SENSITIZATION WORKSHOP ON

"INTELLECTUAL PROPERTY TECHNOLOGY MANAGEMENT & ENTREPRENEURSHIP"

15th December 2012

Organised by

Biotechnology Industry Research Assistance Council

(A Government of India Enterprise, New Delhi)

Organized at

Centre for Converging Technologies,
University of Rajasthan, Jaipur

"*Entrepreneurship in Biotechnology & BIRAC Initiatives"*

15th December 2012, Jaipur

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Biotechnology Industry Research Assistance Council

Entrepreneurship

- **What is Entrepreneurship**
- **Why it is Important & its Impact**
- **Entrepreneurship in Biotechnology**

What is Entrepreneurship

- Term 'Entrepreneur'- is derived from French 'entreprendre, which means, **'to undertake'.**

- "Entrepreneurship is the professional application of knowledge, skills and competencies of innovative idea by individual or set of people by launching in enterprise, thus to pursue growth while generating wealth, employment and social good". - **National Knowledge Commission India**.

- Crucial characteristics of entrepreneurial activity are: **risk taking, innovation and venturing into new business activities, product development & commerlization.**

Importance & Impact of Entrepreneurship

The Entrepreneur implements **'New innovative techniques & methods'** which plays crucial role in:

a. Introduction and dissemination of **new methods and technology**;
b. Affordable **product development & services**;
c. Increasing opportunities for **employment & skill sets** ;
d. Overall **socio-economical growth of nation**

Entrepreneurship in India

- Crucial efforts by Govt. of India initiated after **economic liberalization**- easy accessibility to finance, institutional & infrastructural support to **'techno-preneurs'**

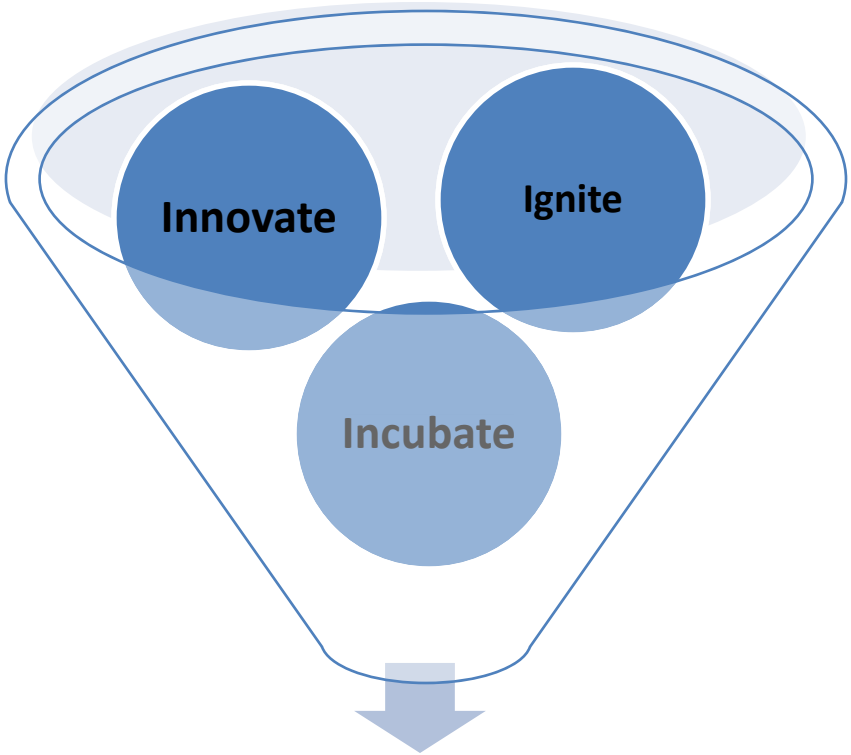
- In recent survey by Deloitte group, **India rank 2nd** globally as home to the **fastest growing technology firms. –** (NKC 2008 Report)

- **High Skill innovation driven Entrepreneurship** is growing as fast pace.

Entrepreneurship in Biotechnology

- Start-up Biotechnology Company
- Company Formation and Organization
- Building a Balanced Team- Scientific & Management
- Intellectual Property Rights & Strategy
- Financing/Venture
- Partnering with Industry
- Licensing and Technology Transfer
- Regulatory Affairs
- Roadmap to future strategy & product commercialization
- Working Toward a Successful Enterprise

The Need- Innovation to Commercialization



Entrepreneurship Development

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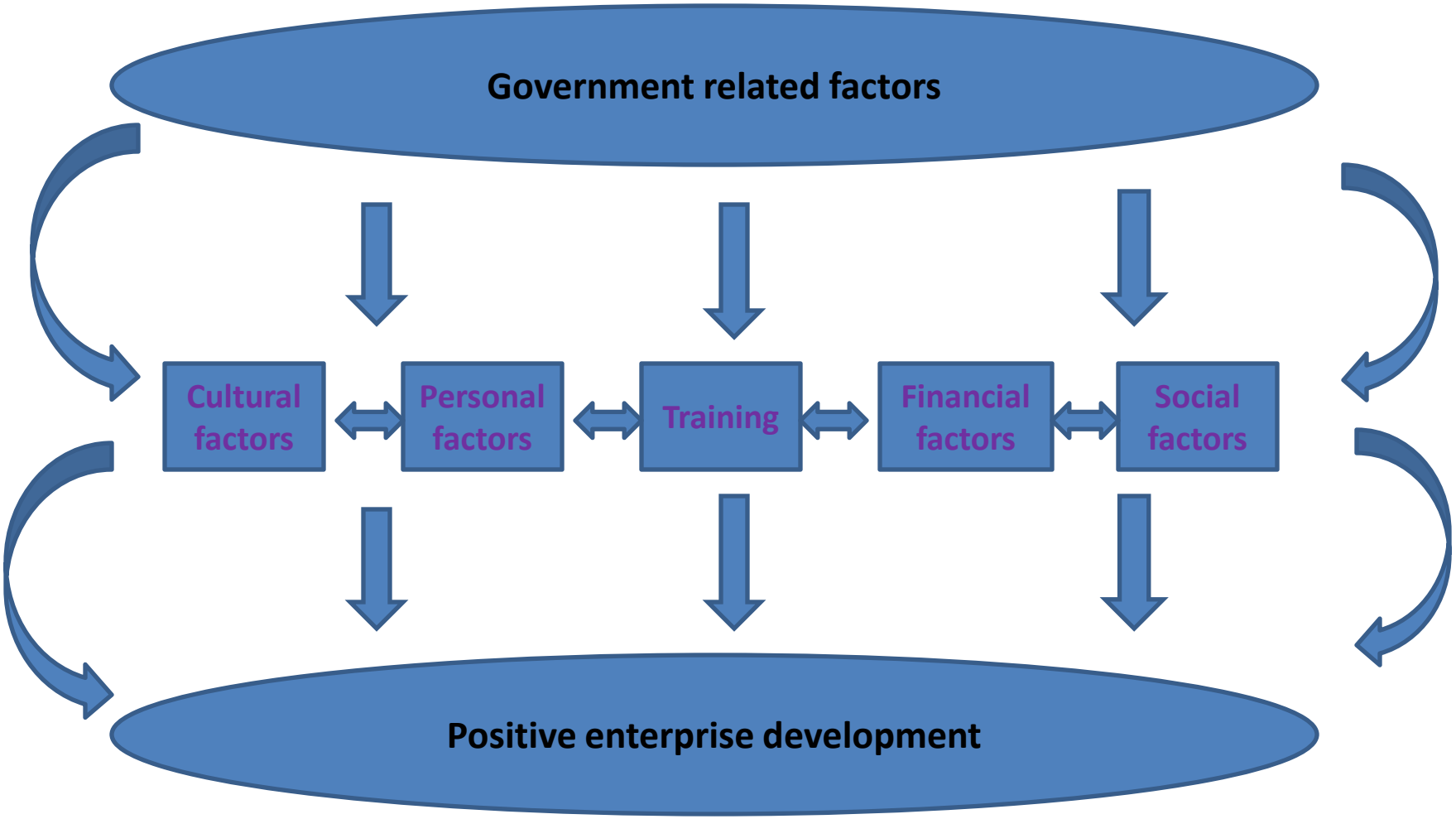
Nurturing Entrepreneurship

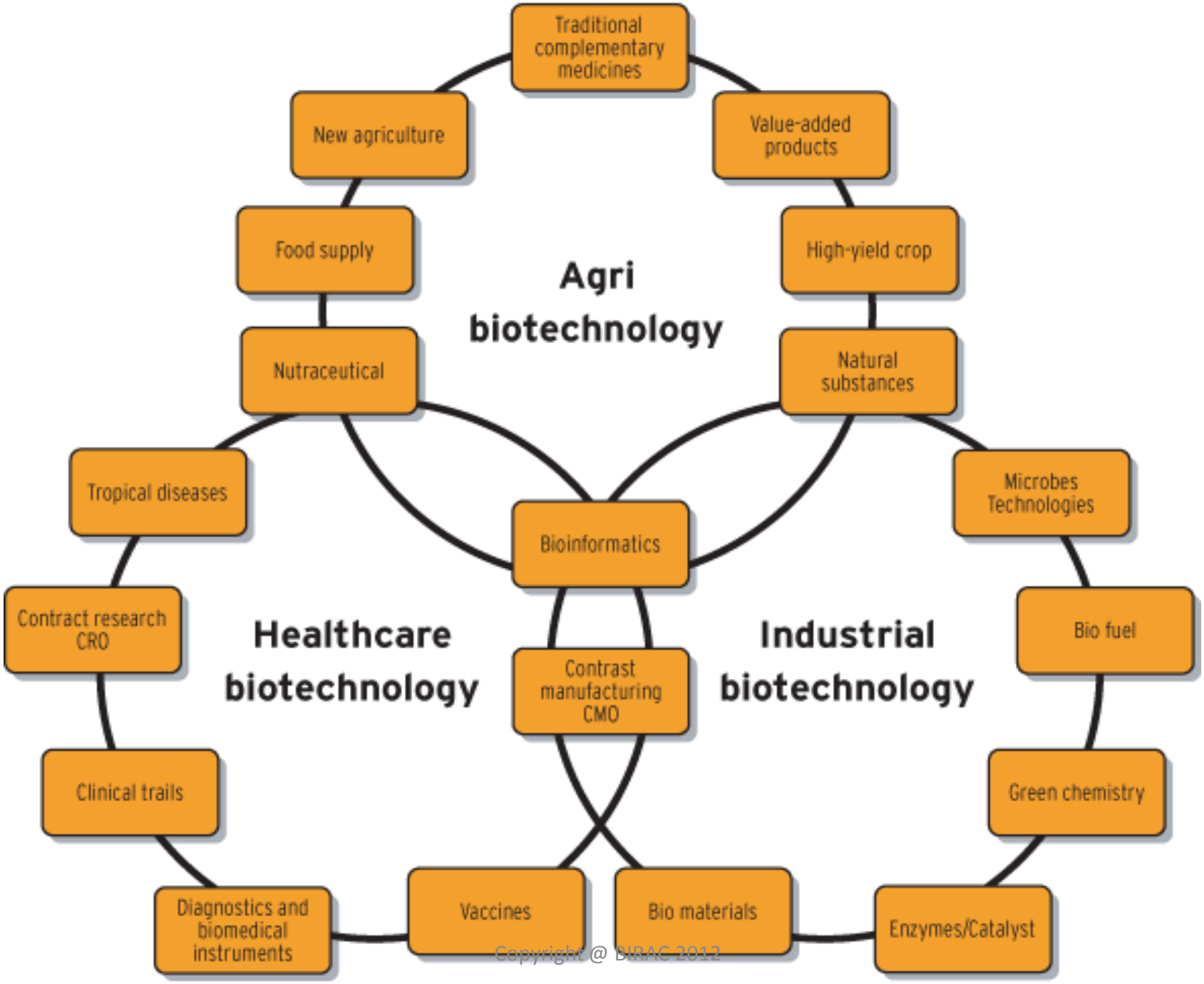
1. **Entrepreneurial motivation**: the social and economic importance of commercialising science and technology; the innovative aspects of it; education & training, role models, examples and discussions.

2. **Opportunity recognition**: this is a very important aspect of entrepreneurship, one needs to "identify" an opportunity that motivates them to pursue it. Opportunities at research and commercial levels.

3. **Commercialisation:** through a variety of methods of technology transfer to different levels of product development. Lectures from practitioners; business plan competitions; short pieces of course work; small group supervisions etc.

Framework For Necessary Factors For Enterprise Development





Government: DBT-BIRAC's Role

- **Linking Education, Innovation and Entrepreneurship – '*Connector and Catalyser*'**
- **Biotech Incubation for Entrepreneurship (BISS Scheme)**
- **Education and Training Support activities to Start-ups & SME's in Biotech**
- **Fostering Innovation and Enterprises Building**
- **Awareness and Capacity Building for new budding Entrepreneurs**
- **Fellowship/Internship programmes**
- **Mentorship and Networking Events**

BIRAC Initiative:

- Supporting Public Private Partnership in Biotechnology research
- Fostering Innovation & Research in Biotechnology
- Promoting Entrepreneur Education & Learning
- Empowering & Mentoring SME's
- Innovators Awards for successful entrepreneurs
- Growth through Regional Partnerships
- International Collaborations

BIRAC Support for taking discovery to product development

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Biotechnology Ignition Grant (BIG) Scheme

Purpose:

Establish and validate of Proof of Concept

Encourage researchers to take technology closer to market through a Start Up

Target Groups:

Entrepreneurs from Academia or an Incubatee

(PhDs, Medical degree holders or M.Tech, Engg. Graduates)

Support:

Grant-in-Aid limited up-to INR 50 Lakh

Mentoring and hand-holding

Supports up-to Proof-of-Concept stage

Small Business Innovation Research Initiative- SBIRI

Purpose:

- Govt. partnership with Industries
- For path-breaking research in frontier futuristic technology areas having major economic potential.
- Focused on IP creation
- IP ownership retained by Indian industry/collaborating scientists.

