

# Patents – What They Are, Why They Matter, and How They Can be Handled in a Grant Application

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# Overview

- Types of Patents
- Patentability Requirements
- Enforcement & Freedom-To-Operate
- Patent Issues in Grant Applications
- Q&A



# *Types of Patents*

# What is Patent?

- A right granted by the government to an inventor to exclude others, for a fixed period of time, from making, using, selling, importing, or offering for sale the patented products, or using the patented method, or using, offering for sale, selling or importing the products made by the patented method.
- Territorial protection
  - Not automatic
  - Not universal - No “international” patent
  - US ≠ CN ≠ HK
- First-to-File
- Granted by the gov’t but policed by the right holders

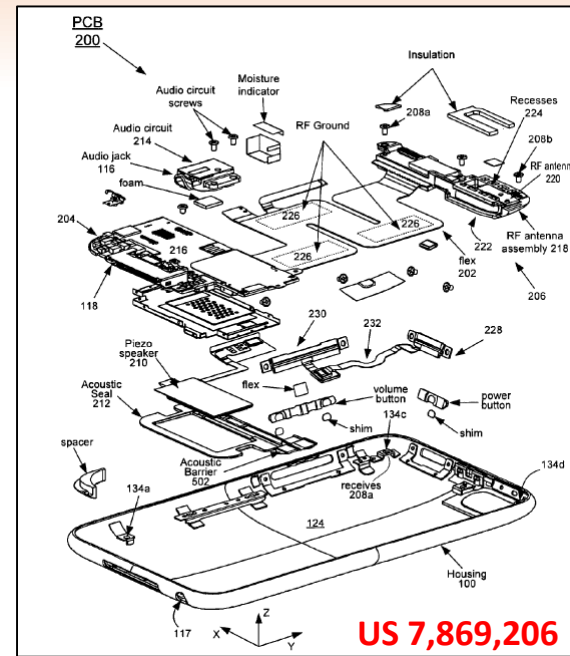


<http://www.fort-myers-patent.com/>

# Types of U.S. Patents

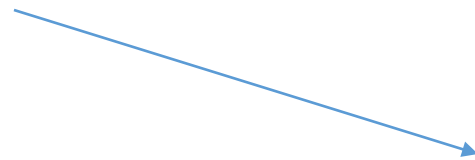
- Utility (= Invention)

- Process
- Machine
- Manufacture
- Composition of matter



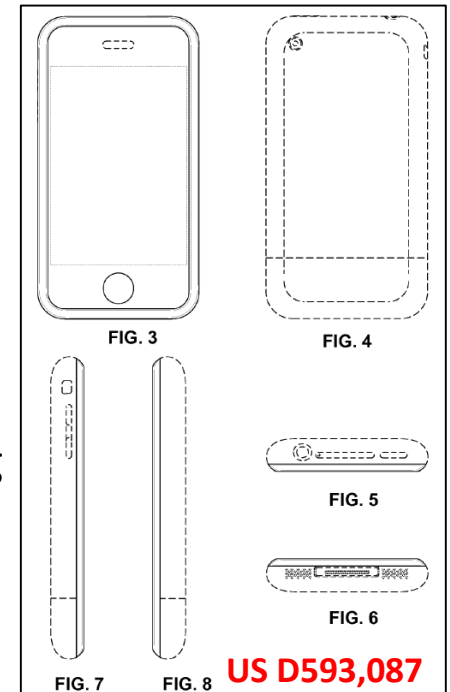
- Design

- Visual ornamental characteristics on an article of manufacture  
e.g. Apps icon, Coca-Cola bottle



- Plant

- Asexually reproduced plant
- *cf* sexually reproduced plants, seeds, methods of producing a plant





# Patent - U.S. vs China



U.S.			China	
Utility	20 years	=	Invention	20 years
Design	15 years	=	Design	10 years
Plant	20 years		/	
/			Utility model	10 years

