



TRINITY COLLEGE DUBLIN  
COLÁISTE NA TRÍONÓIDE, BAILE ÁTHA CLIATH

THE  
UNIVERSITY  
OF DUBLIN



Graham McMullin, BA BAI, Ph.D  
Technology Transfer Case Manager - Physical Sciences  
Trinity Research & Innovation Office

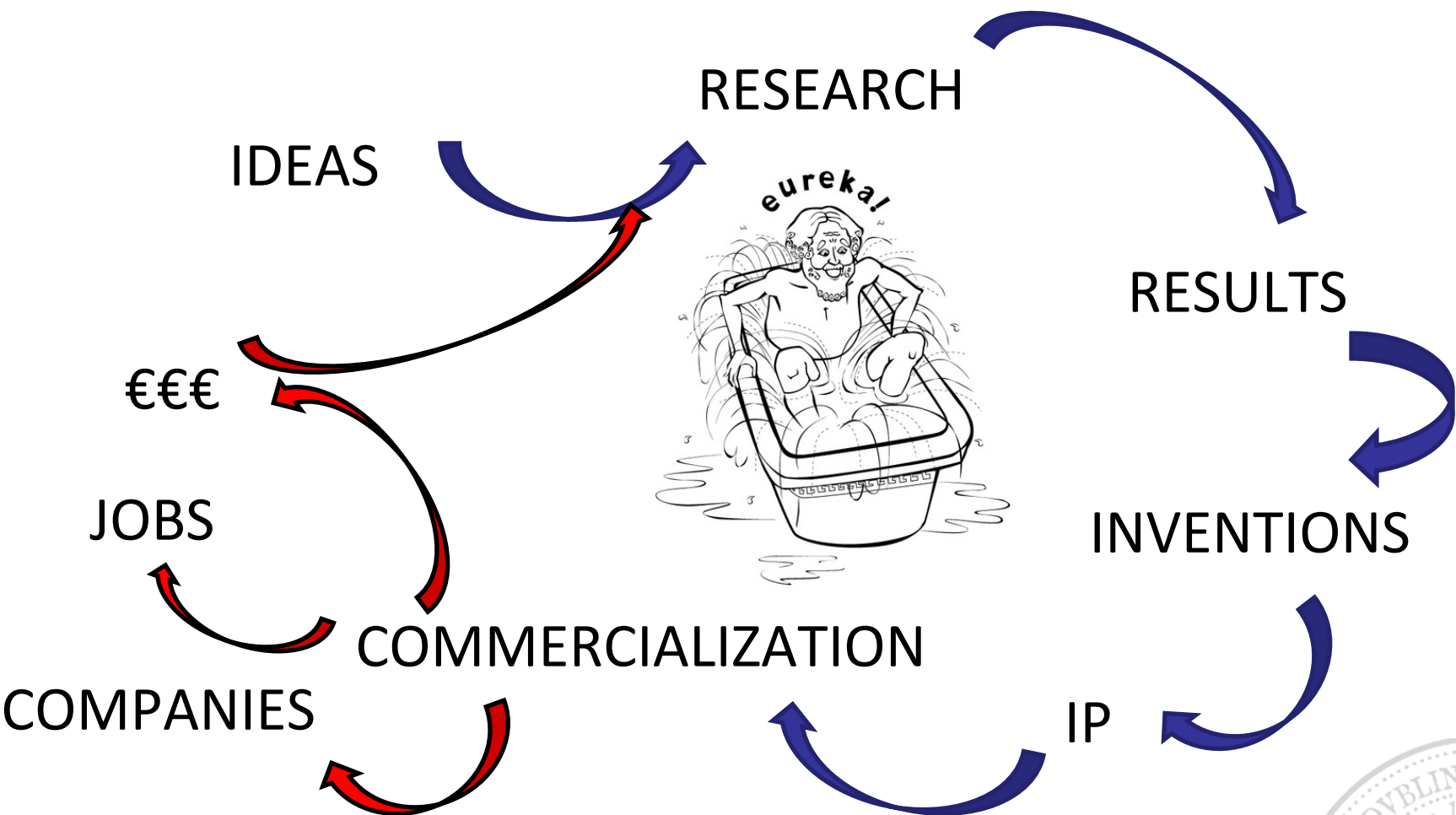




## Agenda

- 1: Intellectual Property
- 2: Patents
- 3: Patent Process
4. Licensing IP







1

# INTELLECTUAL PROPERTY





## What is IP?

Intellectual property is a product or creation  
of the  
human intellect or mind





## Why Protect IP?

To vest your intellectual property with a value

- that you can commercially exploit IP
- ensure exclusivity of use
- that you can sell or trade
- bargaining tool, attracts investors
- obstruction to others
- incentivizes innovation and economic growth
- move aspects of technology in controllable manner

Government policy, Social obligation, Income,  
Industry relationships





# Protection of IP

## Patents

- Bio
- Nano/Physical
- Processes
- Designs
- Formulations
- Devices

-fixed term protection usually 20 years  
-requires registration

## Copyright©

- Books
- Presentations
- Works of literacy
- Films

-fixed term protection usually author's life + 70 years.  
-No registration required

## Trademarks™





# Protection of IP

## Trade secrets

- Coca-cola
- KFC recipe
- WD-40

- No fixed term
- Protection through confidentiality
- no policing necessary, control over use

## Plant breeders rights

- Seeds, cuttings, divisions
- Fruits, flowers, foliage

## Geographical indications

- Champagne
- Bordeaux
- Stilton
- Tequila
- Irish Whiskey





