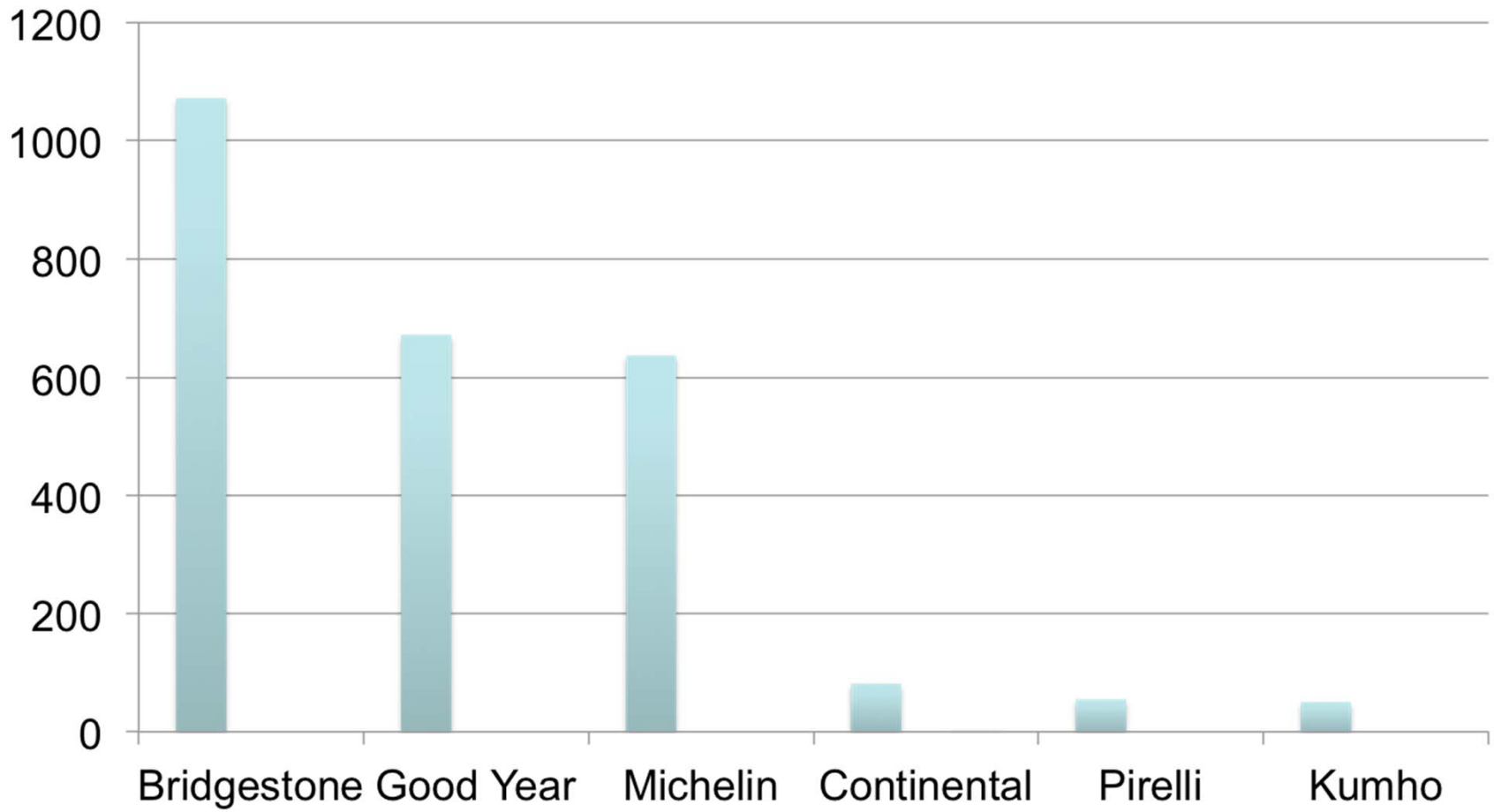
SILICA FILLER: US PATENTS, 2005-2015



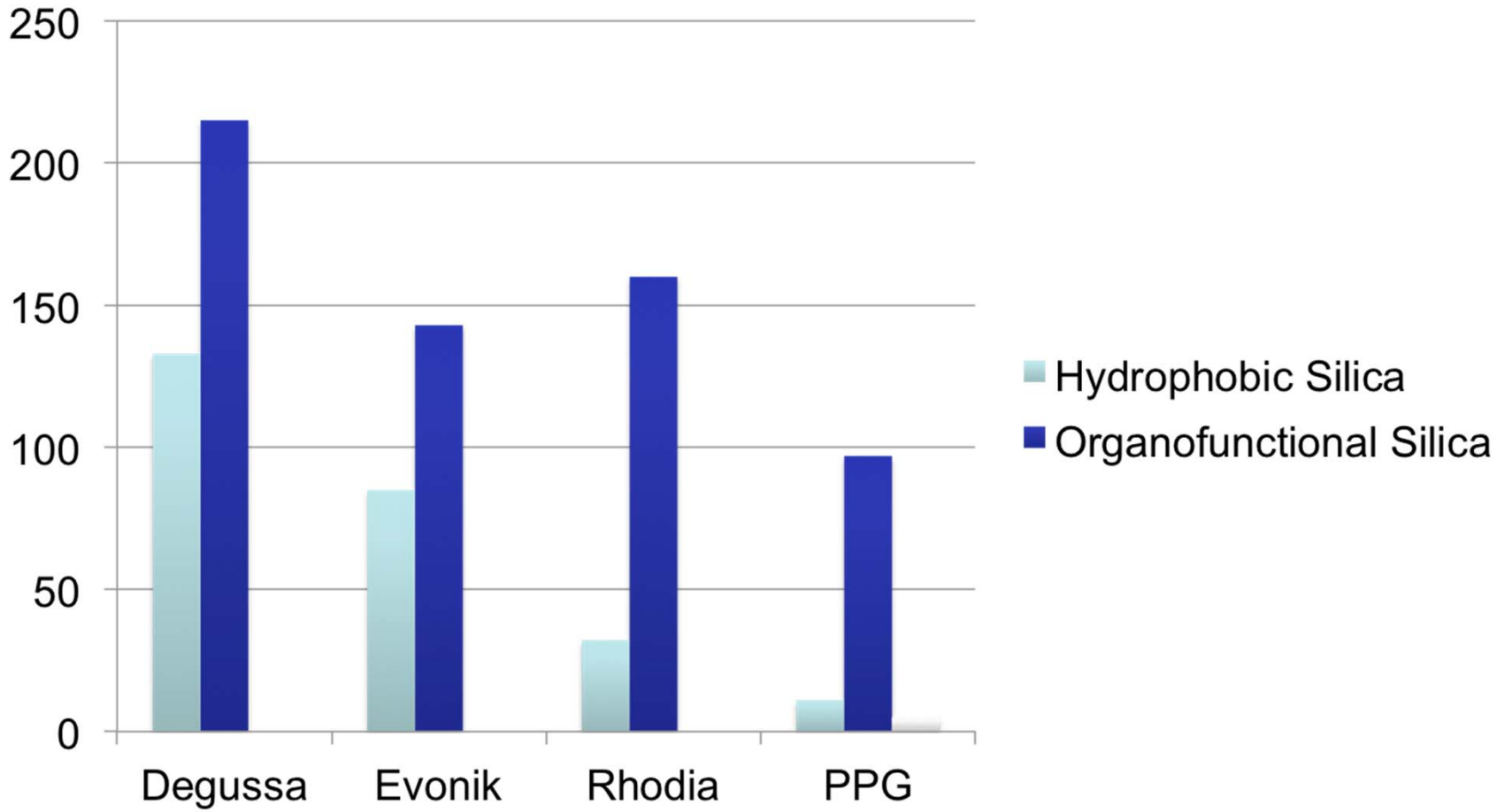
ROLLING RESISTANCE AND WET TRACTION: US PATENTS, 2005-2015



FUNCTIONAL SBR: US PATENTS, 2005-2015