U.S.	China	
<b>Utility Patent</b> 發明專利	<b>Invention Patent</b> 發明專利	<b>Utility Model</b> 實用新型
Any new and useful <b>process, machine, manufacture, or composition of matter</b> , or any new and useful improvements thereof	Any new technical solution relating to <b>a product, a process</b> or improvement thereof	Any new technical solution relating to the <b>shape, the structure</b> , or their combination, of <b>a product</b> , which is fit for practical use

# Patent - Hong Kong

- Design Patent 外觀設計

- 25 years

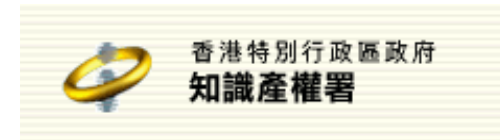
- Standard Patent 標準專利 (Re-registration of a granted patent)

- China
- United Kingdom
- European patent designating UK
- 20 years

- Short Term Patent 短期專利

- Formality examination
- 8 years

- Will implement a "original grant patent system" in late 2017 or early 2018



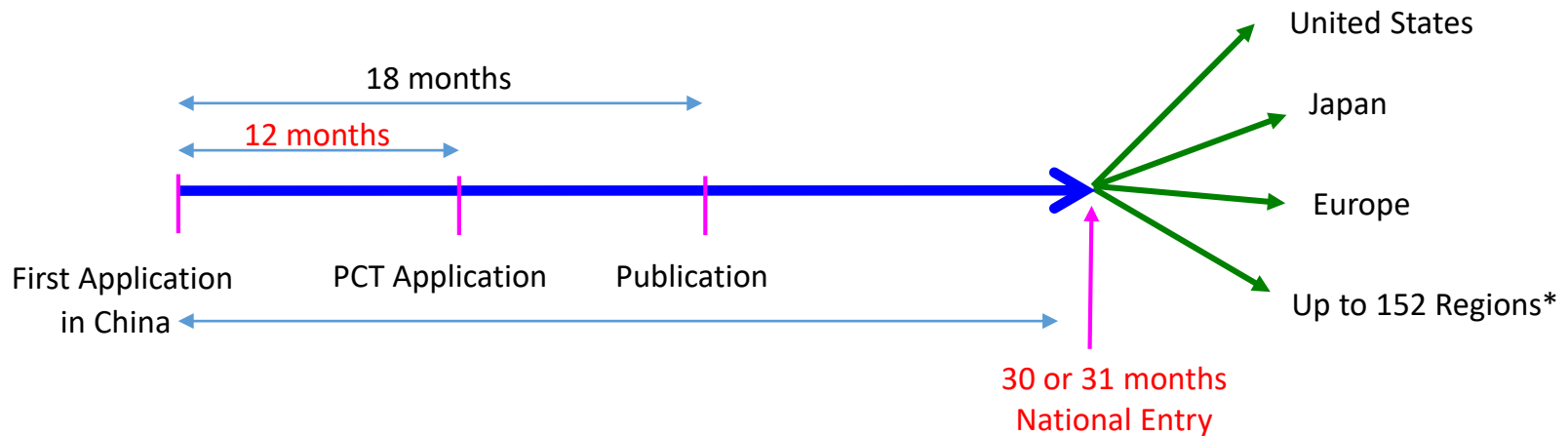
<http://www.ipd.gov.hk/chi/home.htm>

# When & Where – International Schemes

- **Time** is of the essence.
- **Territorial** in nature.
- Paris Convention
  - Right to claim the priority of a prior application within 6 months (industrial designs and trademarks) or 12 months (patents) in up to 177 regions
- Patent Cooperation Treaty (PCT)
  - One PCT application → Reserve right to file applications in up to 152 regions
  - File, prosecute, grant and maintain *independently* in each region of interest



# PCT – International & National Stage



- ✓ Preserve earliest filing date while delay filings
- ✓ Buy time to gather resources and strategize

\* Taiwan is not covered by PCT scheme

# *Patentability Requirements*

# Five Basic Patentability Requirements

- Statutory requirements for patentability (U.S.):
  - Patentable Subject Matters/Utility (35 USC §101)
  - Novelty (35 USC §102)
  - Non-obviousness (35 USC §103)
  - Written Description (35 USC §112)
  - Enablement (35 USC §112)
- 授予專利權的條件（中華人民共和國）
  - 授予專利權的發明和實用新型，應當具備新穎性、創造性和實用性。（專利法第二十二條）
  - 說明書應當對發明或者實用新型作出清楚、完整的說明，以所屬技術領域的技術人員能夠實現為準。（專利法第二十六條）