# Trademark™

Words, names, symbols, sounds, or colors that distinguish goods and services from those manufactured or sold by others and to indicate the source of the goods.

Trademarks, unlike patents, can be renewed forever as long as they are being used in commerce-15 year term

Establishes a strong connection, in the minds of the consumers. between a specific product and service

Geography, advertising, publicity

For example, the COCA-COLA , SONY, iPhone and NIKE brands have been determined to be strong and famous



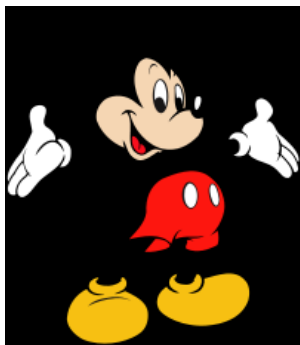


# Copyright©

Protects original expression  
The author controls/directs the use  
Does not require registration

Term: Canada-Life of author + 50yrs  
US/IE -Life of author + 70yrs

Literature, Sound recordings, Typographical  
arrangement, Films, Computer-generated work,  
Original database, Photographs etc.



1928  
Copyright & Trademarked





# 2

# PATENTS





# Patents

Set of exclusive rights granted for a fixed period of time (~20yrs) in exchange for public disclosure of the invention

***Novelty*** - Complete non-disclosure is essential

***Inventiveness*** - Involve an inventive step and be non-obvious

***Useful*** - Capable of industrial application; have utility





## Novelty-No prior art

*“Prior art = body of existing knowledge in the public domain”*

What is a public disclosure?

- presentations, oral or poster outside lab eg. hall
- publications in journals or web
  - discussions to Joe Public
- blogs, facebook, tweeting, bebo
- ‘enabling’ information to one ‘skilled in the art’

What is confidential?