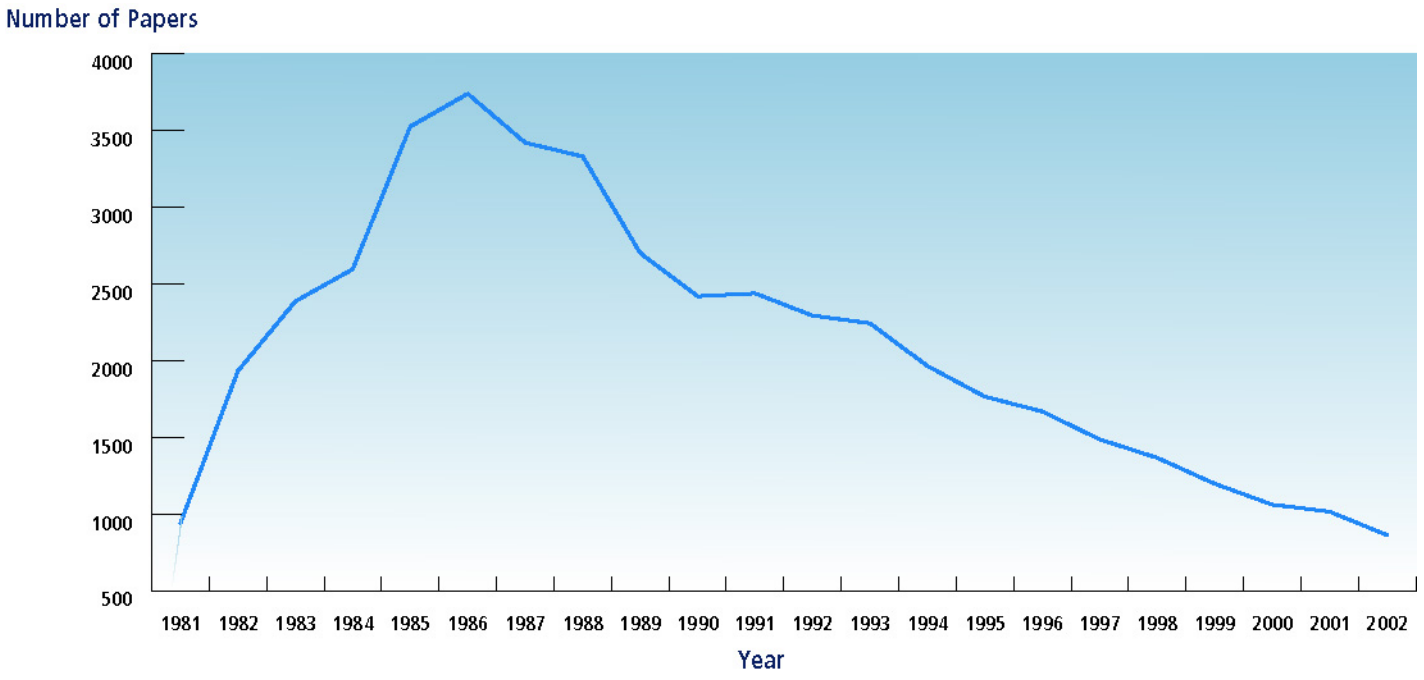
HYDROPHOBIC AND ORGANOFUNCTIONAL SILICA: US PATENTS 2005-2015



TYPES OF PATENTS

- Science led : Disruptive
- Technology led : Incremental

WHEN WAS RESEARCH INTO MONOCLONAL