Target:

- Indian Biotech companies registered under Indian Company Act 1956

Support:

- To nurture high risk, highly innovative accelerated technologies/entrepreneurs
- Support early stage, proof-of-concept research

Over 100 projects from SME's supported

SBIRI deployed $36million of which US$5million was in grant & US$31million as soft loan

Biotechnology Industry Partnership Programme- BIPP

Purpose:

•Govt. partnership with Industries
• *Cost sharing basis*
• For path-breaking research in frontier futuristic technology areas having major economic potential.
• Focused on IP creation
• IP ownership retained by Indian industry/collaborating scientists.

Support:

• For high risk, highly innovative accelerated technology

•For nationally and socially relevant areas, with no assured market.

• Supporting research project for novel IP generation.

Target:

• Indian Biotech companies registered under Indian Company Act 1956

•51% Indian shareholding (including NRI's)
• DSIR recognized R&D

• Apply independently or in collaboration with companies, not for Profit organisation or academics partners

Nearly 100 agreements have been signed with 85 companies with approx. 50 SME's

Investment of US $153million has been committed with US$55 million by Govt. of India with contribution of US$98 million coming in from private sector.

Contract Research Scheme- CRS

Purpose:

Academia-industry interaction
Industry to validate process or partner for specific research

Leads should be at a level which provides sufficient data for Scale up/Validation:

- Exploratory validation of technology
- Small scale contract research resulting in generating several batches of process or multiple prototypes
- Large scale validation of prototype to commercial design

Target Groups-

Research institutes,
Universities,
Public funded research Laboratories,
Governmental organizations,
Research foundations
AND
Companies / industries

Company partner should have DSIR recognized R&D/Service unit(s)

Support:

- Funds for validation of PoC
- IP Services and Management
- Legal support: MTA, NDA, IP protection contracts, Licensing agreements

Bio-incubator Support Scheme- BISS

Purpose:

Strengthening and Up-gradation of the existing Bio-incubators and also to establish New World Class Bio-incubators in certain strategic locations.

Target Groups:

- Existing Bio-incubators across the country
- New Bioincubators

Support:

- Provide incubator space to Start-ups and Entrepreneurs.
- Provide access to a pool of special equipments in the Central Equipment Facility.
- Connect and facilitate Industry – Academia Interaction
- Provide enabling services and required mentorship for IP and Technology Management, Legal and Contract, resource mobilization and networking platform.
- Governance models would be cooperative or autonomous.
- 12 existing Bio-incubator across India has been supported approx. 70,000 sq.ft Bio-Incubator has been created.

Identifying Key Gaps

- Entrepreneurship Development is complex process need to find proper mechanism as per local resources availability
- Enabling Capacity building and Handholding services
- Fostering and encouraging techno- Entrepreneurship in all places research.
- Provide Mentorship & Faculty development programmes.

Strategic Partners

- **Global Partners-** Centre for Entrepreneurship Education at Cambridge University, WHO, Gates Foundation, PATH, etc

- **National Partners-** DBT & Allied Institutes, ICMR, IIT's, Leading Medical & Technological University & Institutions, DBT-BIRAC Supported Bio-Incubators, ISBA, ABLE,BCIL etc.

" I really believe that entrepreneurship is about being able to face failure, manage failure and succeed after failing."

-Kiran Mazumdar-Shaw

CMD-Biocon

THANK YOU

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Jaipur IPR Workshop
15.12.2012

Intellectual Property Rights & Technology Management

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Sensitization Workshop for Academia & SMEs
at
University of Rajasthan, Jaipur
(15.12.2012)

Acknowledgements

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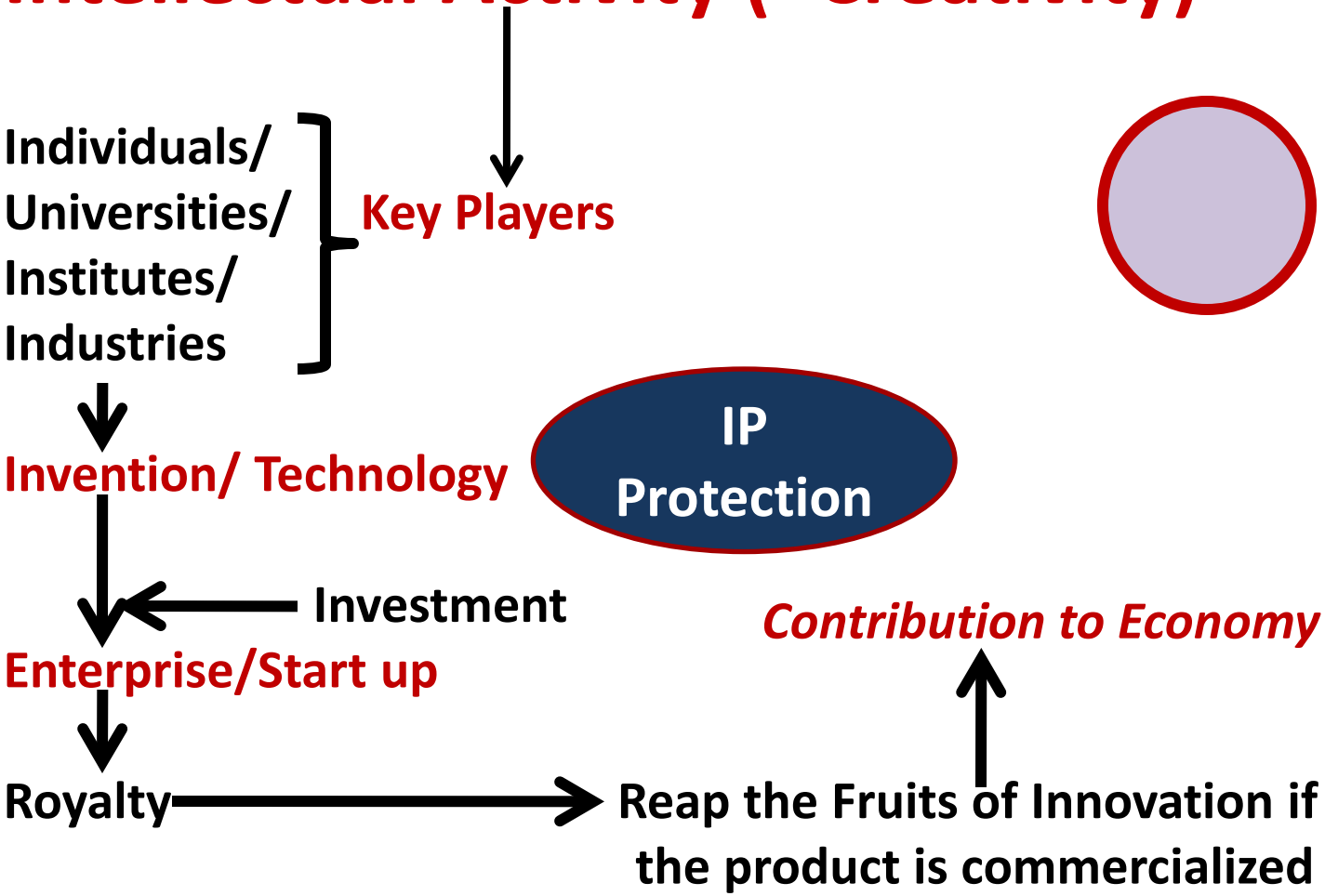
- BIRAC & Dr. Renu Swarup
- Jaipur University
- UK-India Innovation Initiative
- NII
- NIH, USDA, JHU, BU *{Drs. Gerald Keusch, Ashley Stevens & Altaf Lal}*
- Various websites (IPO) , Books
- Several Colleagues

WISH LIST

- ✓ ***Want an ideal Device for Detection of Malaria from Human Saliva***
- ✓ ***Want an Innovative Approach to detect microbes on kitchen slab***
- ✓ ***Want to Detect Cancer from Human Breath***
- ✓ ***Want to Detect Drug Resistant Cerebral Malaria by Staining***
- ✓ ***Dream for Quick Sequencing of Human Genome***

Innovation: an outcome of Intellectual Activity (=Creativity)



Types of Human Creativity !

- Glivec, Immuvac, Humira mAb, Samsung Galaxy Gene Sequencers, PCR machine : **Patents**
- Nescafe; GloFish***/ARTSK_NII/ Prozac/ Tylenol : **Trade Mark**
- Honda Model XX : **Design Registration**
- Internet Explorer, Gene Sequences & Music : **Copyright**
- Coke, Techniques to generate enzymes : **Trade Secrets**
- Traditional Knowledge & Protection of New Plant Varieties
- South Indian Silk sarees/ Bengal cotton cloth : **Geographical Indicators**

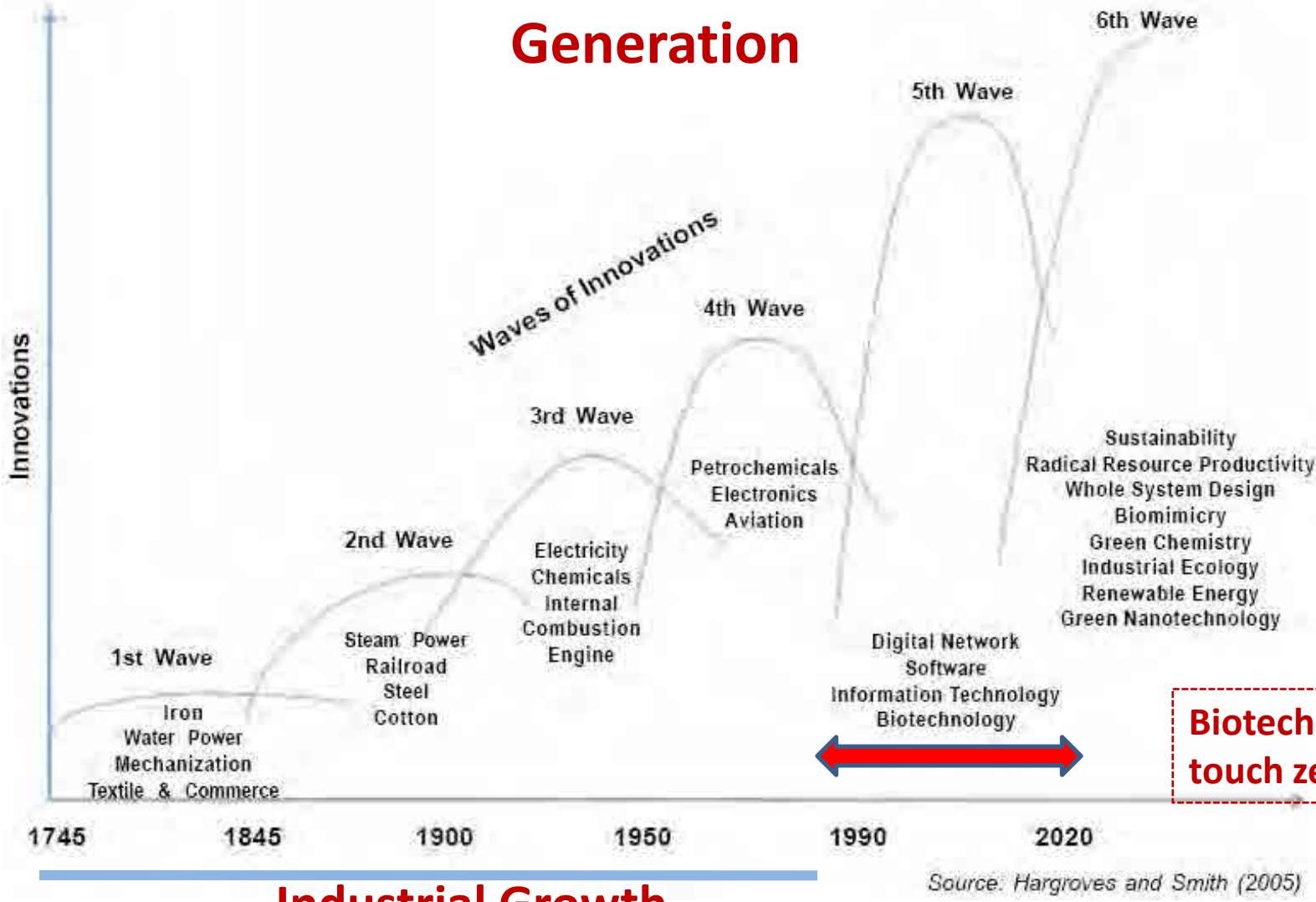
*(***The GloFish is a trademarked transgenic zebrafish (Danio rerio) expressing a red fluorescent protein from a sea anemone under the transcriptional control of the promoter from the myosin light peptide-2 gene of zebrafish1. Produced and patented by a group at the National University of Singapore)*