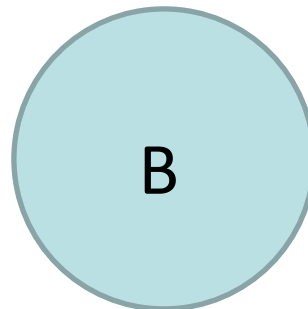
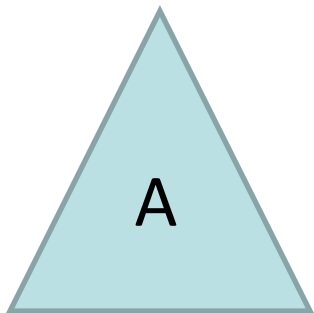
- internal lab meetings, closed thesis defense/viva
- grant applications, manuscripts in review
- information provided under confidentiality agreement
- collaborators





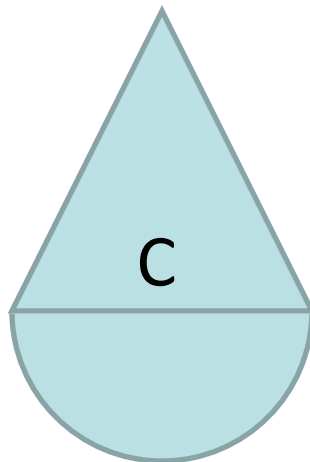
# Inventive Step

Prior Art



Knowing A and Knowing B

Would one skilled in the art not come up with C?