ANTIBODIES INITIATED; WHAT ARE THE CURRENT TRENDS?



Source: ISI Essential Science Indicators

WHO IS CONDUCTING RESEARCH?

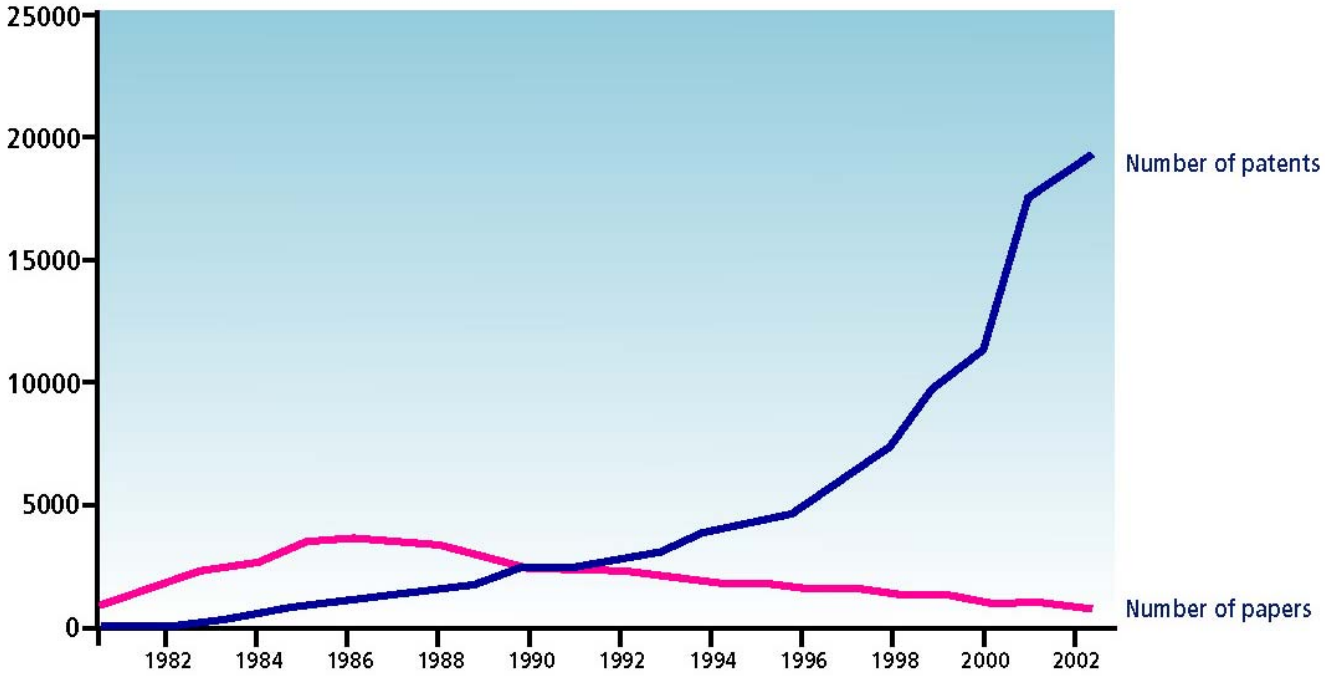
Scientific literature analysis of academic institutions