Intellectual Efforts Generate Technologies (*i.e. generate IP*)

Technologies have been generated under two types of Revolutions:

(A) Industrial Revolution
(B) Knowledge Revolution

Scientific Eras & Technology Generation



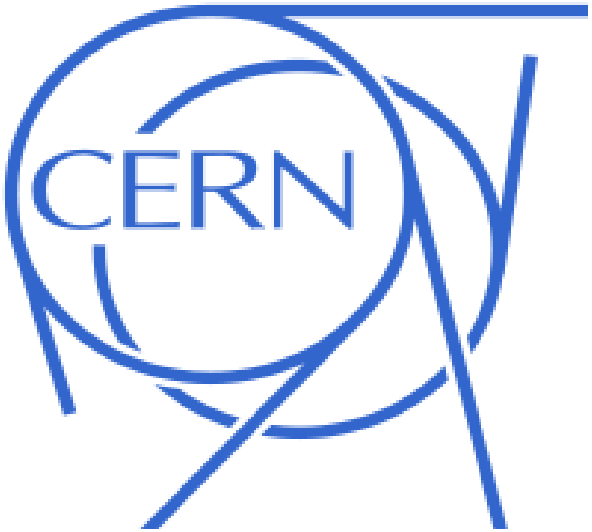
Biotech will touch zenith

Industrial Growth

Knowledge Driven Revolution

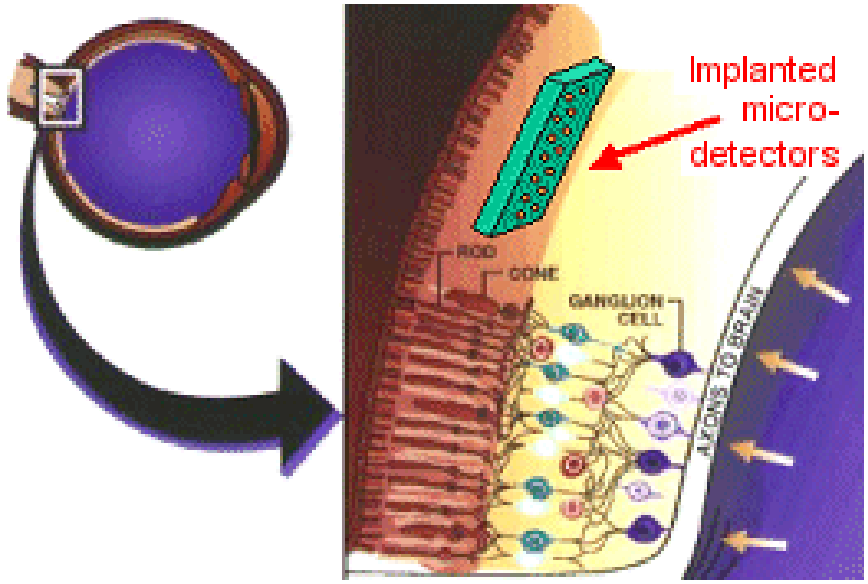
Great Inventions

[www.]



World's First Bionic Eye Approved for Use in Europe [Video] | Fast ...

7 Mar 2011 **... bionic eye** Could blindness soon be a thing of the past? A California company called Second Sight recently received approval in Europe to sell **...** *www.scientificamerican.com/article.cfm?id=steps-owards...**bionic**...*



Researchers create *nano-patch* for the heart

- May 19, 2011
- **Engineers at Brown University have created a nanopatch for the heart that tests show restores areas that have been damaged, such as from a heart attack. Credit: Frank Mullin, Brown University**
- *When someone suffers a heart attack, a part of the heart dies. Nerve cells in the heart's wall and a special class of cells that spontaneously expand and contract – keeping the heart beating in perfect synchronicity – are lost forever. Surgeons can't repair the affected area. It's as if when confronted with a road riddled with potholes, you abandon what's there and build a new road instead.*

What is Intellectual Property? Def.

- **Classical Definition:** ***"A mental or intellectual activity"*** ***which results in a useful Technology related to an industrial design or a machine comprises Industrial Property (=IP).***

- ***IP is generated by Inventors or Innovators*******

- **Over years this term evolved into *Intellectual Property* which includes *Patents, Copyright, Trade Mark, Trade Secrets, Geographical Indicators, Protection of Plant Varieties* etc.**

Relevance of Technologies in Current Global Scenario in Biotech sector

→ Requirement of people friendly technologies for health care/ Agriculture/Environment /Fuels etc

→Growth of biotech institutes in India

→ Increase in number of skilled & semi-skilled people

→ Increase in international & national collaborations

Advantage India

- ***Robust economical scenario***
- **Promising potential to be a global player in the arena of biotechnology**
- **Large pool of skilled and cost competitive manpower**
- **Well developed and integrated scientific infrastructure**
- **Advanced chemical synthesis technologies**
- **Manufacturing practices conforming to US and EU norms**
- **Diverse biological resources**
- **Globally recognized as a producer of low cost, high quality bulk drugs and formulations.**

DBT_BIRAC Support Systems for Innovative Research in India

Funding Support (loans or grants) in INR				
BIG	**SIBRI**	**BIPP**	**CRS**	**BISS**
50 Lacs	**2 Cr**	**50 Cr >**	**Case to case**	**Case to case**

Old vs New

S. No.	Old Technology	New Technology
1.	Test Tube	Eppendorf Tube
2.	Petri Dish	Tissue Culture Flask
3.	External Pace maker	Implantable Pace Maker
4.	Mercury Column B.P. measuring machine	Digital B.P. machine
5.	Drugs	Target Specific Drugs
6.	ELIZA tests	PCR amplified Tests

This makes life more comfortable!!!

High level of Technology : Higher Royalty or Prices

Investment Opportunities

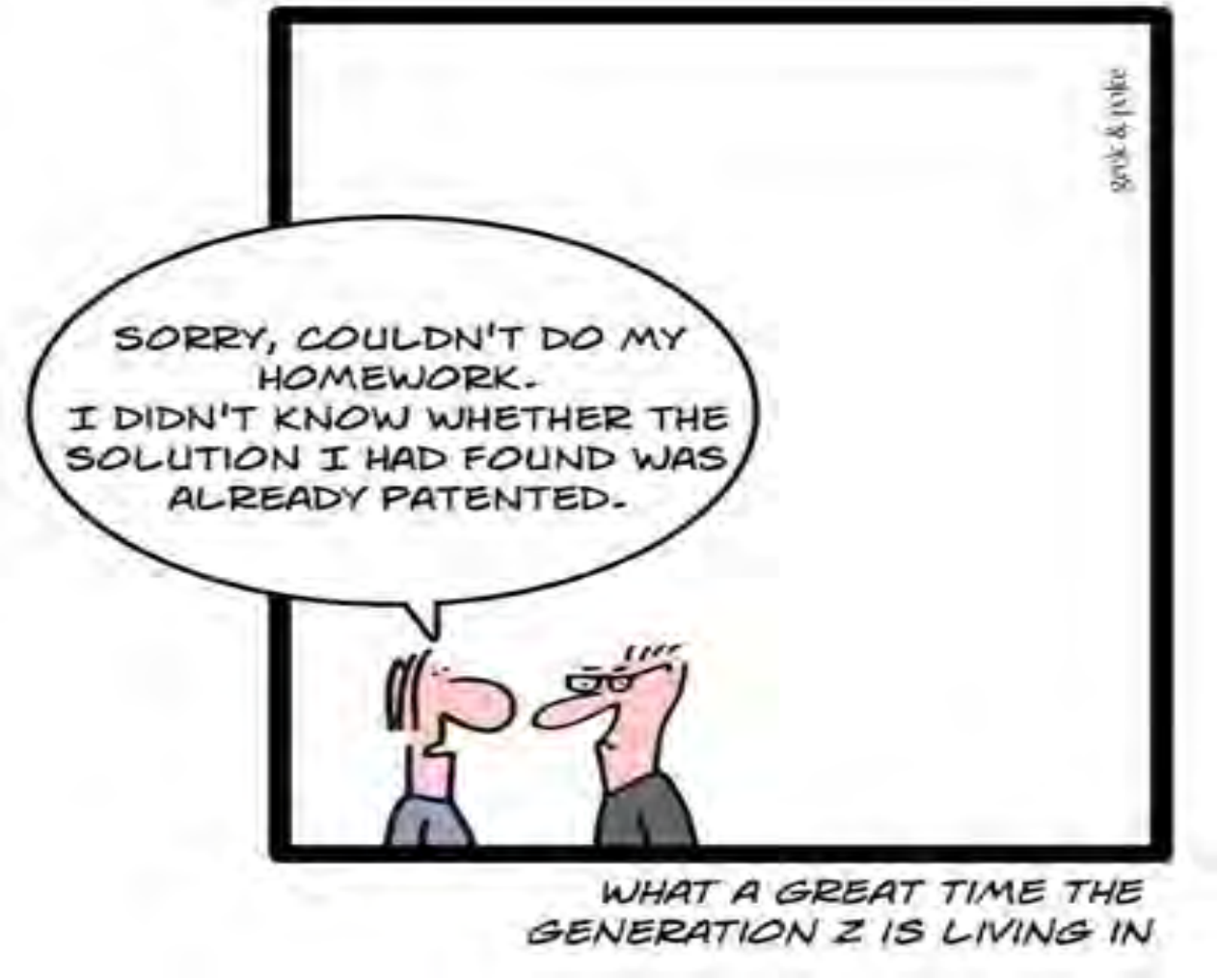
- Agriculture and Plant Biotechnology
- Medicinal and Aromatic plants
- Animal Biotechnology
- Aquaculture and Marine Biotechnology
- Seri biotechnology
- Stem Cell Biology
- Human Genetics and Genome Analysis
- Environmental Biotechnology
- Microbial and Industrial Biotechnology
- Healthcare
- Bio-Fuels
- Bio Pesticides
- Bio-Informatics
- Software Support
- Mechatronics

Patents?

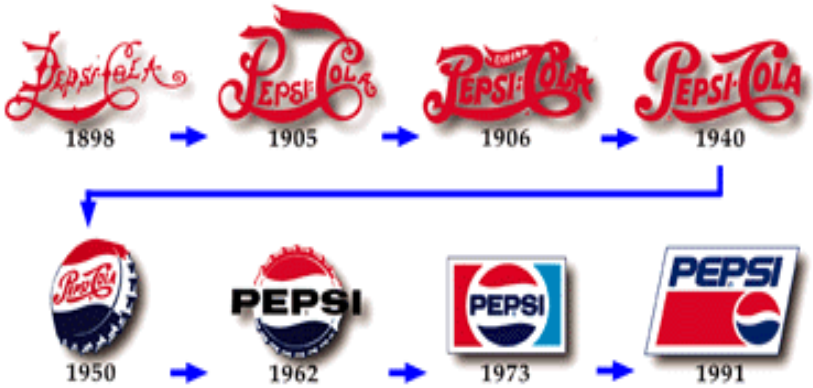
PATENT: ***may be granted for a new, useful, and non-obvious invention***

It gives the patent holder a right to prevent others from practicing the invention *(unless licensed by the inventor),* for a certain period of time *(typically 20 years from the filing date of a patent application).*

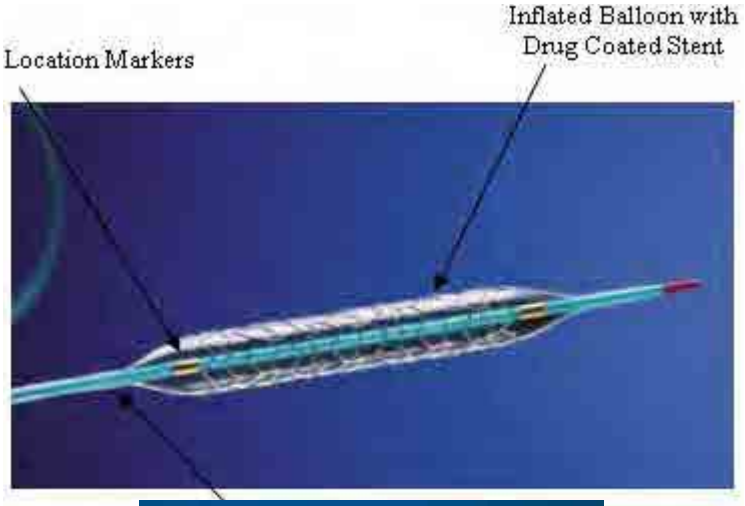
Prior Art as home work?