# Is Everything Patentable?

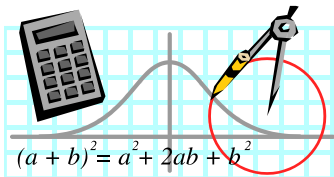
"Under section 101, a person may have invented a machine or a manufacture, which may include anything under the sun that is made by man. . . ."

*Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

# What Cannot be Patented?

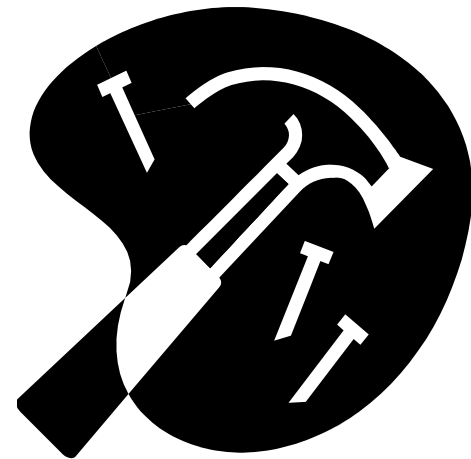
U.S.	China
Abstract idea	Rules and methods for mental activities
Laws of nature	Scientific discoveries
Natural phenomena	/
<b>Natural products</b> X Purified protein, gene, chemical etc.	/
/	<b>Methods for diagnosis or treatment of diseases</b> ✓ Products/devices for treating/diagnosing diseases ✓ Uses of composition to prepare drugs
Human organisms	Animal and plant* varieties
Sole utilization of special nuclear material or atomic energy in an atomic weapon	Substances obtained by means of nuclear transformation
	Invention violating laws, social ethics or harms the public interest e.g. human embryonic stem cells

\* Protected by other systems



# Utility

- Useful in commercial or industrial sense
- Specific and substantial utility (U.S.)
- Industrial applicability 實用性 (China, Europe, Japan)
  - Exclude methods for treatment, surgery, and diagnosis practised on human or animal body

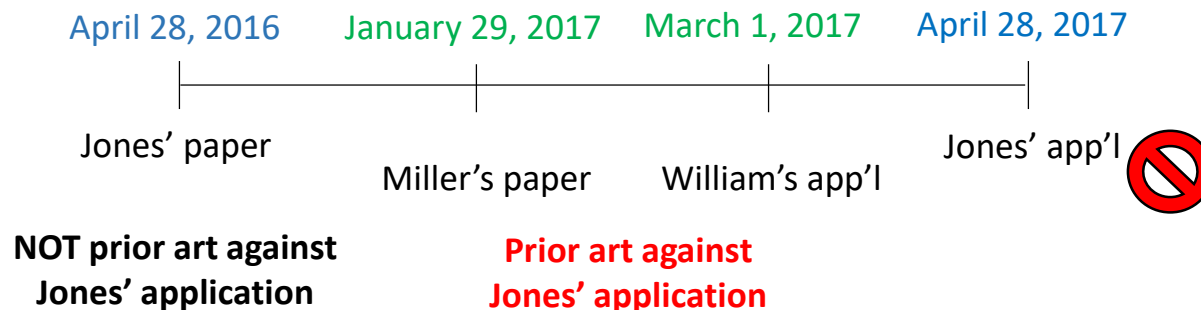


# Novelty

- Not novel when an invention is:
  - Described in a patent/patent application
  - Described in a printed publication
  - In public use (in U.S.)
  - On sale (in U.S.); or
  - Otherwise available to the public (e.g. oral presentation, social media)
- Anywhere in the world!
- Grace period (U.S. – 1 year)
  - Inventors can file a patent application after disclosure made by the inventors, or a third party who obtained the invention from the inventors.