Rank by Total Cites (1981-2003)			
organization	cites	papers	cites/paper
HARVARD UNIV	55937	1123	49.81
NCI	43348	964	44.97
UNIV WASHINGTON	24424	542	45.06
STANFORD UNIV	23370	457	51.14
UNIV TEXAS	18642	789	23.63
UNIV OXFORD	17707	279	63.47
WISTAR INST ANAT & BIOL	17230	339	50.83
ORTHO PHARMACEUT CORP	15480	97	159.59
MEM SLOAN KETTERING CANC (	14582	508	28.7
UNIV CHICAGO	14109	237	59.53
SCRIPPS CLIN & RES FDN	13919	349	39.88
NIAID	13900	274	50.73
IMPERIAL CANC RES FUND	13686	243	56.32
VET ADM MED CTR	13580	619	21.94
MASSACHUSETTS GEN HOSP	13559	382	35.49
UNIV ALABAMA	12719	359	35.43
UNIV PENN	12672	395	32.08
MRC	12310	213	57.79
DUKE UNIV	11668	412	28.32
UNIV CALIF SAN FRANCISCO	11376	301	37.79

Source: ISI Essential Science Indicators

PATENTING TRENDS – MONOCLONAL ANTIBODIES

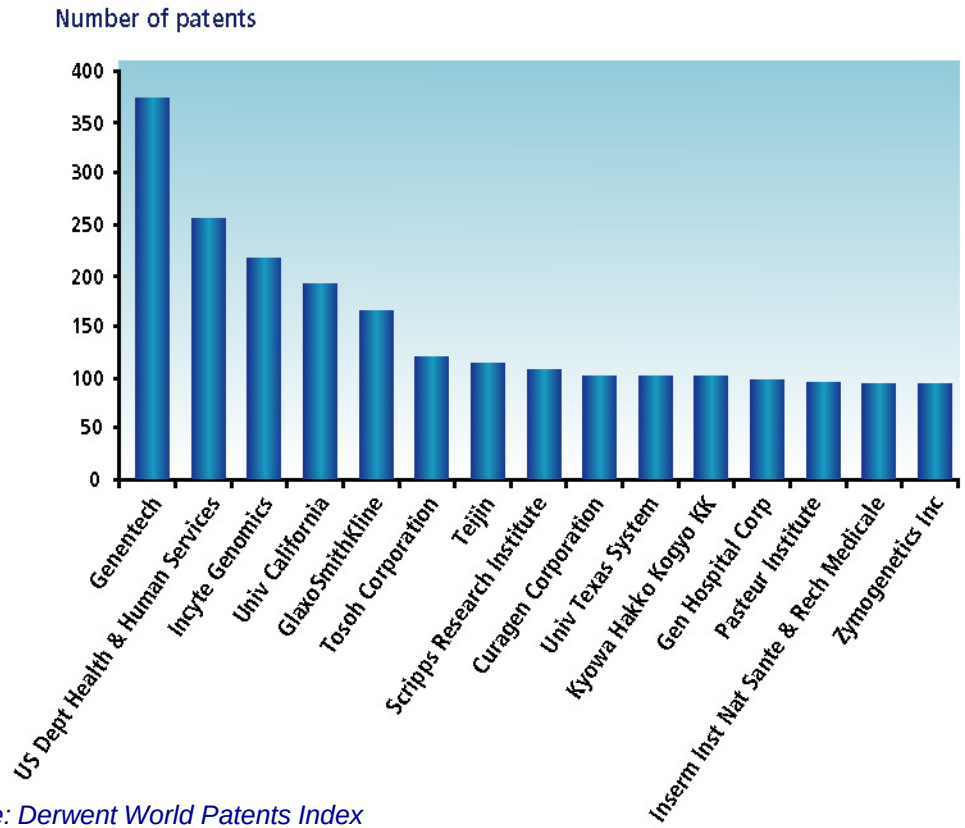
Comparison of papers vs patents on
Monoclonal Antibodies



Source: ISI Essential Science Indicators, Derwent World Patents Index

WHO IS CONDUCTING RESEARCH?

Top 15 organisations patenting Monoclonal Antibodies



Source: Derwent World Patents Index

WHO IS CONDUCTING RESEARCH?