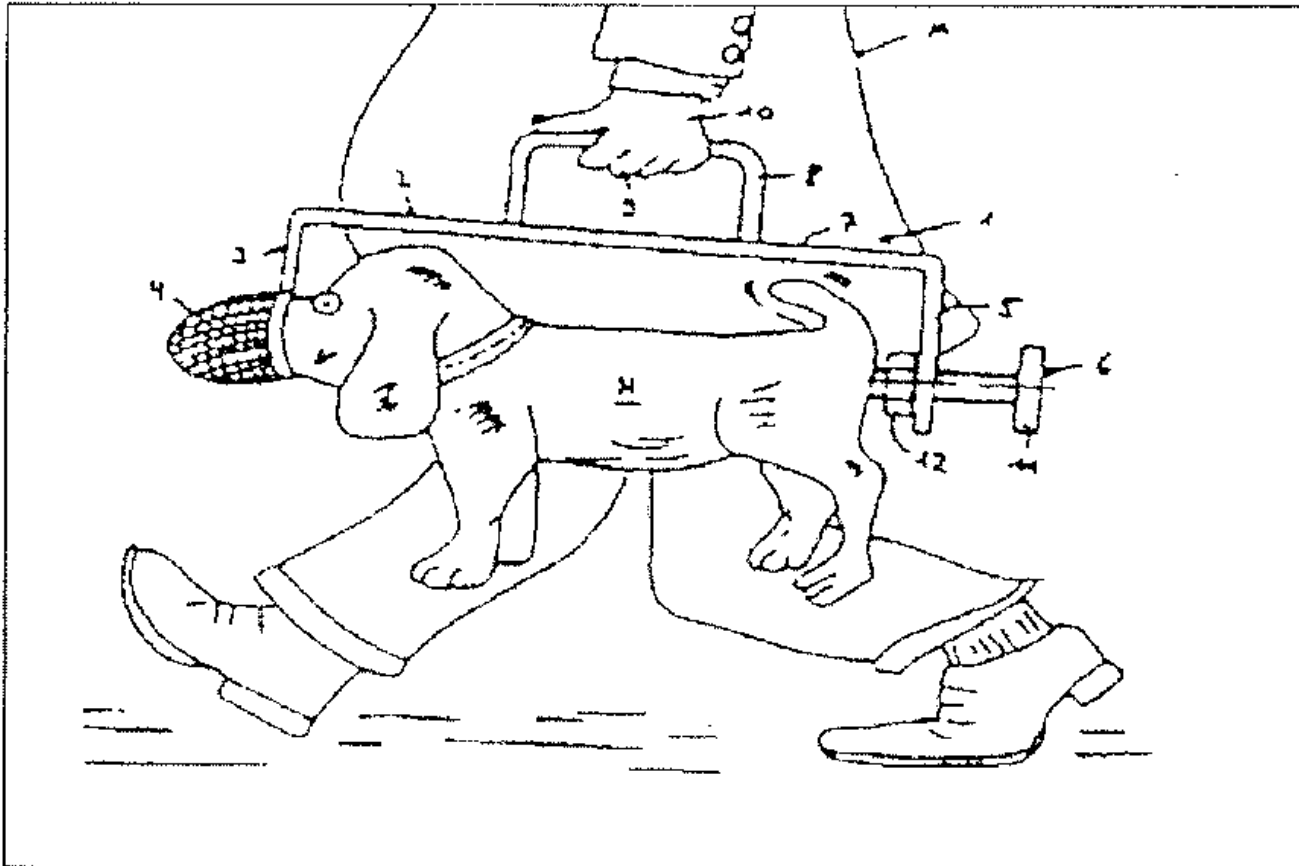


New invention





# Does it have Utility?



A dog-carrying device





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

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
7 October 2004 (07.10.2004)

PCT

(10) International Publication Number  
WO 2004/086044 A1

(51) International Patent Classification<sup>7</sup>: G01N 33/543, 33/58, B01J 13/00

(21) International Application Number: PCT/IE2004/000047

(22) International Filing Date: 29 March 2004 (29.03.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003/0234 28 March 2003 (28.03.2003) IE  
60/483,010 27 June 2003 (27.06.2003) US

(74) Agents: O'BRIEN, John. et al.; c/o John A. O'Brien & Associates, Third floor, Duncairn House, 14 Carysfort Avenue, Blackrock, County Dublin (IE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (for all designated States except US): THE PROVOST, FELLOWS AND SCHOLARS OF THE COLLEGE OF THE HOLY AND UNDIVIDED TRINITY OF QUEEN ELIZABETH NEAR DUBLIN [IE/IE]; College Green, Dublin 2 (IE).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and  
(75) Inventors/Applicants (for US only): BRENNAN, Margaret, Elizabeth [IE/IE]; Ballinroo, Casteiney, Templemore, Co. Tipperary (IE). ARMSTRONG, Gordon, James [IE/IE]; Silverdale, Woodcock Hill Road, Lower Meelick, Co. Clare (IE). KELLY, John, Moffat [GB/IE]; 14 Killiney Gate, Killiney, Co. Dublin (IE). WHELAN, Aine, Marie [IE/IE]; 31 Bellview Avenue, Glenageary, Co. Dublin (IE).

Published:  
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 2004/086044 A1

(54) Title: SENSOR FOR DETECTING AN ANALYTE USING SILVER NANOPARTICLES

(57) Abstract: A sensor comprises silver nanoparticles in which substantially all of the surfaces of the silver nanoparticles are available for interaction with an analyte or for functionalisation with a receptor which is capable of interacting with an analyte. Silver nanoparticles are prepared by forming the nanoparticles in the presence of a polymeric stabiliser such as PVA.

## Example of the front page of a patent application

- Application Numbers
- Priority Date
- Applicant(s)
- Inventor(s)
- Patent Agent
- Title
- Abstract





# 3

# PATENT PROCESS





0 mths



## Step 1-Priority Filing

Establishes priority date/birth date of patent

First-to-file countries

US first-to-invent system

Can file with most patent offices;

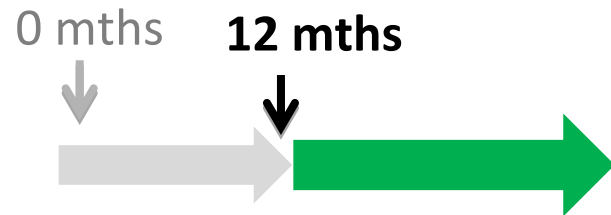
European Patent Office

United States Patent & Trademark office

Irish Patent & Trademark Office

IE(€60), EP(€1250) or US(€750)





## Step 2-PCT Filing

- The **Patent Cooperation Treaty (PCT)** is an international law treaty, concluded in 1970.
- It provides a unified procedure for filing patent applications to protect inventions in each of its Contracting States (142 countries)
- A patent application filed under the PCT is called an **international application** or **PCT application**.