***First to file!***



# Non-obviousness (Inventiveness)

- Teaching or motivation in a combination of disclosures and/or common knowledge in the field such that ...
- **Without inventiveness**, a person having ordinary skill in the field would have arrived at the same invention with these disclosures and knowledge
- “Obvious to try” with a reasonable expectation of success



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# Non-obviousness (Inventiveness)

Exemplary rationales that may support a conclusion of obviousness include:

1. Combining prior art elements according to known methods to yield predictable results;
2. Simple substitution of one known element for another to obtain predictable results;
3. Use of known technique to improve similar devices (methods, or products) in the same way;
4. Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
5. “Obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
6. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
7. Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

# Written Description and Enablement

- Quid Pro Quo (Something for Something):
  - Patentee gets the **right to exclude** others for a period of time
  - Public gets **full disclosure** of the inventor's best ideas about how to make and use the invention
  - **CANNOT withhold** necessary details of your invention to prevent others from copying
- Three distinct disclosure requirements (35 U.S.C. §112)

## Written Description

- Describe in full, clear, concise and exact terms
- **Show possession** of full scope of an invention

## Enablement

- Enable one skilled in the art to make and use the claimed invention without **undue experimentation**
- Working example(s) and methodology

## Best Mode

- **Must** disclose the best mode of making and using the invention as contemplated
- Do NOT need to point it out

# Support for a Broad claim - Predictability

What you have:

*Saccharomyces cerevisiae* secreting human growth factor X



Claim 1. A **microorganism** capable of secreting a **human growth factor**.



Claim 2. The microorganism of claim 1, wherein the microorganism is a **protozoan, a fungus, a yeast or a bacterium**.



Claim 3. The microorganism of claim 1, wherein the microorganism is a **yeast**.

Claim 4. The microorganism of claim 3, wherein the human growth factor is **human growth factor X**.



Claim 5. The microorganism of claim 1, wherein the microorganism belongs to the genus **Saccharomyces** and the human growth factor is **human growth factor X**.