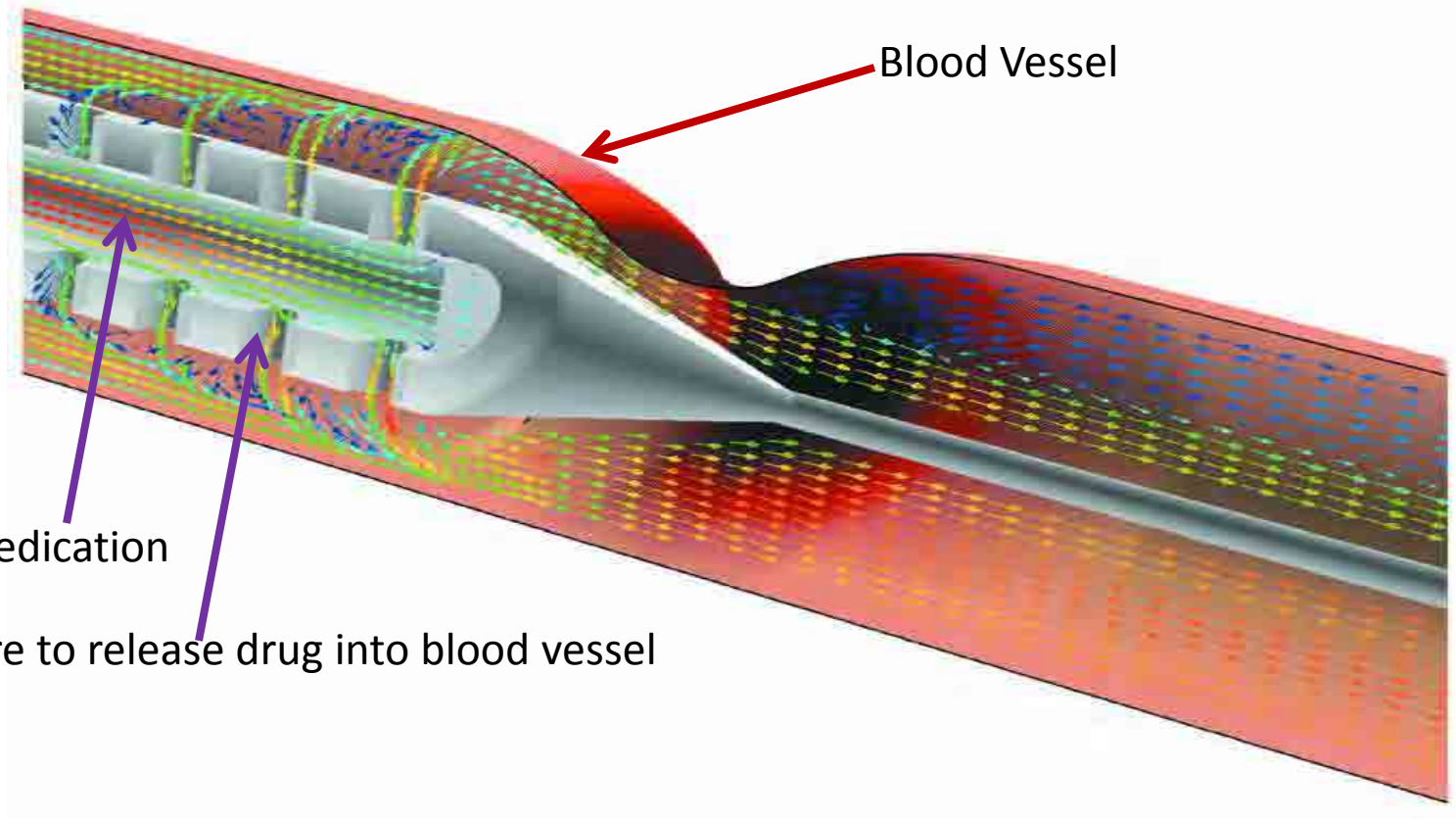
Examples of IP Protection:



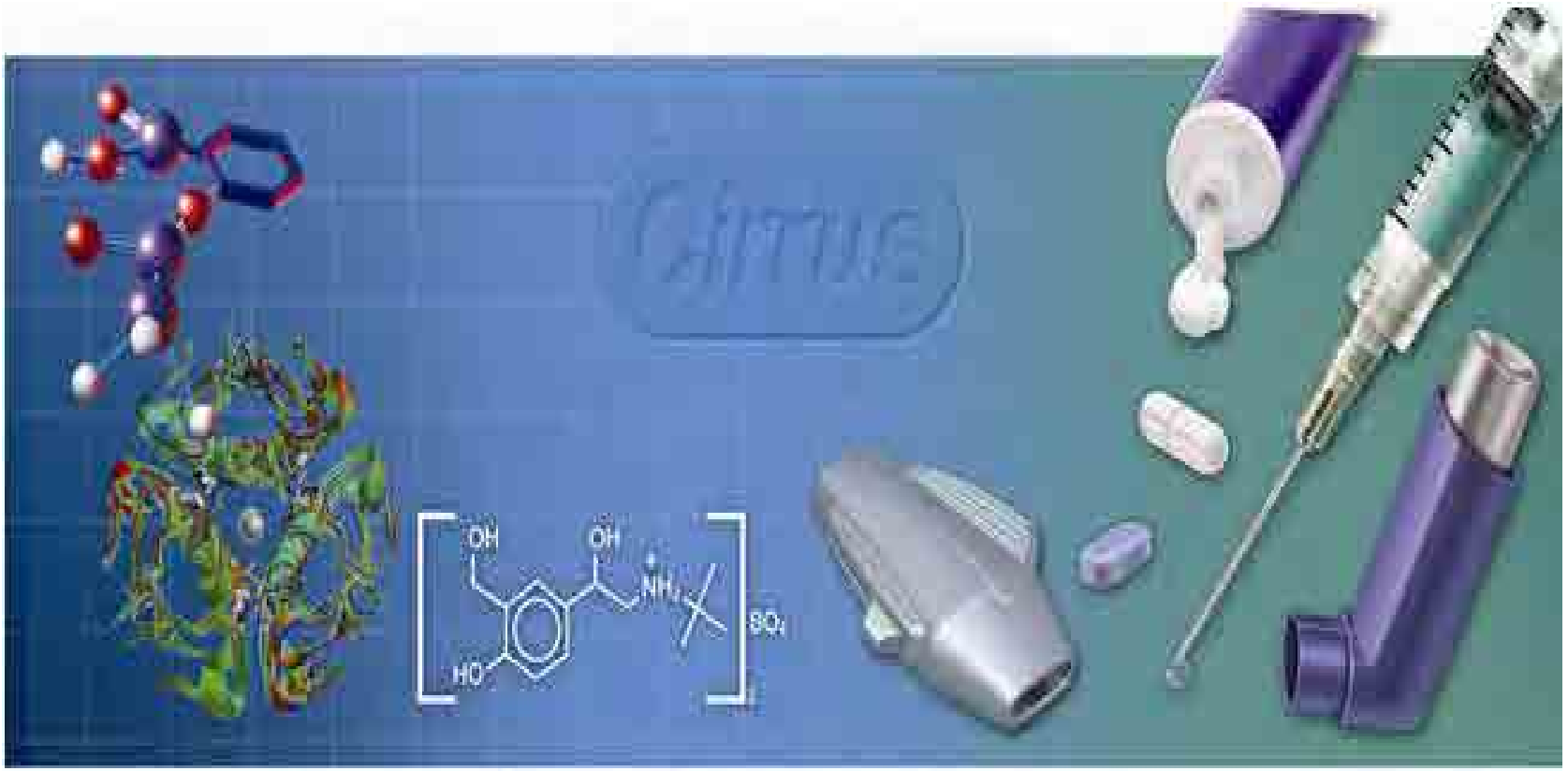
Pace Maker



Drug Eluting Stent



A Vaccine



GloFish®™

Obviousness

Obviousness

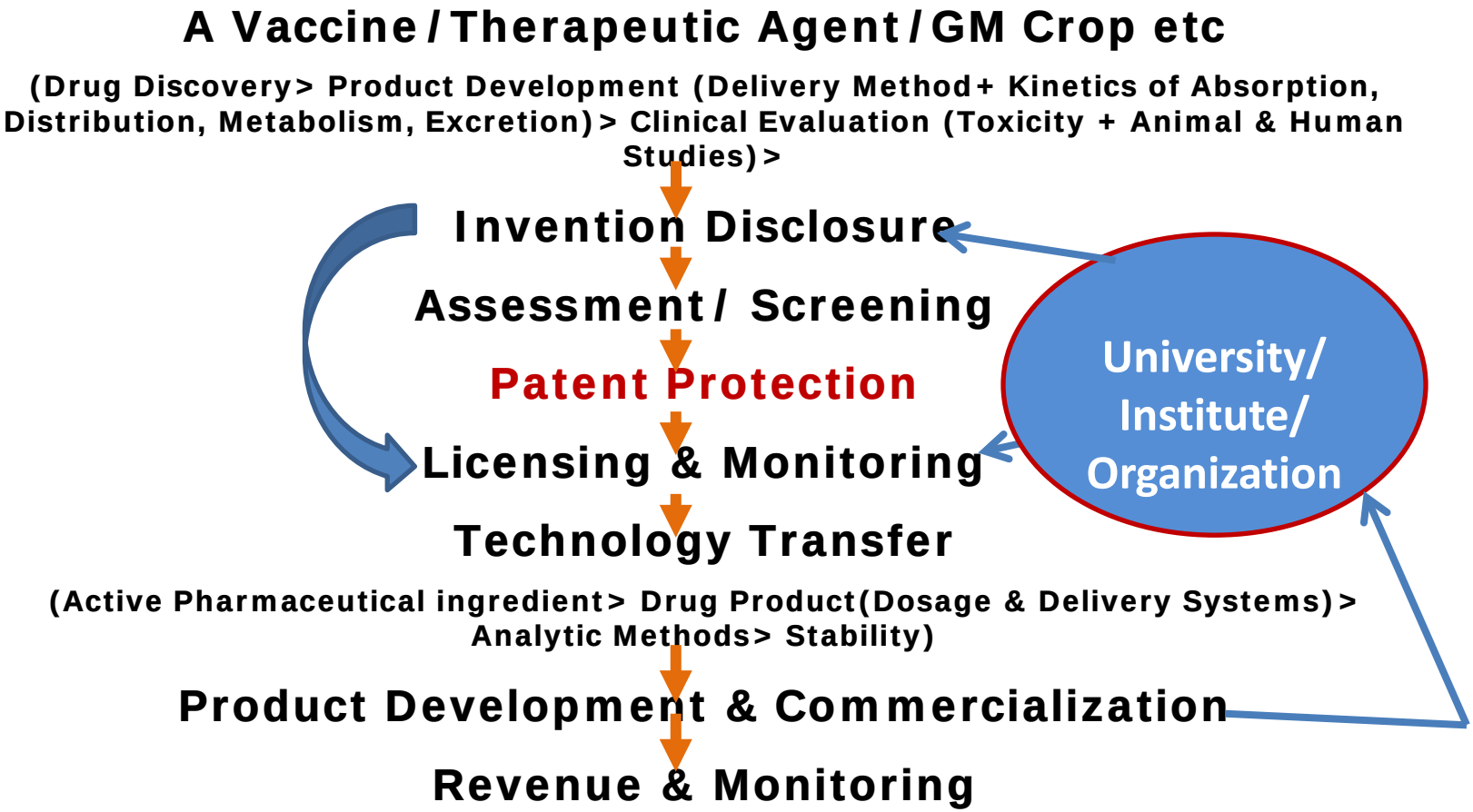
- **Obviousness, means that "a person having ordinary skill in the art" would not know how to solve the problem at which the invention is directed by using exactly the same mechanism.**

- **The obviousness standard prevents the patenting of relatively insignificant differences between the invention and the prior art**

- **The invention must provide one or more new and unexpected results**

Technology Management &Transfer

Technology Transfer Process



(http://www.nii.res.in/faculty-06/RaviDhar.htm)

Approved Drugs Discovered at Academic Institutions

Drug	Indication	Discoverer	Marketer
NCE's			
Abelcet	Systemic fungal infections	M.D. Anderson	The Liposome Company
Adenocard	Cardioprotectant	U. of Virginia	King/Fujisawa
Allegra	Allergies	Georgetown	Aventis
AmBisome	Anti-fungal liposome	U. of California	Fujisawa
Avicine	Cancer	Ohio State	AVI Biopharma/SuperGen
Calcibind	Hypercalciuria	U. of Texas Southwestern	Generic
Carboplatin	Cancer	Michigan State	Bristol-Myers Squib
Cisplatin	Cancer	Michigan State	Bristol-Myers Squib
Decapeptyl	Prostate cancer	Tulane	Ipsen
Elmiron	Bladder pain from interstitial cystitis	U. of California	Ortho McNeill
Emtriva	AIDS	Emory	Gilead Pharmaceuticals
Epicel	Transplantable skin for burn	Harvard	Genzyme Tissue Repair
Epivir	AIDS	Emory	Glaxo
Exosurf	Premature birth respiratory distress	U. of California	Glaxo
Gliadel	Brain cancer	MIT	MGI Pharma/Guilford
Habitrol	Smoking cessation patch	U. of California, LA	Novartis
Integra	Transplantable skin for burn	MIT	J&J
Leustatin	Hairy cell leukemia	Brigham Young/Scripps	J&J
Panretin	Kaposi's sarcoma	Salk Institute/BCM	Ligand
Periostat	Periodontal disease	SUNY	Collagenex
Prozac	Premenstrual dysphoric disorder	MIT	Eli Lilly

Challenging Areas

- **IP Mining**
- **FTOs**
- **Technology Mapping** ***(BIRAC has initiated this-2012)***
- **Infringements**
- **Licensing**
- **Institutional IP policies**
- **How to gel Public and Private effort ??**

Thank you

Questions ?

