



Protect your IP in Medical Technology: Focus on Oncology

**Patent protection for EU
funding beneficiaries**

An IP training series offered by the
European Patent Office and the
European IP Helpdesk





Series protect your IP in

- Protect your IP in quantum technologies: Focus on quantum computing. (20th March 2026)
- Protect your IP in health technology: Focus on robotics and health appliances (24th June 2026)
- Protect your IP in medical technology: Focus on oncology (15 July 2026)
- Protect your IP in biotechnology: Focus on water treatment technologies (Tbd October 2026)
- Protect your IP in green technologies: Focus on offshore energy (Tbd Nov/Dec. 2026)



Agenda

10.00 Introduction

Jürgen Mühl, European Patent Academy, EPO

Michele Dubbini, IP Advisor European IP Helpdesk

10.05 Innovation market and trends in Medical Technology and Oncology

Ilja Rudyk, Patent Analyst, EPO

10.25 Patentability issues in Focus on Medical Technology and Oncology

Shiri Burema, EPO Examiner

10.45 Case Study from HEU funded project: PERSEUS

Giancarlo Salviati, senior scientist, IMEM-CNR, Nicoletta Marigo, Research Manager, IMEM-CNR

11.05 Short Overview of the European IP Helpdesk and EPO Academy services

Jürgen Mühl, European Patent Academy, EPO

Michele Dubbini, IP Advisor European IP Helpdesk

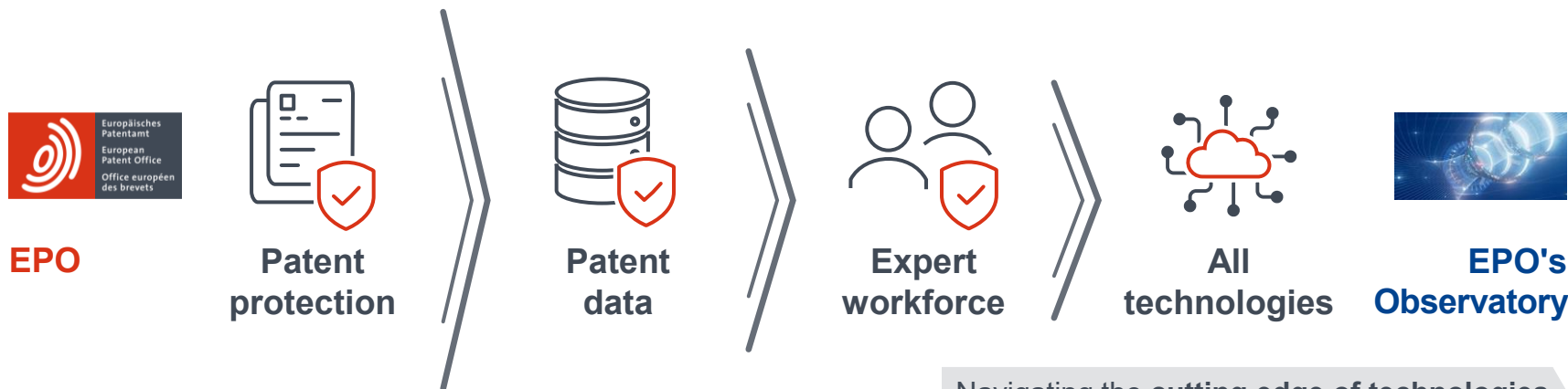
11.15 Q&A

11.30 End of the Event

PROTECT YOUR IP IN MEDICAL TECHNOLOGY: ONCOLOGY

ILJA RUDYK | SENIOR ECONOMIST | 15 JULY 2026

USING THE EPO'S RESOURCES, PATENT INTELLIGENCE AND NETWORKS TO BETTER UNDERSTAND THE FUTURE OF INNOVATION



Navigating the **cutting edge of technologies**

~4 000 patent examiners

Database of **160+ million patent documents**

Covering **46 countries** on the basis of a single application, with almost **200 000 EP applications** in 2024

TRANSFORMING PATENT DATA INTO EVIDENCE-BASED INNOVATION INSIGHTS

WHAT WE DO



Analyse and monitor technology trends



Publish research and case studies



Develop tools for the innovation ecosystem



Reach out to stakeholders through engagement activities



Support EU institutions with data-driven insights and technology cartographies

PURPOSE AND ADDED VALUE

To support better decisions by revealing innovation trends, anticipating emerging technologies, and strengthening Europe's competitiveness.