# Broad Claims - Unpredictability

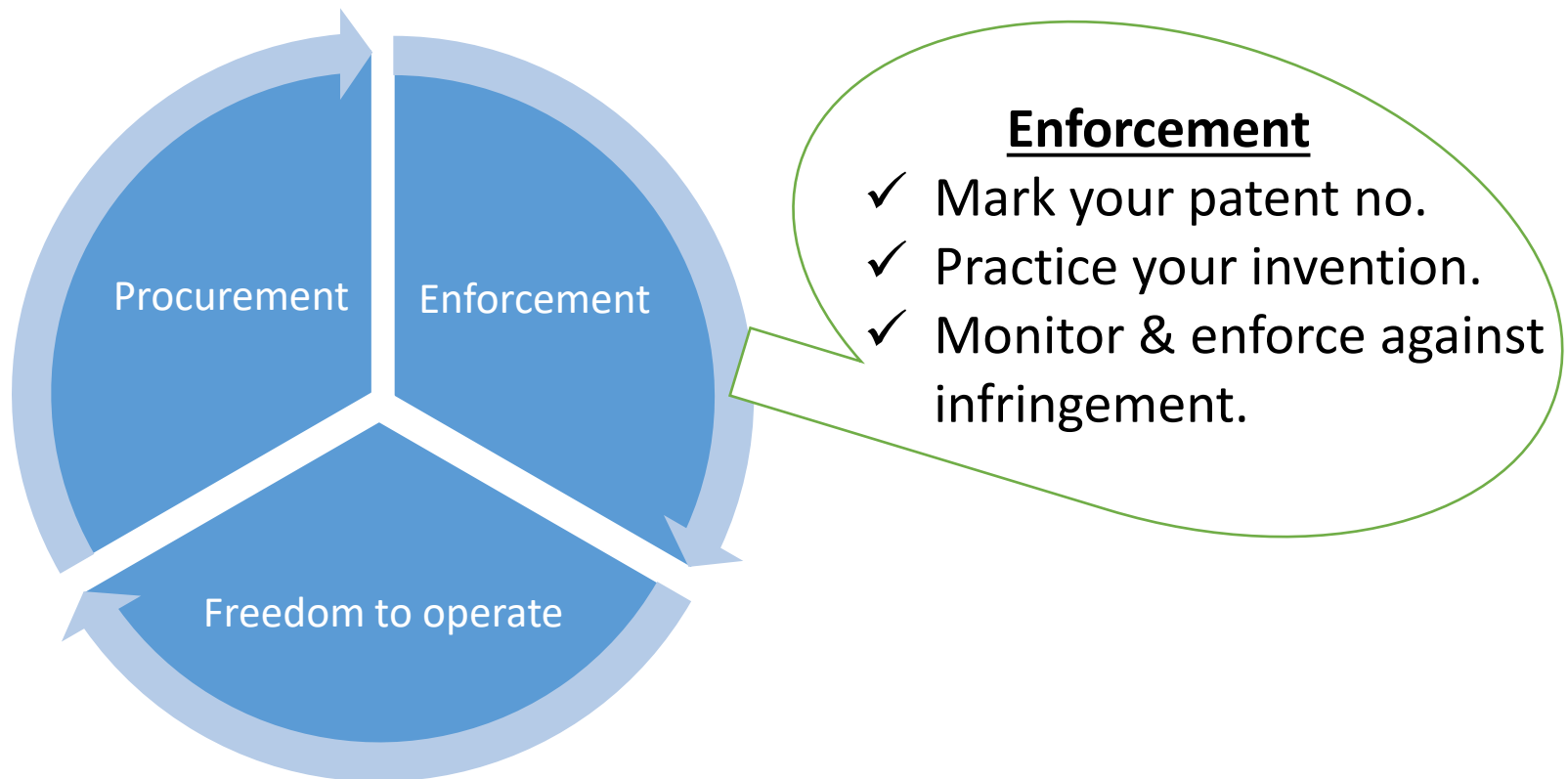
- We all want the broadest protection
- Whether the claim
  - Has gone beyond what is disclosed in the written description?
  - Is adequately supported by the written description?
- Independent claims: reasonable scope
- Dependent claims: cover individual variants described in the specification



# *Enforcement & Freedom-To-Operate*

# I Got the Patent - Happily Ever After?

I can exclusively and freely practice my invention till my patent expires !(?)



# Freedom to Operate

*"I have a patent but why can't I use it"*



- Patent is NOT a positive right but a right to exclude.
- Patentable ≠ Not infringing.
- Freedom to operate (FTO)
  - Whether an activity can be done without infringing IP rights of a third party?
  - Any valid IPs covering the components or activities essential for practicing your invention in a particular country ?
- Patent - iPSC
  - License (permission to use)
  - Challenge patent validity or enforceability
- Takeaway: Time to time FTO base on actual product/process

# *Patent Issues in Grant Applications*



# Grant Submission – Risks of Disclosure

- **Whether submission of a grant application jeopardizes the patent rights?**
- Disclose objectives, technical info & data → Absolute confidence?
  - ✓ Confidentiality policy of the funding/review agency
  - ✓ Publication policy
  - ✓ Inadvertent disclosure or subconscious utilization of ideas by reviewers
- **Recommendations:**
  - File a U.S. provisional application no later than the date of submission (USD 130).
  - Keep the grant proposal as general as possible. Avoid including overly detailed description of what you plan to do unless it is necessary.
  - Check agency's policies regarding confidentiality and publication in advance. Seek exemption from publication if possible.

# Grant Proposal – Patentability & FTO Issues

- How are you going to protect the IP resulting from your innovation?
  - ✓ Are your deliverables something patentable and commercializable?
  - ✓ Potential markets ? Market size?
  - ✓ Competitive advantages of your products?
  - Evaluate the commercial potential and feasibility of your invention
  - Identify potential competitors and your market niche
- Patentability and Freedom-To-Operate
  - ✓ Do you aware of any similar technology?
  - ✓ How would the prior art affect the patentability of your invention?
  - ✓ What is the risk of infringement?
  - Prior art/patent search