(rdhar.birac@nic.in)

Technology Licensing in Drugs and Bio-pharma

Kalyan K. Banerji

National Law University, Jodhpur

Technology

- Systematic knowledge (conceptual, empirical, “Scientific”) embodied into tools, to perform human tasks.

- Mixture of physical artifact, social content and context, and procedures.

- Knowledge, ***BY ITSELF***, is not technology

Product and Process Technology

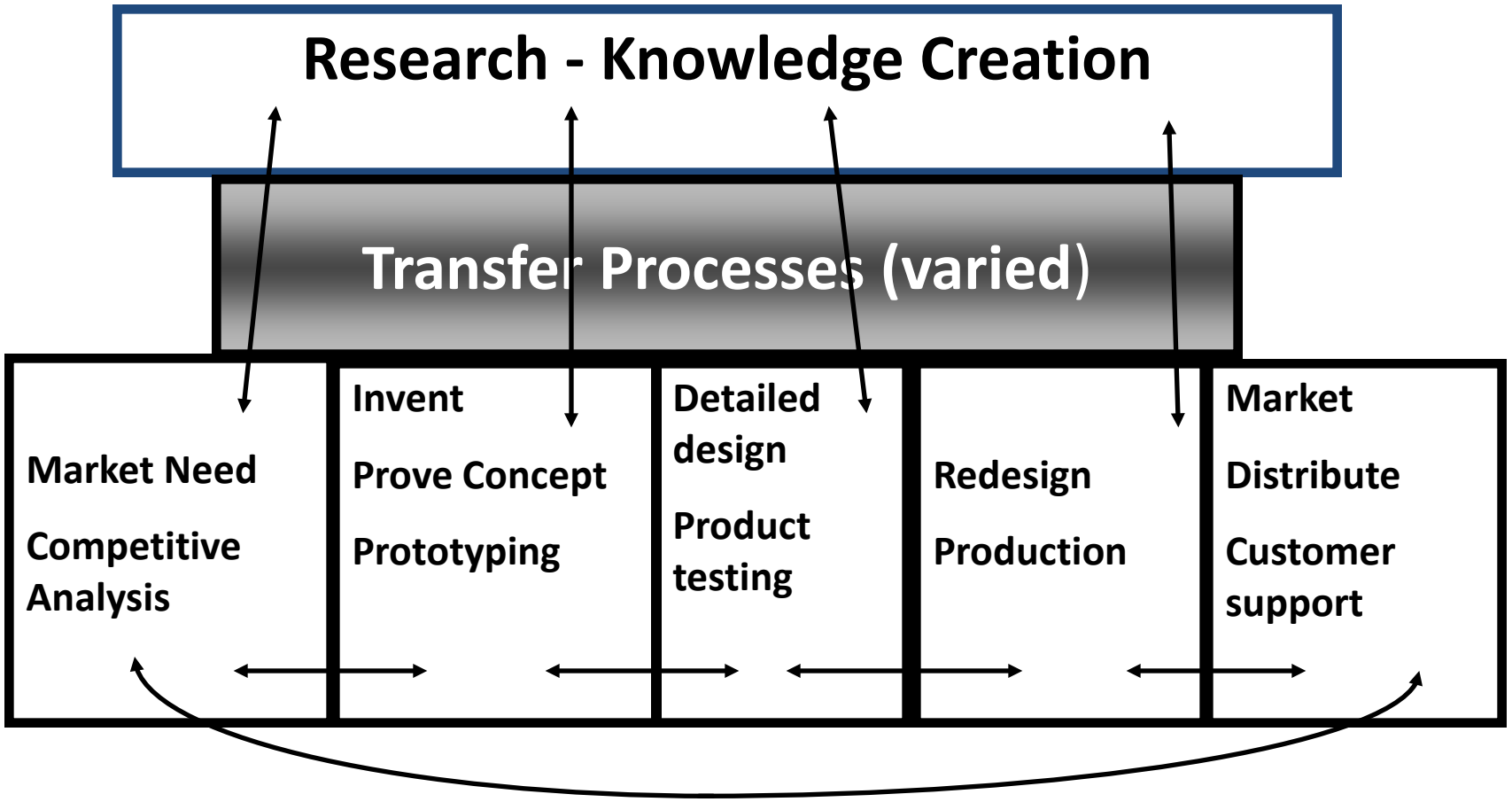
- Product Technology
    - Many end-users (e.g., consumers)
    - Non-obvious relationship to creating/making other technologies
    - Often simpler
- Process Technology
    - Intermediate users
    - Instrumental to creating/making other technologies
    - More complex
- Technologies can be both product or process, and on alternate days, depending upon context (e.g., drill press is a product to drill press maker; part of a process to a tool-and-die shop)

Different paths to commercialization, depending on process/product distinctions.

What is technology transfer?

- Technology transfer is the process by which a developer of technology makes its technology available to a commercial partner that will exploit the technology.
- In the exploitation of pharmaceutical products, technology transfer by partnering in this way to bring a pharmaceutical product to market is a common feature of the industry.

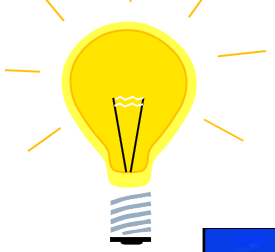
Technology Transfer Cycle



The Product Development Cycle

The Technology Transfer Process

Disclosure

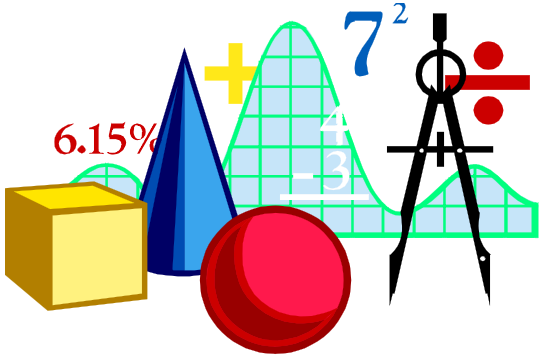


Patenting

Agreement Administration

Licensing

Commercialization



Products/Processes
(Royalties)

WHAT IS A LICENSE?

- License simply means permission – one person grants to another permission to do something
- A license is a permission to do something that, without the license, would be an infringement of IP.
- The person granting the license is usually called the licensor, and the person receiving the license is usually called the licensee

Patent Licensing -Indian Scenario

- A patent owner has the right to use, sale, transfer, license, mortgage and pledge the patent.
- The law on license of patent is well founded in India, though there are not many judicial pronouncements in this regard
- Indian Patent Act has specific provisions

Indian Scenario

- An owner of a patent can grant license. However, a co-owner of a patent cannot grant license without the consent of the other owner(s)
- A License or creation of any other interest in a patent is not valid unless the same is in writing
- The Agreement between the parties should be documented

- The agreement should be prepared on a stamp paper according to the Indian Law on Stamp duties
- The terms and conditions of the agreement should be explicit
- An application for registration of that document should be filed with the Controller of Patents within six months of the date of agreement

- The document registered will be effective from the date of its execution and not from the date of registration
- Both licensee and licensor will have to file application with Controller of Patents
- The terms of license shall be kept confidential by the Controller, if requested by the patentee or licensee

Types of Patent Licenses

- A patent grants its owner the right to exclude others from practicing the patented invention, and it does not give the patent owner the right to practice the patented invention. Licenses should be understood in this context
- Patent licenses can be classified as exclusive, sole and non-exclusive

Exclusive License

- Under an exclusive license, a patent owner transfers all indicia of ownership to the licensee only retaining the title to the patent
- The patent owner surrenders all rights under the patent to the licensee
- The licensor is not entitled to use the IP
- The exclusivity can be limited by a field of use

Non-exclusive license

- By granting a non-exclusive license, the patent owner essentially promises not to sue the licensee for patent infringement
- The patent owner may use and license to more than one licensee.
- **Sole License:**

  - Only the patent owner and licensee can use the invention

Important Clauses

- Recitals
- Definitions
- Grant
- Royalties
- Terms and Conditions

RECITAL

- Parties : Licensor/licensee
- Addresses: If a company, its Registration No.
- Dates : Date of agreement, Date of Commencement
- Background of the transaction

DEFINITIONS

- Interpretation clause
- Consistency o used word
  - Specific/certain/lucid
- Attribute – Specific meaning
- Application to entire agreement
- Example: Licensor shall mean UOR having a business at Jaipur and shall include its subsidiaries, assignees and legal representative

- Licensee shall mean Kalyan resident of A-80 Snagar, Jodhpur and shall include his successors, assignees, administrators, executers and other legal representatives
- Licensed patent shall mean patents granted in USA, under patent No. 123, xyz and patent applications pending before Indian patent office having filling No. 456, def

Grant Clause

- Most Important: Defines scope of agreement
- Status: Parties, type, subjects, rights, territory, term
- Example: Licensor grants a non-exclusive license of the licensed patent within the territory of India from 1st day of January 2013 to 31st day of December 2014

ROYALTIES

- Types of Royalty
  - Lump sum
  - Fixed royalty
  - Running royality
  - Milestone royalty
  - Combination
- Mode and date of payment
- Accounting and record keeping
- Non-payment consequences

Terms and Conditions

- Term
- Events
  - Material breach – non-payment of royalty etc.
  - Bankruptcy
  - Insolvency
  - Act of God
- Rights after termination
- Confidentiality

Pharma Licensing

- Special features for drugs and bio-pharma licensing
- The invention may be an NCE, a cell-line, new biotech process etc.
- For the sake of ease of discussion, let us call the drug or biotech material as *Product* and licensor is the patent owner

Field of Use Restrictions

- Needs special consideration in pharma licensing.
- The *Product* may have preventive, diagnostic and therapeutic uses for several diseases
- In the absence of field of use restrictions, the licensee would have rights to exploit the *Product* in all of those fields
- The licensee may not be interested in all the fields

- Therefore, it is in the interest of the licensor to give the licensee a field of use that permits the licensee to effectively exploit the *Product* in its desired field of use, but not to deprive the licensor of the opportunity to exploit the other potential uses.
- The field of use should be as clear and unambiguous as possible

Non-exclusive license

- In case of a non-exclusive license, the licensor reserves the right to grant more non-exclusive license
- Unless limited by territory and/or use, it may result full scale competition.
- Because of large investment required in pharma field, non-exclusive licenses are mostly confined to peripheral inventions

- New drug delivery systems(NDDS) or discovery methods are such inventions
- Non-exclusive license of an NDDS can be combined with a proprietary drug of the licensee

PAYMENT TERMS

- Some or all of the following are common in biotech or pharmaceutical license agreements
  - a license or signing fee
  - annual or other periodic fees
  - milestone payments
  - percentage royalties, which may include minimum annual amounts
  - expenses of the patent prosecution program

Signing Fee/Annual Fees

- It depends on stage of development of the invention; inventor may try recoup some of the investment in the invention
- Annual or periodic fees are to incentivize the licensee to exploit the invention
- Mostly terminate when the percentage royalties kick in

MILESTONE PAYMENT

- Very common in pharmaceutical industry
- Triggered by the typical development benchmarks for a pharmaceutical product, the achievement of which validate the value of the *Product*
- The typical milestones are:
  - Filing of INDA or equivalent
  - Completion of Phase I clinical trials

  - Completion of Phase II clinical trials
  - Completion of Phase III clinical trials
  - Filing of NDA or equivalent
  - Approval of NDA or equivalent
- Milestone payments on Clinical trials should be clear about whether on “completion” or successful “completion”
- It could be at the start of the next phase

DRUG MASTER FILE

- Drug master file is the collection of information and data that results from the development process for a potential pharmaceutical product, such as toxicology studies and clinical trial results
- The drug development process is highly regulated and structured in the sense that certain types of tests and procedures must be conducted for all potential products

Drug Master File

- The cost of drug development is prohibitive (current estimates are for $800 million to $ 1 b), and therefore the drug master file has an inherent value represented by that cost
- An important issue is the disposition of the drug master file in the event of early termination of the license agreement