### Final chance to

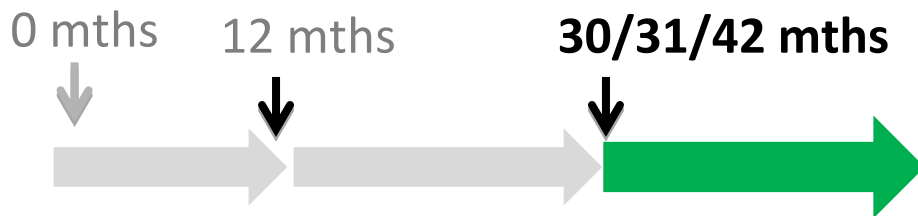
- add supporting data
- amend claim set
- add inventors
- filing fees (€2700+)





## Step 3-National Phase

international phase ends and the international application enters in national and regional phase



- US 30 months
- EP 31 months
- Canada 42 months

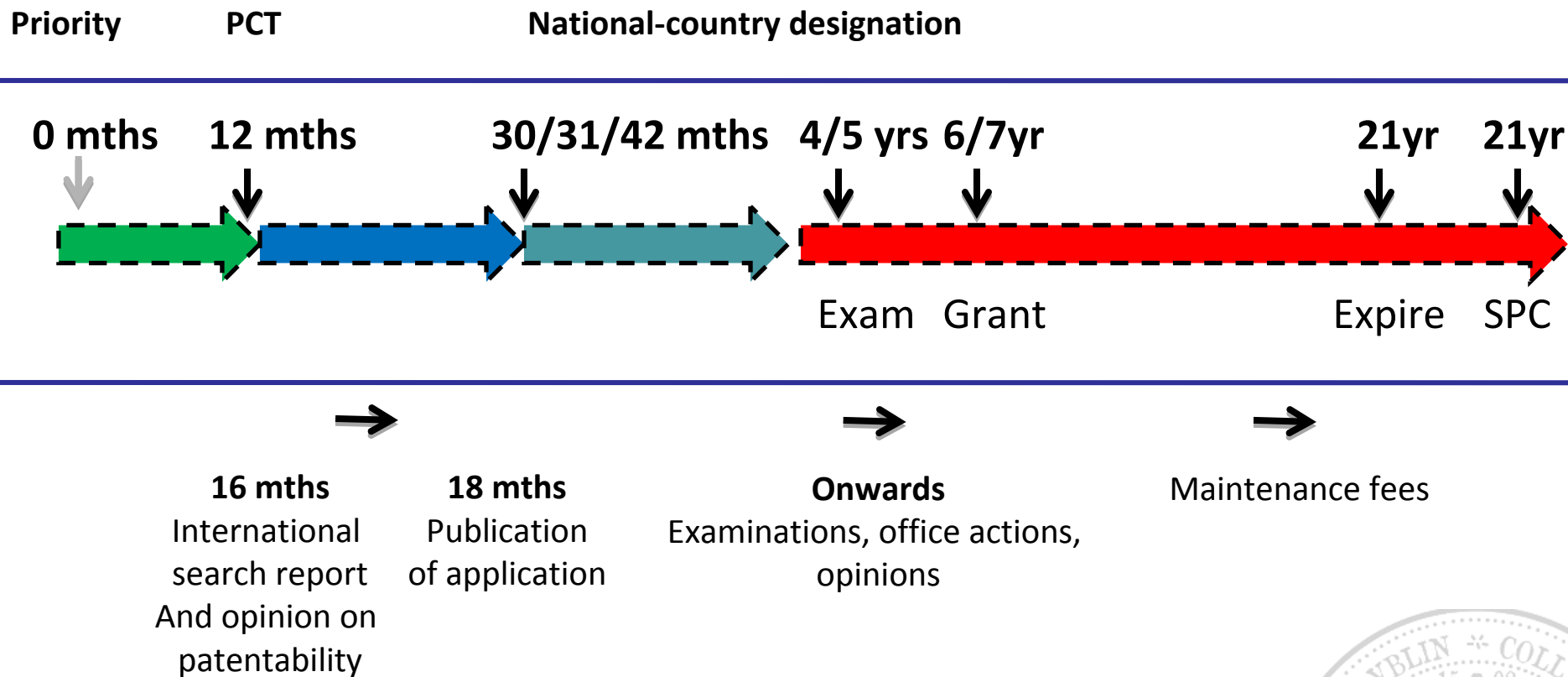
€€ €€ €€

US and Europe ~€5k each,





# Overview





# Types of patent applications

**Short Term Irish** Not examined, limited value, up to 5 claims, <1 year to grant, 10-year patent

**Full Term Irish** Examined (not in Ireland), 1-3 years to grant, 20-year patent

**Full Term GB** Examined in GB, 2-3 years to grant, 20-year patent

**Full US patent** Examined in US, 2-3 years to grant, 20-year patent

**Preliminary US Patent** → **Full US patent** Examined in US, 2-3 years to grant, 20-year patent

**EPO patent** → SR → **Nationalise in European countries**

Search report (6-9months). Examined at EPO, 2-3 years to grant, 20-year patent from Initial Filing

**EPO patent/Irish Patent/Preliminary US patent** → SR → **PCT** → SR → **Nationalisation in any of 139 countries**

EPO Search report (6-9months). PCT: Can modify claims for PCT. Can add in substantiating data. PCT Examined at EPO, PCT search report after 6-9 months, Nationalisation: 18months after PCT 2-3 years to grant depending on prosecution, 20-year patents from Initial Filing.

**EPO patent/Irish Patent/Preliminary US patent** → SR → **PCT** → SR → **Nationalisation in any of 139 countries**  
↓  
**Divisional Patent** → **Nationalisation**

Unity of Invention objection from examiners. Can file parallel divisional application.

**Full US patent** → SR → **US Continuity or Continuity in part (CIP)** Ability to patent research development improvements

t=0

t=12

t=18

t=30/31

t (months)