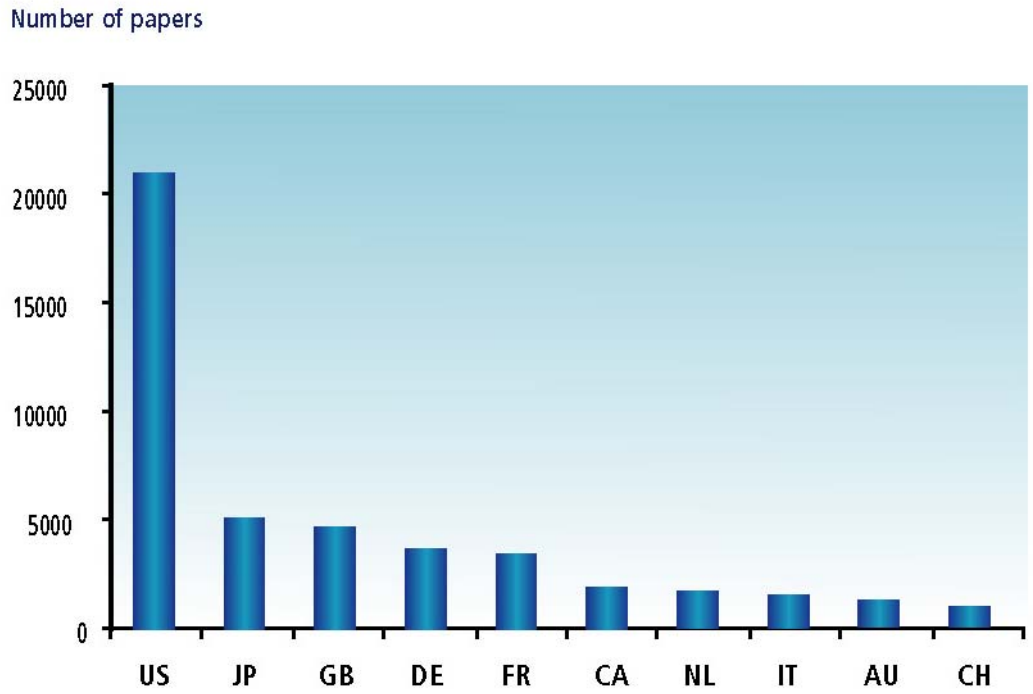
Top 5 organisations patenting Monoclonal Antibodies

Organisation	Number of Monoclonal Antibody inventions	Total number of inventions all subjects	%ge Monoclonal Antibody patents
Curagen Corporation	100	288	34.7%
Genentech	370	1156	32.0%
Protein Design Labs	9	33	27.3%
Incyte Genomics	215	1054	20.4%
Zymogenetics Inc	92	501	18.4%

Source: Derwent World Patents Index

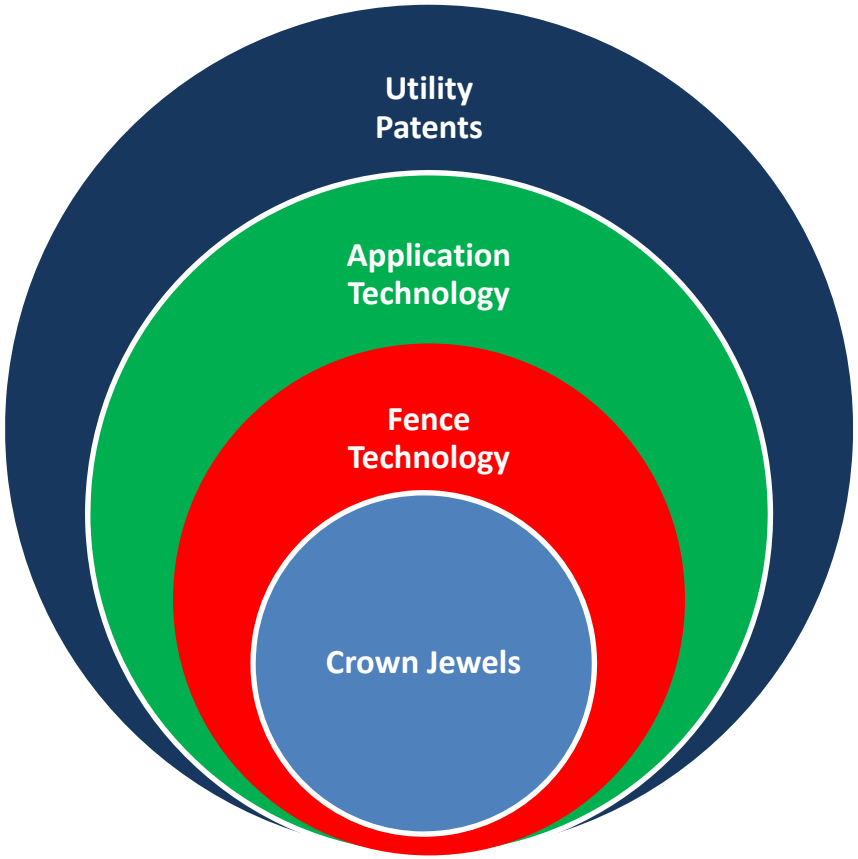
WHERE IS RESEARCH BEING CONDUCTED?