# Prior Art

- Prior art affects the **patentability** of an invention.
- Information available in the public in any form *before* the effective filing date.
  - Journal articles, books
  - Published patents and applications
  - Thesis, company brochures
  - Website, online database of clinical trials
  - Oral, poster, slide presentation
- Cut-off time for prior art search
  - Before filing → Any public information
  - After filing → Any public information before the filing date/priority date

# Database for Prior Art/Patent Search

## **Patent (Free)**

- SureChem
- [Google Patent Search](#)
- Free Patents Online
- [Patent Offices](#)  
e.g. USPTO, EPO, SIPO

## **Patent (Paid)**

- Delphion
- Lexis
- Westlaw's Patent Database

## **Non-Patent Search**

- PubMed
- Google Scholar
- SciFinder
- Web search engines



# Advanced Patent Search

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10 results

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<b>Date</b>	<input checked="" type="radio"/> Return patents anytime <input type="radio"/> Return patents between <input type="text"/> and <input type="text"/> e.g. 1999 and 2000, or Jan 1999 and Dec 2000	
<b>Restrict date by</b>	<input checked="" type="radio"/> Restrict by filing date <input type="radio"/> Restrict by issue date	

# Patent database

- **WIPO** World Intellectual Property Organization  
<http://www.wipo.int/patentscope/en/>



- **USPTO** United States Patent and Trademark Office  
<http://www.uspto.gov/patents-application-process/search-patents>



- **EPO** European Patent Office  
[http://worldwide.espacenet.com/?locale=en\\_EP](http://worldwide.espacenet.com/?locale=en_EP)



- **SIPO** State Intellectual Property Office  
<http://www.pss-system.gov.cn/sipopublicsearch/portal/uiIndex.shtml>





https://worldwide.espacenet.com/advancedSearch?locale=en\_EP

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Title:  plastic and bicycle

Title or abstract:  hair

Enter numbers with or without country code

Publication number:  WO2008014520

Application number:  DE201310112935

Priority number:  WO1995US15925

Enter one or more dates or date ranges

Publication date:  2014-12-31 or 20141231

Enter name of one or more persons/organisations

Applicant(s):  Institut Pasteur

Inventor(s):  Smith

Enter one or more classification symbols

CPC  F03G7/10

IPC  H03M1/12





中文

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Français

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常规检索

高级检索

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热门工具

命令行检索

> 专利分析

> 专利服务

当前位置: 首页 >> 高级检索

范围筛选

中国:

中国发明申请

香港

中国实用新型

澳门

中国外观设计

台湾

主要国家和地区:

EPO

WIPO

美国

日本

韩国

英国

法国

德国

俄罗斯

瑞士

其它国家和地区:

奥地利

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发明名称

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申请(专利权)人

发明人

优先权号

?

优先权日

摘要

权利要求

说明书

关键词

# What to Search?

- 1) Search by name of inventor/institute/company that have been working on or likely to work on that particular invention
- 2) Keywords search - Brainstorm initial keywords
  - Start with keywords you familiar with
  - Next, include *synonyms* and *equivalents* that can be associated with each part of the invention

	<b>Search Within</b>	<b>Results</b>
1	Title of Invention	Vague. Least reliable.
2	Abstract (Brief summary of the invention)	Narrow. Identify <i>potentially</i> relevant documents.
3	Specification (Full description of the invention)	Board. Usually return many irrelevant hits.
4	Claims (Define scope of patent rights)	Determine freedom-to-operate.

# Analysis of search

Your invention	Feature A	Feature B	Feature C	Feature D	Feature E
Patent X	x	x	x	x	x

→ Lack of novelty

Literature Y	x	x	x	x	
Patent Z	x	x		x	x

- Novel
- Not inventive if one would have arrived at your invention in view of Y & Z

# Takeaway

- ✓ Time is of the essence. Avoid delay in seeking IP advice and filing applications.
- ✓ Be cautious about all potential disclosure. File PRO when in doubts. [\$130 only and will not be published!!!]
- ✓ Do prior art search to assess patentability. Combination of several databases may give a more comprehensive result.
- ✓ Educate researchers and students on IP issues.

# THANK YOU!

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