# Patent Numbering (examples)

Short Term Irish

Application: IE/S2008/1234

Patent S83974

Full Term Irish

Application: IE/2001/1111

Patent: EP 1,386,079

Full Term GB

Application: GB/0823420

Patent: GB 2371921

Full US patent

Application: US 12/284,093

Patent 1,234,567

Preliminary US Patent

Application: US 61/192,433

Patent 1,234, 567

Preliminary EPO patent

Application: EP99650106.0

Patent: EP 1,099,484

PCT

Application: PCT/IE2008/000124

Published: WO2009081386





# Patent Strategy

- Patent strategy chosen depends on
  - type of invention (disruptive, step improvement over existing technology)
  - likely geographic market
  - whether search report is required to understand state of the art
  - whether more substantiating data is required or not
  - whether this is a follow on patent or new filing
  - whether there is commercial interest or not
  - Whether this invention is standalone or requires further research / inventions to make a product
  - available funds





# Patent Protection

A granted patent (or pending patent) will exclude others from selling a product containing your IP in the country the patent is granted – for the patent term.





# 4

# LICENSING





# License Agreements

Once you have a patent application (or granted patent) you can use it as a tangible asset to license to a company – in lieu of

- Upfront fees
- Milestone payments and/or
- Royalty payments

## 2 types of license

### Non-exclusive license

- Same rights to an intellectual property granted to several licensees within the same scope or field
- €€

### Exclusive license

- Only one licensee can have rights to the IP
- If multiple applications-exclusivity in field of use





## Trinity Research & Innovation - O'Reilly Institute



Steps between the Hamilton & O'Reilly Buildings, East End. Left into ORI,  
first door on right