Monoclonal Antibody papers by country



Source: Essential Science Indicators

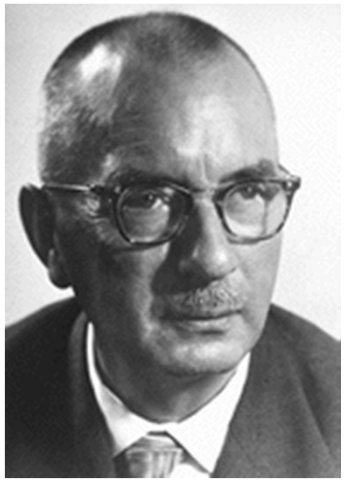
Patenting Strategy

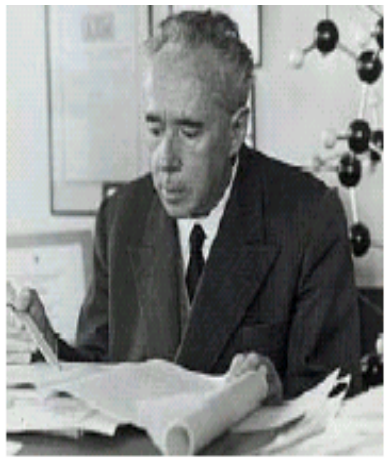


Seminal Patent

- *Technology Innovation*
- *Market Impact*
- *Legal Strength*

METAL CATALYZED OLEFIN POLYMERIZATION





BUNDESREPUBLIK DEUTSCHLAND

AUSGEGEBEN AM 14. APRIL 1960

DEUTSCHES PATENTAMT

PATENTSCHRIFT

Nr. 973 626

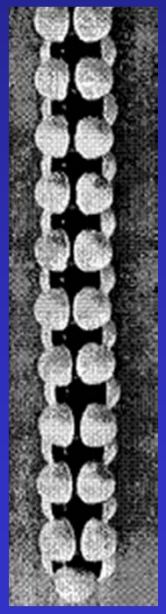
KLASSE 39c GRUPPE 25 01

INTERNAT. KLASSE C 08 f

Dr. Dr. e. h. Karl Ziegler, Mülheim/Ruhr,
Dr. Heinz Breil, Oberhausen (Rhld.), Dr. Erhard Holzkamp, Düsseldorf,
und Dr. Heinz Martin, Mülheim/Ruhr
sind als Erfinder genannt worden

Dr. Dr. e. h. Karl Ziegler, Mülheim/Ruhr

Verfahren zur Herstellung von hochmolekularen Polyäthylenen



CRYSTALLINE HIGH POLYMERS OF α-OLEFINS

Sir:

No crystalline polymers of olefinic hydrocarbons containing asymmetric carbon atoms in the principal chain of the macromolecules have been reported. Such a lack of crystallinity has been explained[1] by considering such polymers as copolymers of two types of random distributed monomeric units, differing only in the configuration of their dissymmetric group.

DE 973626
Nov 18, 1953

G.Natta
JACS 77, 1708, 1955
(March 20, 1955)