TYPES

OF

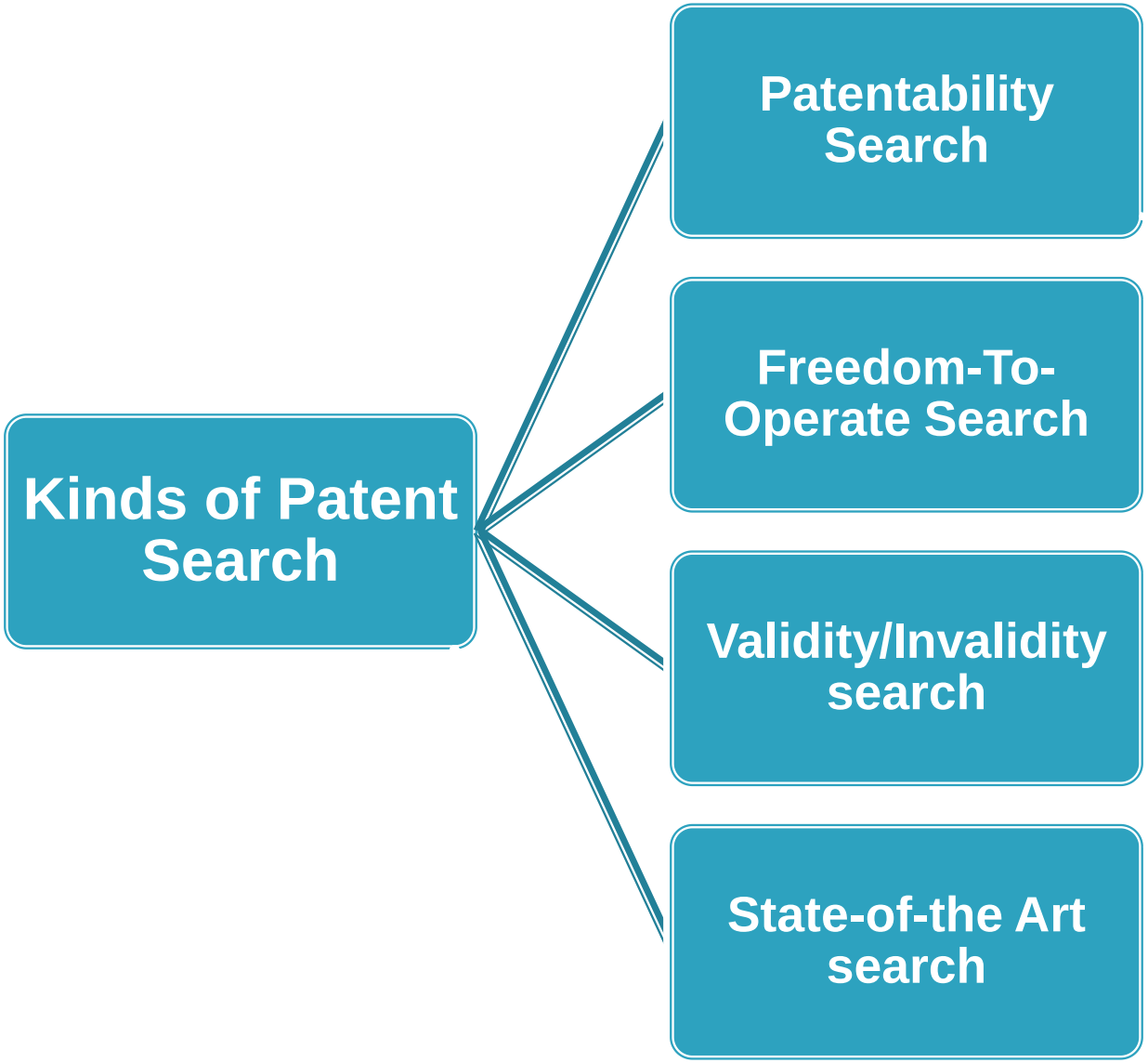
PATENT SEARCHES

Dr. Vinita Jindal, Ph.D.

Biotechnology Industry Research Assistance Council (BIRAC)
New Delhi-110 024
(A Government of India Enterprise)

(vjindal.birac@nic.in)

1. Kinds of patent search
2. Key Concepts in searching
    - What do we search
    - The process of patent search
3. Creating & Refining Search Queries
4. Databases to retrieve the Technology Information
    - Patent database
    - Non-Patent Databases
6. How to use patent databases


Kinds of Patent Search
Patentability Search
Freedom-To-Operate Search
Validity/Invalidity search
State-of-the Art search

Why we Search?

To retrieve information which is required to answer specific questions

Patentability Search

- Is a given invention (claimed in a patent application) patentable?

Freedom-To-Operate Search

- Do patent rights exist on which a given product risks infringing?

Validity/Invalidity Search

- Is a given patent valid?

State-of-the Art Search

- Which technologies exist in a given field of technology?
- Who is active in a given field of technology?

Patentability Search

Also known as *Novelty Search*

Done to identify patents and non-patent literature

Recommended to be done before writing and filing the patent specification, and therefore,

Sometimes called a pre-application search

Novelty

An invention shall not be considered new if it forms part of a prior art.

Prior Art

Everything which has been made available to the public anywhere in the world, before the filing date or the priority date of the application claiming the invention

Freedom-To-Operate Search (FTO)

A clearance search which concentrates on uncovering enforceable patents that may act as "roadblocks" to commercialization of a product or service

Guide product design decisions.

Identify patents that may need to be licensed

State-of-the-Art Search

Search is executed in order to determine existing solutions and potential competitors within a given technological field

The search includes not only patent documents but also non patent literature

Plan R&D activities more efficiently

Decide whether to enter a market

Determine which areas are not sufficiently covered by existing players

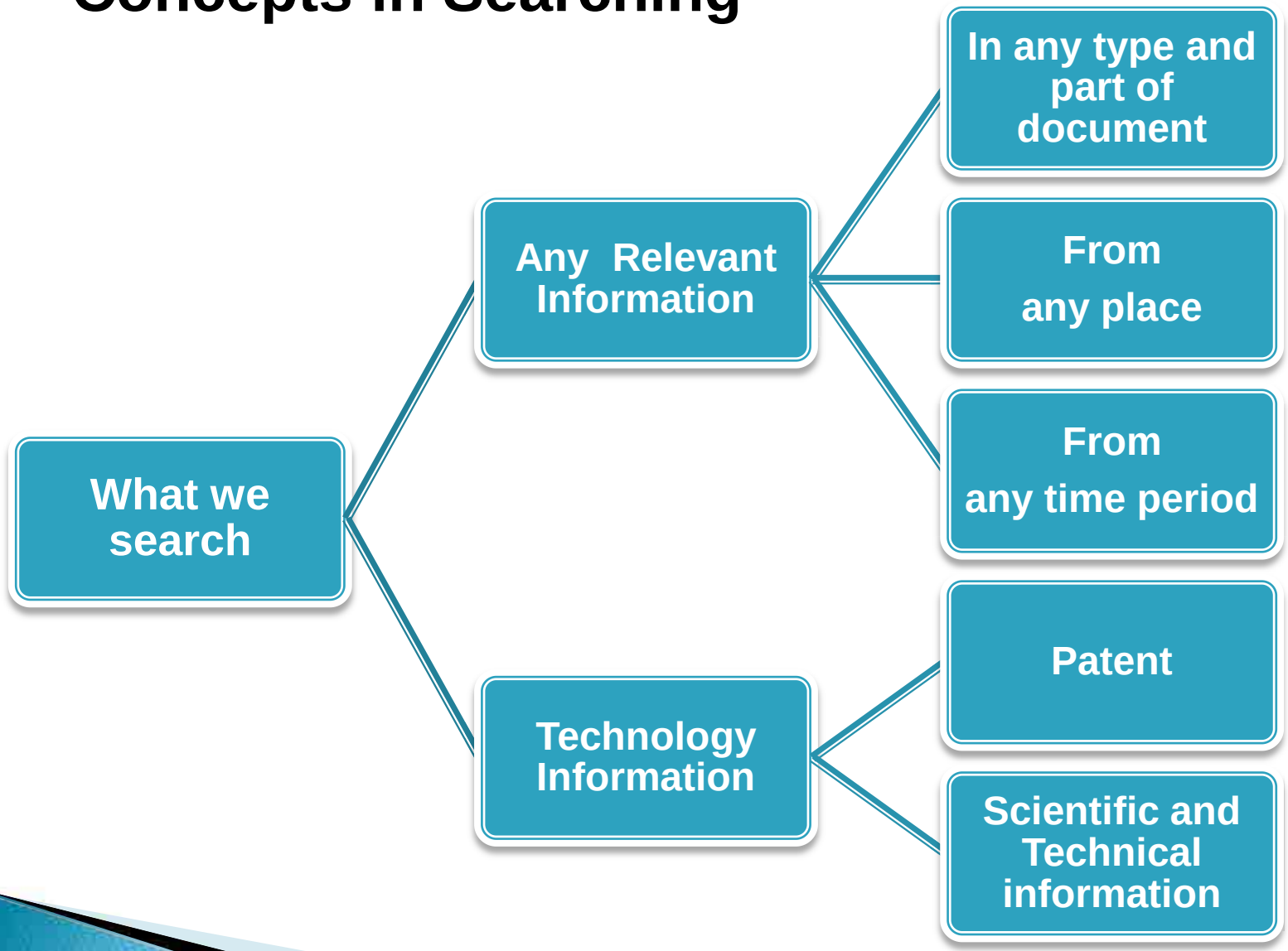
Validity/Invalidity Search

The purpose of a validity (or invalidity) search is to find prior art so that a patent can be declared invalid

Prior art search done after a patent issues

Done by an entity infringing or potentially infringing the patent, or it might be done by a patent owner

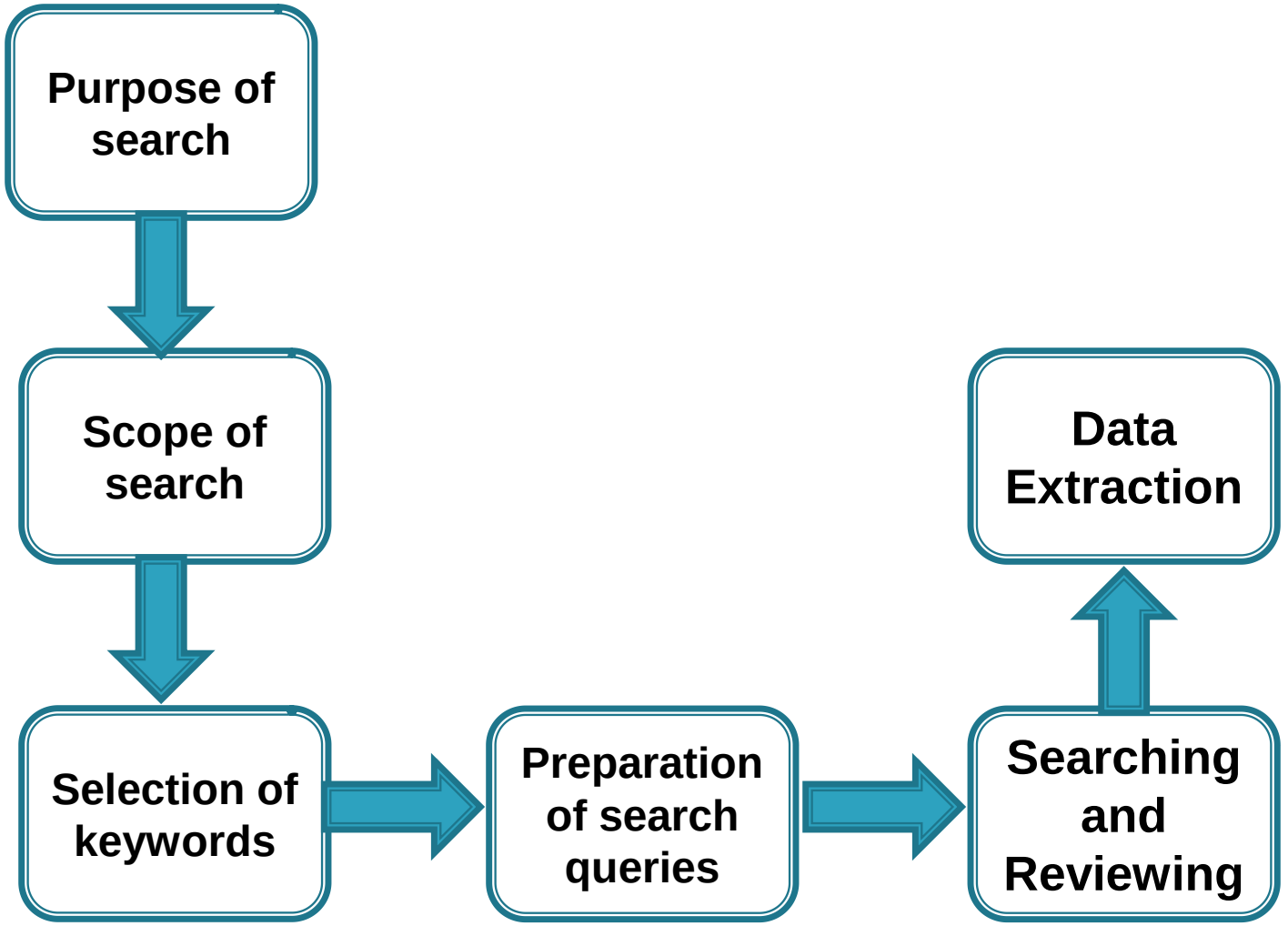
Concepts in Searching



Scientific and technical information

- **Scholarly publications:**
  - Handbooks, textbooks, encyclopaedias, journals, dissertations, conference proceedings, technical reports
- Industry/trade publications:
  - Industry reviews, disclosure publications
- Newspapers
- Websites
  - Technology blogs, researchers' websites

Process of Patent Search



Creating and Refining Search Queries

1. Truncation or Wildcard operators

These type of operators stand for an unspecified number of characters in a queries

Wildcard	Meaning	Use in Patent collections	Example
? (Question Mark)	Represent to exactly one character	Left, right, and internal use supported	“t?re” will pick up “tyre” and “tire”)
* (Asterisk)	Represent to unlimited number of characters	Left and/or right, internal	“File*” will pick up file or files etc.

2. Proximity operators

Proximity operators search:

- Based on the distance by number of terms separating two keywords, and
- Also find words in the same paragraph

Operators	Meaning	Example
SAME	Terms must be in the same paragraph, in any order	Flame SAME Resistant
ADJ	Terms should be next to each other and in the same order	Flame ADJ Resistant
NEAR	Terms should be next to each other and in any order	Flame NEAR Resistant

Bibliography

DWPI Title ?