## Useful Websites

<http://www.patentsoffice.ie/>

<http://www.cipo.ic.gc.ca>

<http://gb.espacenet.com>

<http://www.google.com/patents>

<http://www.wipo.int/portal/index.html.en>

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

<http://www.epo.org/index.html>

<http://www.patentlyo.com/>

<http://www.iphandbook.org/handbook/index.html>





# Case Study: eblanaphotonics™

precision light for advanced communication

- Company formed in December 2000
- IP licensed from EI, TCD and NMRC
- 2 patents licensed from TCD & option on improvements; royalty on products, patent costs
- EI, NMRC (NUI Cork) and TCD Shareholders
- Company strongly interacts with TCD and NMRC
- Recognised as a campus company of TCD
- Premises in Enterprise Centre, 7 minutes from lab
- Venture Capital raised from ACT (leading Irish VC house), EI and international private investors

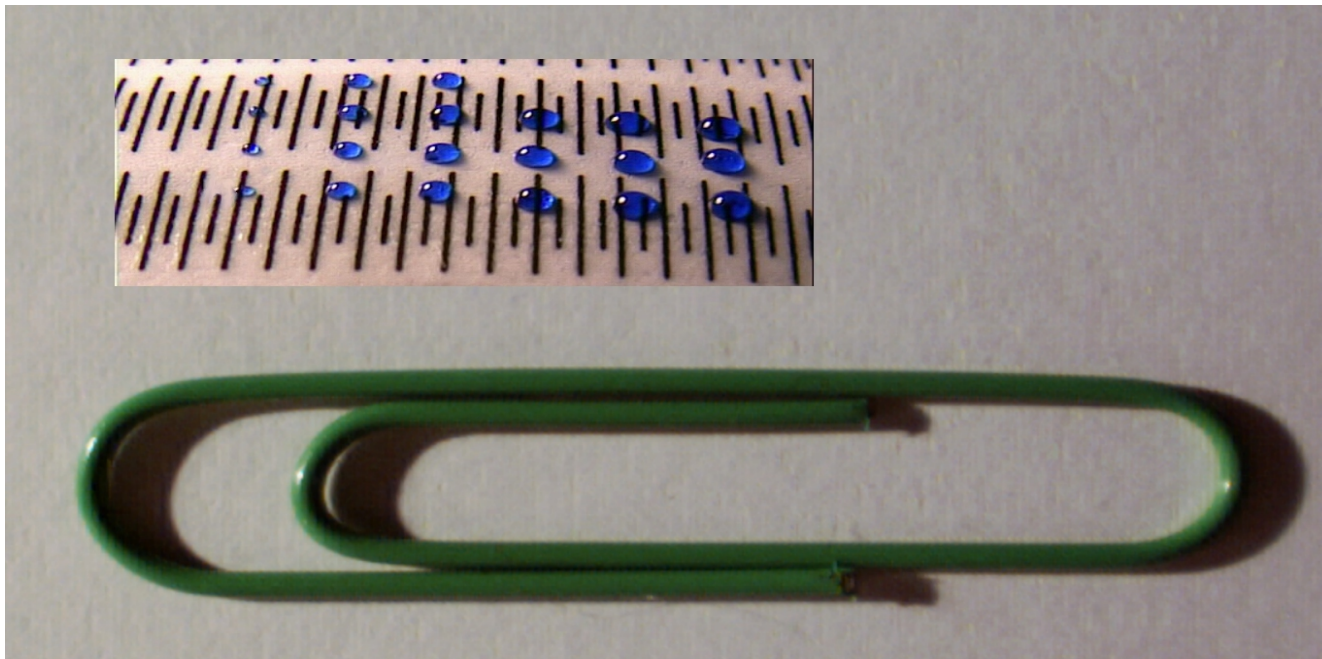
[www.eblanaphotonics.com](http://www.eblanaphotonics.com)





# Allegro Technologies Ltd

- **accurate and reproducible delivery of nanolitres of biological fluids for analysers.**



Advanced surface microscopy studies in the Department of Physics and collaboration with the led to the Department of Clinical Medicine formation of a campus company.