ZIEGLER-NATTA CATALYSTS AND POLYMERIZATION: THE BIRTH OF A SCIENCE

Process for preparing high molecular

weight polyethylene,

Ger Pat 973, 626, 1960 dated November 18, 1953

to K. Ziegler, H. Breil, E. Holzkamp and H. Martin

- *Exemplary claim*

  A method for preparing high molecular weight polyethylene

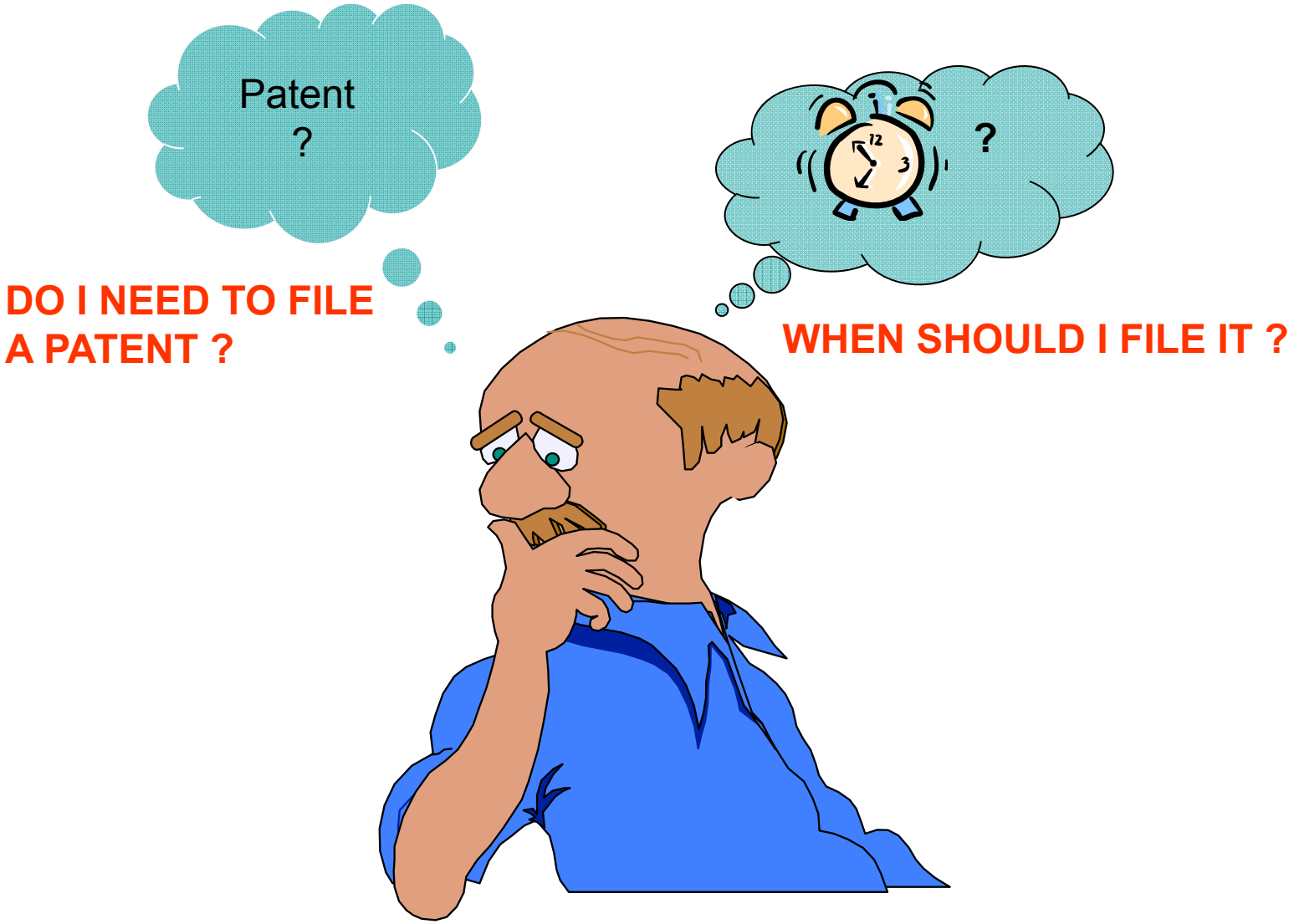
  using aluminum alkyls as catalysts, characterized by bringing together ethylene at pressures >10 atm and temperatures above 50°C with mixtures of aluminum trialkyls and compound of the metals of Group IVa to VIa of the periodic table with the atomic numbers 22 to 74

- Land mark experiment carried out on October 26, 1953, in the Max Planck Institute fur Kohlen forschung in Mulheim an der Ruhr
- A patent was issued to Natta et al (US Pat 3, 112, 200 on June 8, 1954) for the preparation of isotactic polypropylene

INTEGRATING PATENT LITERATURE IN SCIENCE EDUCATION

- Patents are a valuable source of useful information
- Reading, understanding and extracting the information from a patent is an art which can be learnt only by practice
- Seek to find what is not said in a patent, rather than what is said
- One needs comfort with words like, “comprising”, “comprising of” and “consisting essentially of”
- Reading and writing patents is a useful adjunct to the training of a scientists

Integrate patent literature into the literature of science; Encourage patent citations in thesis; Encourage students to write patents


Patent
?
?
DO I NEED TO FILE
A PATENT ?
WHEN SHOULD I FILE IT ?

WHY SHOULD YOU PATENT ?