Flame retardant thermoplastic poly:pivalolactone compsn. contains ammonium poly:phosphate for heat resistant, impact resistant mouldings

Original Title ?

Flame retardant polypivalolactone compositions

Assignee/Applicant ?

Standardized: **ETHYL CORP**

Original: Ethyl Corporation, Richmond, VA, US

DWPI Assignee/Applicant ?

ETHYL CORP (ETHY-C)

Inventor ?

Zorzi Paul A., Baton Rouge, LA, US Allen Thomas S., Baton Rouge, LA, US Kucsma Michael E., Baton Rouge, LA, US

DWPI Inventor ?

ALLEN T S; KUCSMA M E; ZORZI P A

Publication Date (Kind Code) ?

1979-03-20 (A)

DWPI Accession / Update ?

1979-27723B / 197914

Application Number / Date ?

THOMSON INNOVATION

Patent Result Set

日本語で表示 | 简体中文显示

Quick Search: Patents printer Go ?

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  - Patent Search
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System Notices: None

THOMSON REUTERS

Patent Result Set

12,894 records found out of 85,579,977 searched (Display Limit 30,000)

Return to Search | Advanced Subsearch | Highlight | Display & Sort Options | Retrieve DWPI Family

8403 INPADOC Families | 0 records selected

Show Refine & Subsearch

Save ▼ | Alert ▼ | Mark List ▼ | Download ▼ | Charts | Print ▼

Publication Number	Inventor	Assignee/Applicant	Publication Date
CA1056549A1	ZUPANCIC HEINZ-ULRICH	TEXACO AG	1979-06-12
Title: PROCESS FOR THE PRODUCTION OF FLAME-RESISTANT PHENOLIC RESIN FOAM PLASTICS			
CA2373581C	ZUCCARINI ANTHONY MARK	ZUCCARINI ANTHONY MARK	2004-07-27
Title: METHOD AND APPARATUS FOR BAKING FOODS IN A BARBEQUE GRILL			
RU2024560C1	ZUBKOVA NINA S	MO G TEKSTILNAYA AKADEMIYA IM	1994-12-15
Title: FLAME RESISTANT POLYMERIC COMPOSITION			
CN101115348A	ZOU Ming-ren	NANYA PLASTICS CORP	2008-01-30
Title: Polybutadiene thermosetting resin printed circuit carrier plate composition and method for making the same			
US4145330A	Zorzi Paul A.	ETHYL CORP	1979-03-20
Title: Flame retardant polypivalolactone compositions			
US4113669A	Zondler Helmut	CIBA GEIGY CORP	1978-09-12

Displaying 1 - 500 of 8403

1 2 3 4 5 Page 1 of 17

Go to Page:

Record View: Patent CA1056549A1

Application Number / Date ?

CA221595A / 1975-03-07

Priority Number / Date / Country ?

DE2413567A / 1974-03-21 / DE

Abstract

DWPI Abstract ?

(DE2413567A1)

Novelty

Flame-resistant foamed phenolic resins are prepd. by (a) mixing a phenol-formaldehyde resin condensed under alkaline conditions with (I) a blowing agent, e.g. pentane or methylene chloride, and (II) a curing agent consisting of a mixt. of 8-12 vol. esp. 10% aromatic sulphonic acid, 18-22 esp. 20 vol.% ethylene glycol and 68-72 esp. 70 vol.% 85% phosphoric acid, and (b) foaming/curing under hot or cold conditions. In addn. to a good resistance to free flames, also posses a good mechanical strength. The sulphonic acid is pref. 60% phenolsulphonic acid. The phenolic resin soln. contains 75% solids, and 15-40 esp. 25-30 vol.% (II), based on soln.

Abstract ?

ABSTRACT OF THE DISCLOSURE Flame-resistant foam plastics are prepared bymixing with an aqueous alkaline condensed phenol-formaldehyde resin solution an expanding agent such as hexane andan acidic curing agent after which the mixture is foamed and permitted to cure. Useful acidic curing agents, comprise mixtures of a strong inorganic or organic acid, a glycol and phosphoric acid.

Classes/Indexing

IPC ?

IPC Code(1-7) **C08K 5/42** C08J 9/14 C08L 61/10

(7)

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www.thomsoninnovation.com/tip-innovation/resultSetPatent.do

THOMSON INNOVATION

Patent Result Set

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Search

Patent Search

• Result Set

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Preferences

Support

System Notices: None

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Patent Result Set

15,832 records found out of 65,679,677 searched [Disp

Return to Search | Advanced Subsearch | Highlight | Display & Sort Options | Retrieve DWPI Family

10348 INPADOC Families | 0 records selected

Save ▼ | Alert ▼ | Mark List ▼ | Download ▼ | Charts | Print ▼

DE3271894D1	ZOLLNER ROBERT DR	BAYER AG
Title: PROCESS FOR THE PREPARATION OF FLAME-RESISTANT AND COLD-RESISTANT POLYURETHANE FOAMS AN		
EP588003B1	Zobrist Konrad (Colasit AG)	WAGNER INT
Title: Spraying booth		
JP0438365B2	-	BAYER AG
Title: A flame-resistant polycarbonate / ABS plastic molding material		
TWI304428B	MICHAE_ ZOBEL	BAYER AG
Title: Flame-resistant polycarbonate compositions having increased chemical resistance		
EP1214380B1	ZOBEL Michael	BAYER MATERIALSCIENCE AG
Title: FLAME-RESISTANT POLYCARBONATE BLENDS		
EP1095100B1	ECKEL Thomas	BAYER AG
Title: FLAME RESISTANT POLYCARBONATE/ABS PLASTIC MOLDING MATERIALS		

Displaying 1 - 500 of 10348

1 2 3 4 5 Page 1 of 21

3. Boolean Operators

Major Boolean operators are AND, NOT, and OR which can be used in all collections

Operators	Meaning	Example
AND (to narrow down a search by combining search terms)	Two term must exist	Nylon AND rayon
OR (to increase the chances of finding results)	Any one term or two terms must exist	Nylon OR rayon
NOT (to exclude irrelevant patents from a search)	A term following “NOT” must be excluded	Nylon NOT rayon

Databases to retrieve the Technology information

Free Patent databases

- US Patent and TradeMark Office (USPTO)
URL: www.uspto.gov

- Espacenet
URL: www.ep.espacenet.com

- WIPO (World Intellectual Property Organization)
URL: http://patentscope.wipo.int/search/en/search.jsf

- Patent Lens
URL: http://www.patentlens.net/patentlens/quick.html

- Freepatents online
URL: www.freepatentsonline.com

USPTO Patent Full-Text and Image Database

Data current through November 13, 2012.

Query [Help]

Term 1: in Field 1: All Fields

AND

Term 2: in Field 2: All Fields

Select years [Help]

1976 to present [full-text]

Search Reset

Patents from 1790 through 1975 are searchable only by Issue Date, Patent Number, and Current US Classification.

When searching for specific numbers in the Patent Number field, patent numbers must be seven characters in length, excluding commas, which are optional.

USPTO PATENT FULL-TEXT AND IMAGE DATABASE

Data current through November 13, 2012.

Query [Help]

Term 1: in Field 1: All Fields

AND

Term 2: in Field 2:

Select years [Help]

1976 to present [full-text]

All Fields
Title
Abstract
Issue Date
Patent Number
Application Date
Application Serial Number
Application Type
Assignee Name
Assignee City
Assignee State
Assignee Country
International Classification
Current US Classification
Primary Examiner
Assistant Examiner
Inventor Name
Inventor City
Inventor State
Inventor Country

P 75 are searchable only by Issue Date, Patent Number, and Current US Classification.

When searching for sp Number field, patent numbers must be seven characters in length, excluding commas, which are optional.

USPTO Patent Full-Text and Image Database

Data current through November 13, 2012.

Query [Help]

Examples:
ttl/(tennis and (racquet or racket))
isd/1/8/2002 and motorcycle
in/newmar-julie

Select Years [Help]

1976 to present [full-text]

Search Reset

Patents from 1790 through 1975 are searchable only by Issue Date, Patent Number, and Current US Classification.
When searching for specific numbers in the Patent Number field, patent numbers must be seven characters in length, excluding commas, which are optional.

Field Code	Field Name	Field Code	Field Name
PN	Patent Number	IN	Inventor Name
ISD	Issue Date	IC	Inventor City
TTL	Title	IS	Inventor State
ABST	Abstract	ICN	Inventor Country
ACLM	Claim(s)	LREP	Attorney or Agent
SPEC	Description/Specification	AN	Assignee Name
CCL	Current US Classification	AC	Assignee City
ICL	International Classification	AS	Assignee State
APN	Application Serial Number	ACN	Assignee Country

USPTO Patent Full-Text and Image Database

Data current through November 13, 2012.

he patent numbers you are searching for in the box below.

[Help]

Search Reset

ent numbers must be seven characters in length, excluding commas, which are optional. Examples:

Utility -- 5,146,634 6923014 0000001
Design -- D339,456 D321987 D000152
Plant -- PP08,901 PP07514 PP00003
Reissue -- RE35,312 RE12345 RE00007
Defensive Publication – T109,201 T855019 T100001
Statutory Invention Registration – H001.523 H001234 H000001
Re-examination – RX12
Additional Improvement -- AI00,002 AI000318 AI00007

Eurasian Patent Office

espacenet 1998-2008

Quick Search
Advanced Search
Number Search
Last result list
My patents list 0
Classification Search
Help

Quick Help
» What are publication, application, priority and NPL reference numbers?
» How do I enter publication, application, priority and accession numbers?
» Can I search for more than one number at a time?

Number Search

1. Database

Select the patent database in which you wish to search:

Database: EA - esp@cenet

2. Enter Number

Enter either accession, application, publication or priority number with country code prefix

Number: e.g. EP1322146

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Number Search

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Select the patent database in which you wish to search:

Database: EA - esp@cenet

- EA - esp@cenet
- Worldwide
- WIPO - esp@cenet
- EP - esp@cenet

2. Enter Number

Enter either accession, application, publication or priority number with country code prefix

Number: e.g. EP1322146

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Advanced Search

Number Search

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Classification Search

Help

Quick Help

» How many terms can I enter per field?

» Can I search with a combination of words?

» Can I use truncation or wildcards?

» How do I enter publication, application, priority and accession numbers?

» What is the difference between the IPC and the ECLA?

» Can I enter a date range?

Advanced Search

1. Database

Select the patent database in which you wish to search:

Database: EA - esp@cenet

2. Search terms

Enter keywords in English

Keyword(s) in title (in English):		e.g. motor
Keyword(s) in title or abstract (in English):		
Publication number:		e.g. EP1322146
Application number:		e.g. EP20030005329
Priority number:		e.g. DE20001063084
Publication date:		e.g. 20030917
Applicant(s):		e.g. IBM
Inventor(s):		e.g. Siemens
European Classification (ECLA):		
International Patent Classification (IPC):		e.g. H02M7/537 H03K17/687

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Home > IP Services > PATENTSCOPE
Simple Search
Using PATENTSCOPE you can search 14,104,590 patent documents including 2,144,758 published international patent applications (PCT).
Detailed coverage information can be found here (->)
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Jordan
Kenya
Mexico
Morocco
Nicaragua
Panama
Peru
Republic of Korea
Russian Federation
Russian Federation (USSR data)
Singapore
South Africa
Spain
Uruguay
Viet Nam
ARIPO
EPO
LATIPAT
All
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Examples:
The entered value is searched against the Title, Abstract, Numbers and Names.
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Smith or Klein
WO2010000001
EP2012001709
"sol* panel"~5
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electric^10 and car^3

Patent Lens

Free Full-text Worldwide Patent Searching - 12,242,942 patent documents - updated Oct 23, 2012

Patent Number | Quick Search | Structured Search | Expert Search | Search for Sequences in Patents

Match all (AND) criteria (if multiple fields are used)

in full-text

in title [-]

in abstract [-]

in inventor [-]

in applicant/assignee [-]

[+]

Publication or Filing Date

Predicted Expiry Date (US granted patents only)

Lapsed Date (US granted patents only)

Stemming On Items per page 10

Patent Collections

Grants	Applications
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Europe	WIPO/PCT
Australia	Australia

Language English

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Nov 15, 2012 by Erik Reeves
Innovation Wars - a patent system "working as intended" or "run amok"?

Oct 21, 2012 by James Ryley, PhD
Tools Examiners Apparently Don't Have - But Should

Oct 20, 2012 by James Ryley, PhD
Is Software Patentable? Wanna Bet?

Oct 11, 2012 by Erik Reeves
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Most Popular Patent Topic

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IP RESEARCH & COMMUNITIES

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Click here for syntax instructions, field abbreviations and character map

- [x] US Patents
- [ ] US Patent Applications
- [ ] EP documents
- [ ] Abstracts of Japan
- [ ] WIPO (PCT)
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- [ ] Non-patent Literature

Date Range*	All years	Last 20 years
Word Stemming	On	Off
Sort Order	Chronological	Relevancy

*Entering date parameters in the box will override the 'date range' buttons.

Search Reset

Coverage Details: Coverage details for the patent database can be found here.