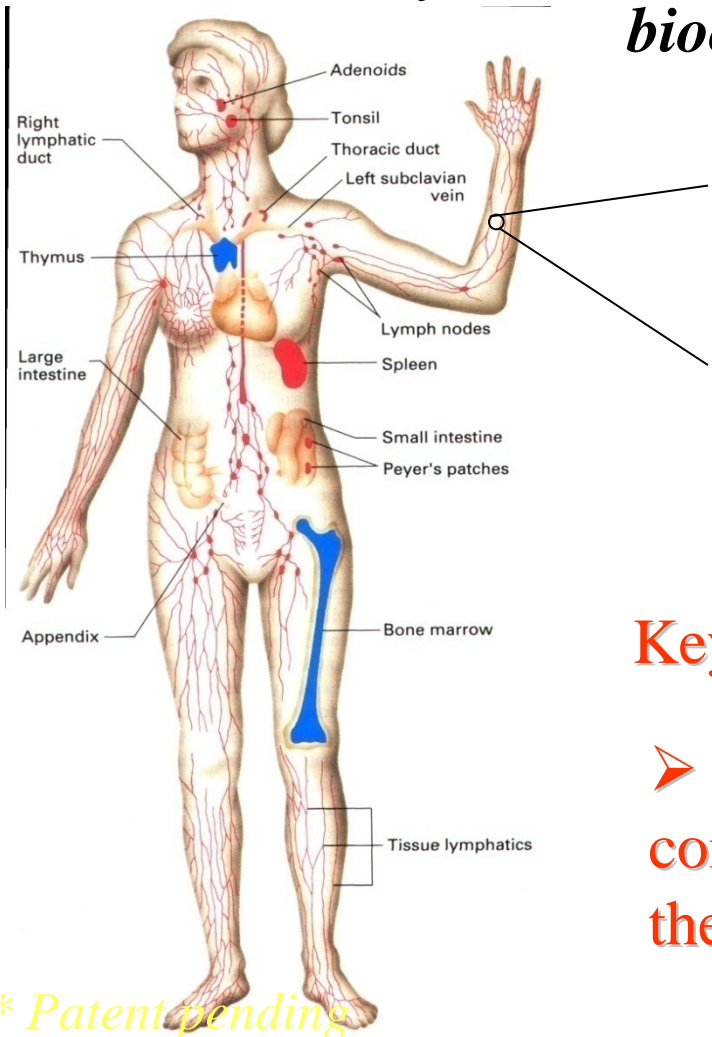




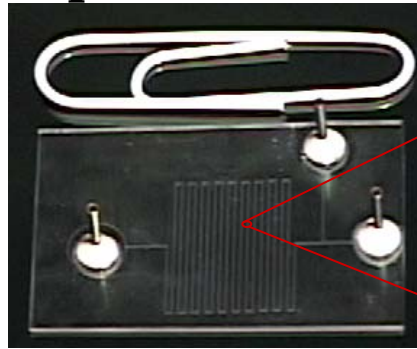
# cellix

## Technology

### Human Body

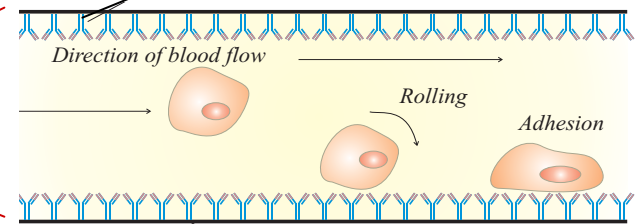


### Mimicking a capillary: biochip structure\*



### Simulating in vivo

### scenario: Immobilized antibody imitating natural ligands



### Key Technology:

- Method for performing cell assays in the continuous flow regime thereby simulating the in vivo environment more closely.

\* Patent pending