- Patents provides an inventor opportunities to translate his ideas into useful products or processes.
- Without a credible patent portfolio, an inventor or entrepreneur will find it difficult to attract investment into his venture
- Similarly research scientists and engineers will need patents to attract research collaboration with industry
- Patents have the potential to create incredible wealth to individuals, institutions and companies.
- The quantity and quality of patents define the “Innovation quotient” of an individual, organization or even a nation

LEARNING RESOURCES

TRACKING PATENTS : KEY INFORMATION SOURCES

- Patents.ibm.com
- European-patent-office.org/espacenet
- Patent.gov.UK
- Micropatent.com
- Uspto.gov
- Ipindia.nic.in
- Wipo.int
- Delphion.com
- Scifinder.org
- Ep.dips.org (Japanese/international)
- Derwent. com (14 million patents)
- Nerac.com
- Pl-x.com (patent e-commerce/TRUU metrics)
- Immall.fplc.edu/psa
- Cas.org
- Paterra. com (English translation of Jap. Patents)
- Surfip. com

SELECTED INTERNATIONAL PATENT SITES

- Esp@cenet
  www.worldwide.espacenet.com
- European Patent Office
  www.european-patent-office.org/index.htm
- Japanese Patent Office
  www.jpo.go.jp
- World Intellectual Property Office (WIPO)
  www.wipo.org
  - WIPO Patentscope
    http://www.wipo.int/patentscope/search/en/search.jsf
  - Search WIPO's Intellectual Property Digital Library
    http://ipdl.wipo.int/

US PTO SEARCH TOOLS

- Patent Full-Text and Full Image Databases
  [http://patft.uspto.gov/]
  All U.S. granted patents from 1790!

- Patent Applications and Full Image from 2001
  [http://patft.uspto.gov/]
  All published applications from 2001

- Tools to Help in Searching by Patent Classification
  - http://www.uspto.gov/web/patents/classification/
  - Manual of Classification, List of Classes, Index of Classes, Class Definitions, etc.

- How to Access and View Full-Page Images
  http://patft.uspto.gov/help/images.htm
  Good source for a (free!) recommended TIFF-file viewer software named Alternatiff.

US PTO WEB SITES

- USPTO Patents Main Page
  http://www.uspto.gov/patents/index.jsp
- USPTO Resources and Guidance
  http://uspto.gov/patents/resources/index.jsp
- General Information Concerning Patents
  http://www.uspto.gov/patents/resources/general_info_concerning_patents.jsp
- Pro Se and Pro Bono
  The page for those inventors either filing on their own behalf (pro se) or seeking free or greatly reduced services from patent professionals.
  http://www.uspto.gov/inventors/proseprobono/index.jsp
- The Inventors Eye
  The USPTO's bimonthly publication for the independent inventor community
  http://www.uspto.gov/inventors/independent/eye/index.jsp
- Trademark Information Network (TMIN) Videos
  http://www.uspto.gov/trademarks/process/TMIN.jsp

IMPORTANT WEBSITES

- U.S. Copyright Office
  www.copyright.gov/
  (especially see Circular 1, "Copyright Basics")
- Google Patent Search
  http://www.google.com/patents
- Inventors Network
  www.inventnet.com

SELECTED WEB PAGES

- Lemelson-MIT's Handbook for Inventors
  http://web.mit.edu/invent/h-main.html

- Intellectual Property Basics from the U. of New Hampshire School of Law (formerly Franklin Pierce Law Center)
  http://law.unh.edu/thomasfield/ipbasics/index.php

- Pat2PDF – Free full-text U.S. Patent copies downloadable as PDF files; excellent for printing or emailing!
  www.pat2pdf.org

- Free Patents Online , a non-USPTO website along with the Esp@cenet database. Export US patents and applications into .xls files for easier sorting and analysis.
  www.freepatentsonline.com

SELECTED PATENT SEARCH TUTORIALS

- Basic Patent Training for the Independent Inventor and Small Businesses' (USPTO)

  https://uspto.connectsolutions.com/certificationpackage/

- Patent Searching on the Internet – Dave Morrison, University of Utah (Salt Lake City PTRC)

  http://video.google.com/videoplay?docid=74991917073536005 3#

- Patent Searching video (Auburn PTRC)

  http://diglib.auburn.edu/tutorials/uspto6.htm

- Preliminary Patent Searching on the Web (Stillwater PTRC)

  http://www.library.okstate.edu/patents/services.htm

- University of Central Florida Patent Tutorial (Orlando PTRC)

  http://library.ucf.edu/GovDocs/PatentsTrademarks/default.asp

- Patent Searching Using the Esp@cenet Patent Database

  http://www.european-patent-office.org/wbt/espacenet/

SELECTED PATENT AND TRADEMARK RESOURCE CENTERS

- University of Utah
  http://campusguides.lib.utah.edu/content.php?pid=71473
- Georgia Tech (Atlanta)
  http://www.library.gatech.edu/research_help/subject/index.php?/patents
- University of Michigan (Ann Arbor)
  http://guides.lib.umich.edu/content.php?pid=35640
- Oklahoma State University (Stillwater)
  www.library.okstate.edu/patents/index.htm
- University of Texas (Austin)
  http://www.lib.utexas.edu/engin/patent/index.html

Entrance to the US patent Office, Washington DC

THANK YOU

US 6469 Manner of Buoying Vessels
issued to Abraham Lincoln, May 22, 1849