Note that most fields support Phrase (ABST/"cardboard box"), Proximity (ABST/"cardboard box"~5), Wildcard (ABST/card*), and Leading Wildcard (ABST/*ectomy) queries. Some fields support range queries and math operations. Only basic examples are provided below. See the syntax guide for advanced syntax details.

Field Abbr.	Field Name	Type	Syntax Example and Comments
AADR	Assignee Address (complete string)	Text	AADR/California AADR/"Route 66"
ABST	Abstract	Text	ABST/widget ABST/"titanium steel"
AC	Assignee City	Text	AC/Paris AC/"New York"

Classification

Current US Classification (e.g. 100/50) ?

International Classification (e.g. G06F019/00) ?

Inventor Fields

Inventor (e.g. Jones Mark) ?

Inventor Country (e.g. JP) country codes ?

Inventor State (e.g. NY) US state codes ?

Inventor City (e.g. New York) ?

Assignee Fields

Assignee (e.g. Sanyo) ?

Assignee Country (e.g. JP) country codes ?

Assignee State (e.g. NY) US state codes ?

Assignee City (e.g. New York) ?

References

Domestic References (e.g. 5796187) ?

Foreign References (e.g. JP02292118) ?

Other References (e.g. patent law) ?

Legal/Prosecution Information

Parent Case Information (e.g. 10/007,521) ?

Primary Examiner (e.g. Jones David) ?

Assistant Examiner (e.g. Mathew Fenn) ?

❖ For Chemical structure searches

- PubChem
- ChemSpider

❖ For Sequence search

- Patent Lens
- PubMed

Firefox | Nucleotide BLAST: Search nucleotide da... | +

blast.ncbi.nlm.nih.gov/Blast.cgi?PROGRAM=blastn&BLAST_PROGRAMS=megaBlast&PAGE_TYPE=BlastSearch&SHOW_DEFAULTS=on&LINK_LOC=blasthome

pubmed sequence search

BLAST® Basic Local Alignment Search Tool

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NCBI/ BLAST/ **blastn suite**

Standard Nucleotide BLAST

blastn | blastp | blastx | tblastn | tblastx

BLASTN programs search nucleotide databases using a nucleotide query. more...

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Clear

Query subrange

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To

Or, upload file

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Enter a descriptive title for your BLAST search

Align two or more sequences

Choose Search Set

Database: Human genomic + transcript | Mouse genomic + transcript | Others (nr etc.)

Human genomic plus transcript (Human G+T)

Organism
Optional

Exclude

Enter organism common name, binomial, or tax id. Only 20 top taxa will be shown.

Exclude
Optional

Models (XM/XP) | Uncultured/environmental sample sequences

Entrez Query
Optional

Enter an Entrez query to limit search

Program Selection

Optimize for ... sequences (megablast)

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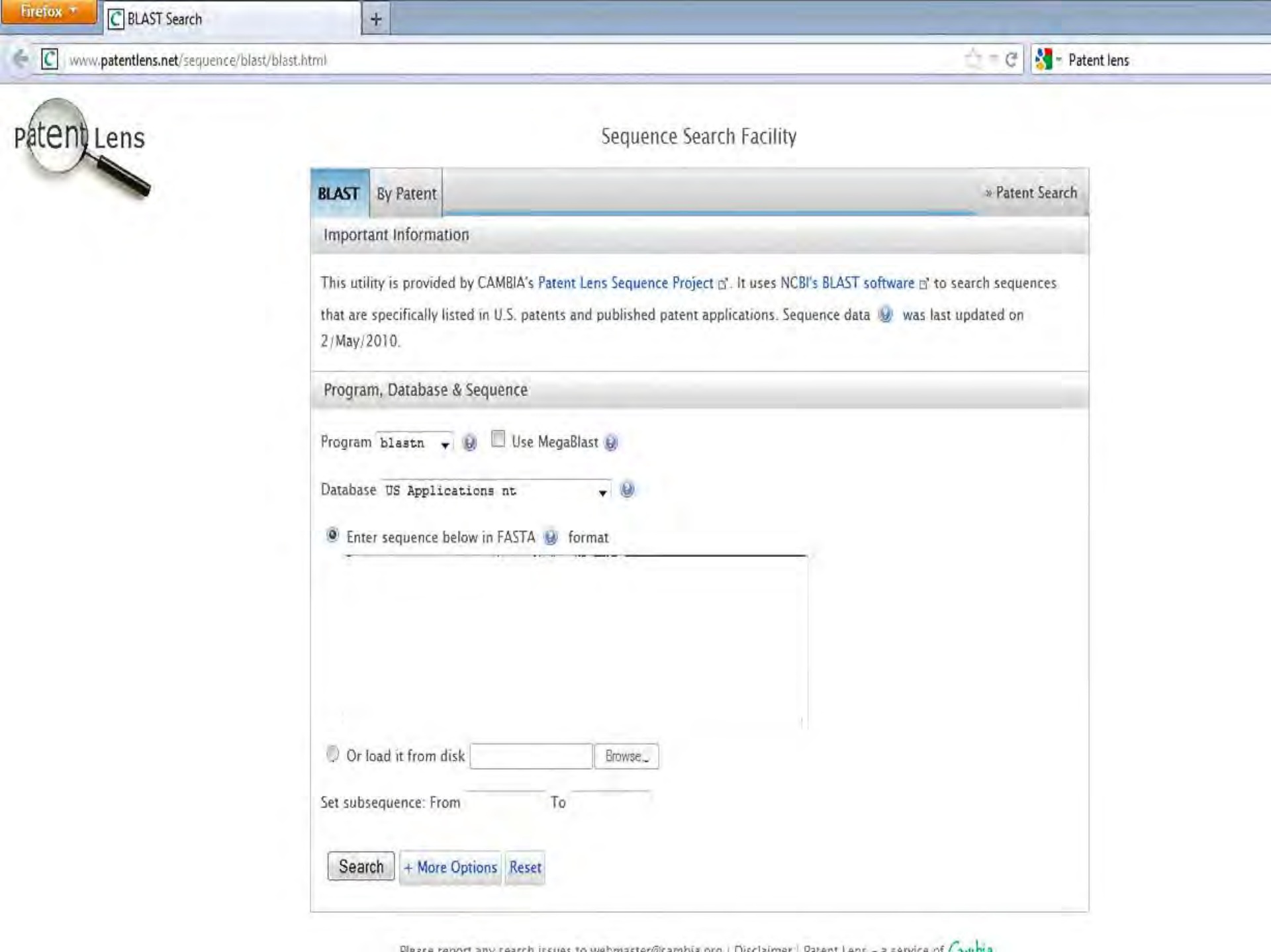
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Patent lens
Patent Lens
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Program blastn
Use MegaBlast
Database US Applications nt
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Or load it from disk
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NCBI

PubChem Structure Search

PubChem Compound

Limits Advanced search

Search By: Name/ Text | Identity/ Similarity | Substructure/ Superstructure | Molecular Formula | 3D Co

Synonyms/Descriptors/MeSH term etc:

Search

Clear

You are here: NCBI > Chemicals & Bioassays > PubChem > Structure Search

GETTING STARTED
- NCBI Education
- NCBI Help Manual
- NCBI Handbook
- Training & Tutorials

RESOURCES
- Chemicals & Bioassays
- Data & Software
- DNA & RNA
- Domains & Structures
- Genes & Expression
- Genetics & Medicine
- Genomes & Maps
- Homology
- Literature
- Proteins

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- Nucleotide
- BLAST
- PubMed Central
- Gene
- Bookshelf
- Protein
- PubChem
- OMIM
- Genome

FEATURED
- GenBank
- Reference Sequences
- Map Viewer
- Genome Projects
- Human Genome
- Mouse Genome
- Influenza Virus
- Primer-BLAST
- Sequence Read Archive

RSC SyntheticPages

ChemSpider
The free chemical database

RSC | Adva Chem

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Search

Simple | **Structure** | Advanced | More searches...

1. Input your structure (choose a, b or c)

a. Upload a structure file (MOL, SDF, CDX) or image file (PNG, JPG, GIF)

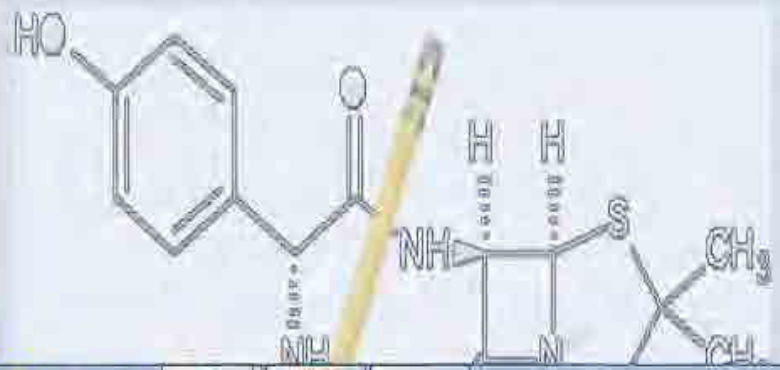
Browse...

b. Convert to structure using a Name, SMILES, InChI or ChemSpider ID

Convert

c. Click the image to draw out the structure yourself

2. Edit molecule



- Exact
- Substructure
- Similarity

Search Options

- Exact Match
- All Tautomers

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  URL: https://www.thomsoninnovation.com/login

- Questel Orbit

  URL: www.orbit.com

- STN

  URL: http://www.stn-international.de/index.php?id=123

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Patent Search

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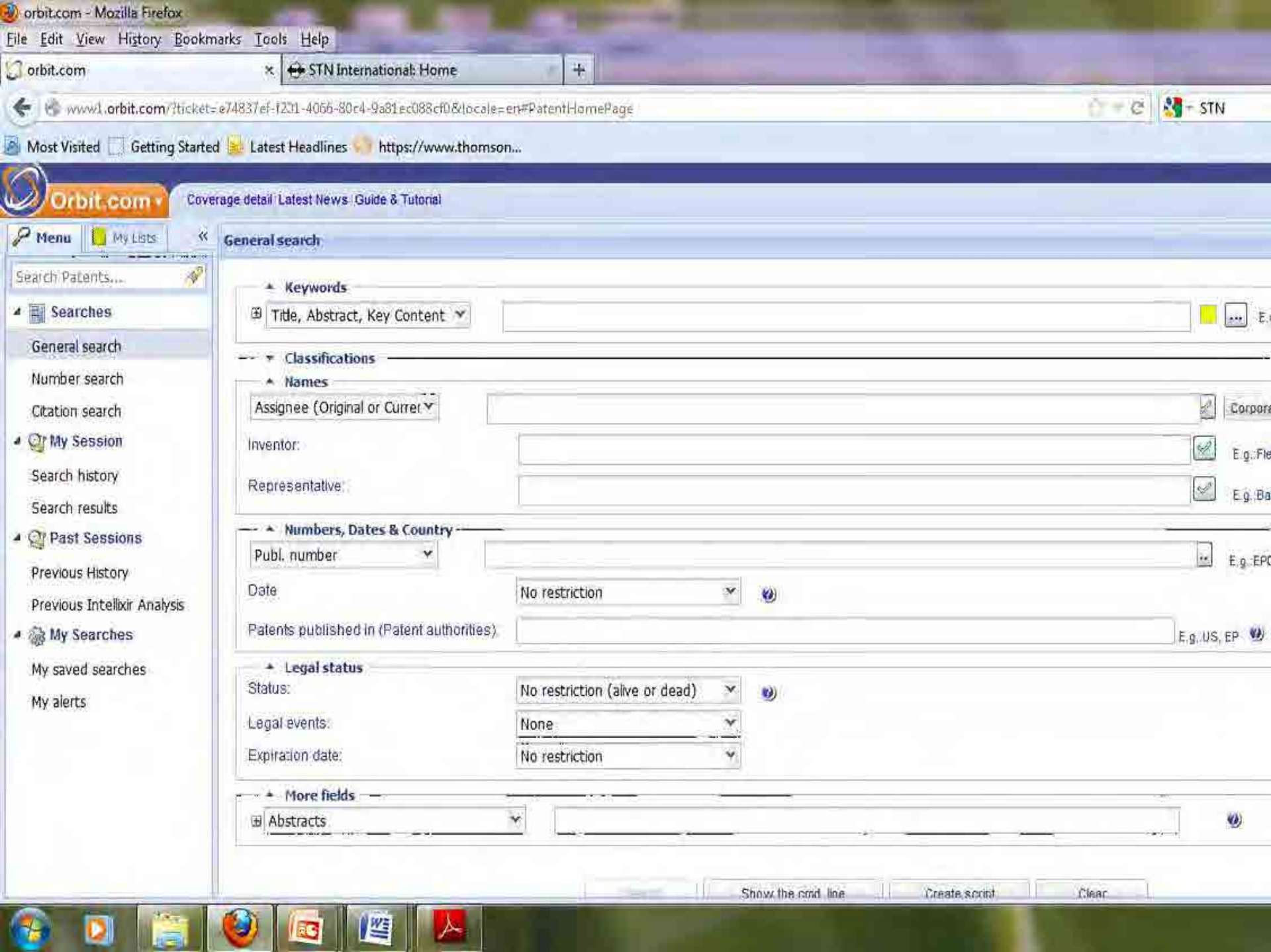
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