FOCUSING ON HEALTH, THE OBSERVATORY STARTED TACKLING THE AREAS OF COMBATting CANCER

Observatory publications



In-depth **analysis** of **technological trends** over **50 years** for **cancer**, and over **20 years** for **assistive robotics**

Most promising technologies, regional and sectoral variations, and **players** in cancer innovation

Forthcoming: **AI in medicine (Q4 2026)**

Technology platform on combatting cancer

- **Free** advanced Espacenet search
- **Global patent databases** describing cutting-edge cancer technologies
- **Easier access** for **researchers** and **innovators** to patent knowledge



Deep Tech Finder with 17 oncology filters

- Containing profiles of **1 700 oncology startups** and **600 research institutions**
- VC funds: **investors** interested in health sector



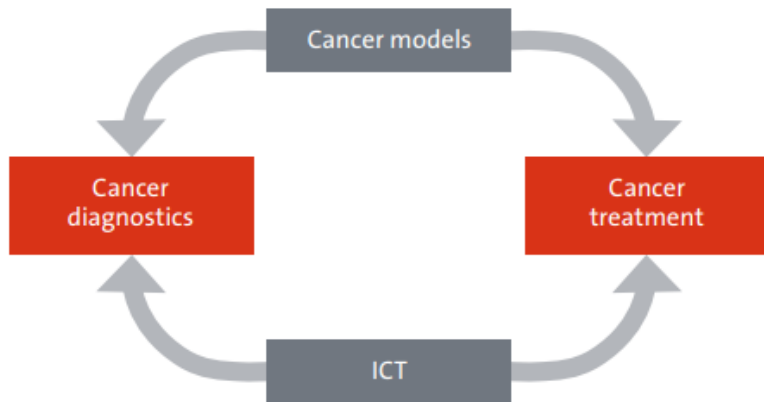
Several case studies

- Best practices in IP management and strategy

OVERVIEW CANCER TECHNOLOGIES

Figure 1

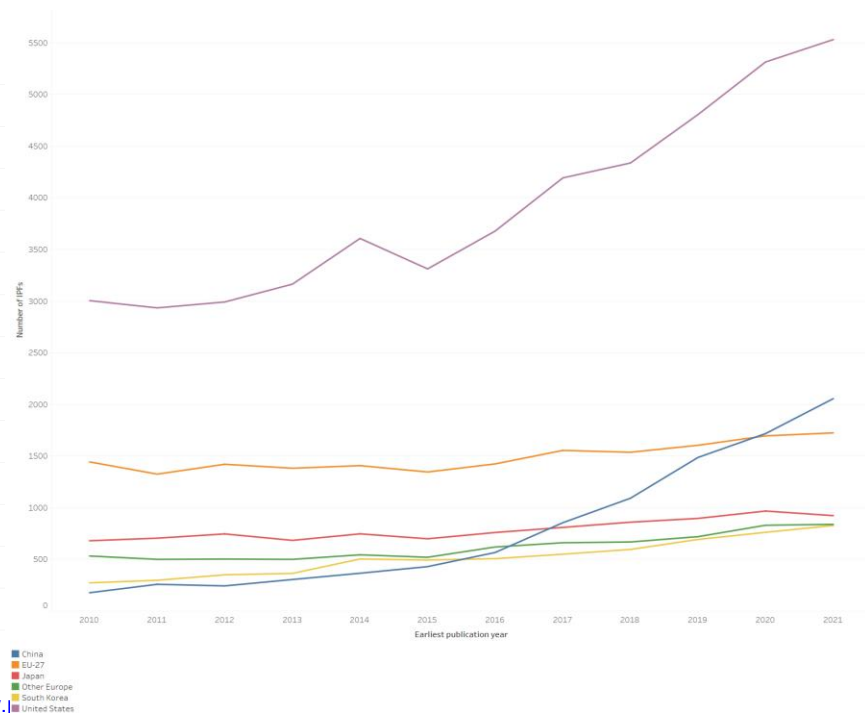
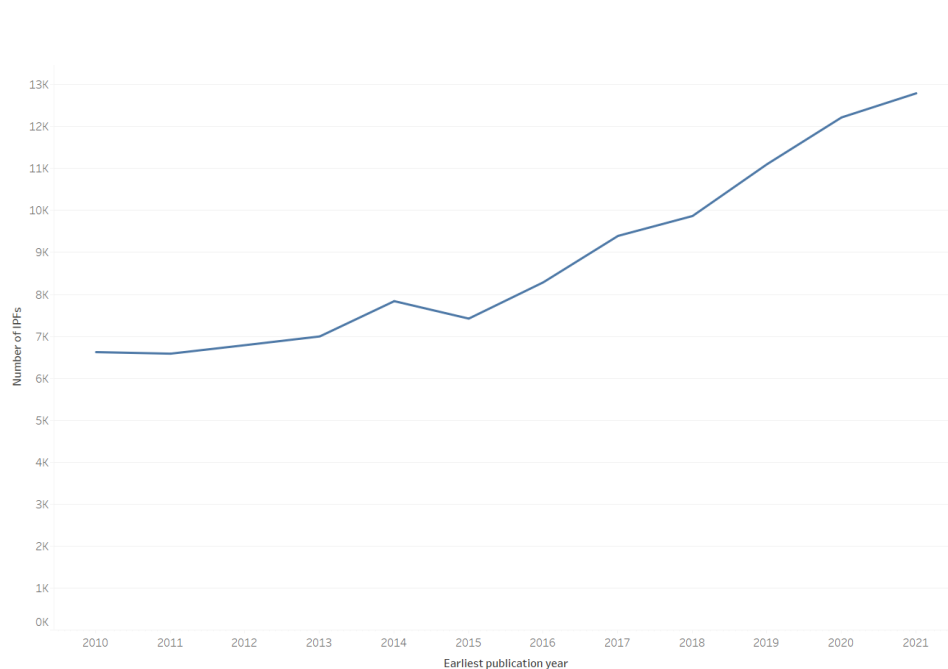
Overview of main cancer-related technology areas



Source: EPO

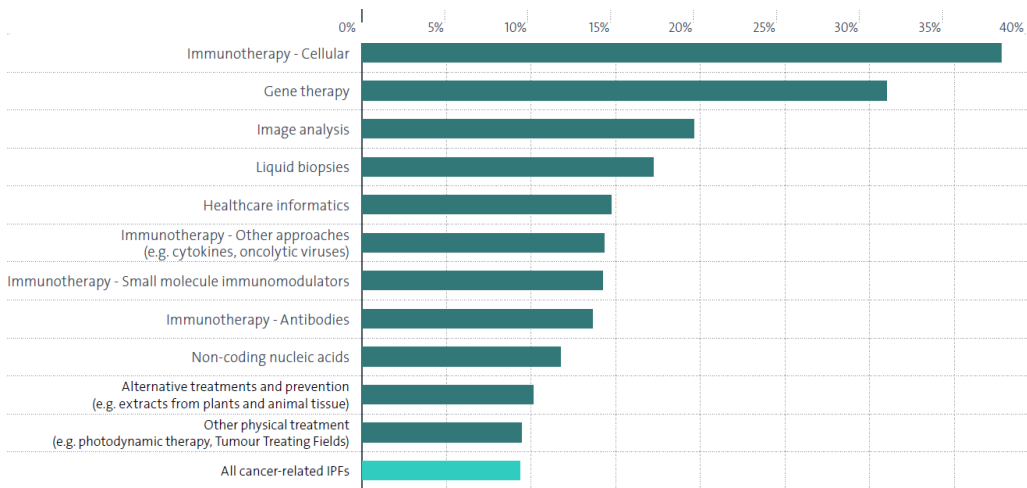
Source: <https://link.epo.org/web/publications/studies/en-epo-study-new-frontiers-in-oncology.pdf>

WHAT WE KNOW FROM THE FIRST STUDY



Source: <https://link.epo.org/web/publications/studies/en-epo-study-new-frontiers-in-oncology>

CANCER-RELATED TECHNOLOGIES – GROWTH DRIVERS



Source: <https://link.epo.org/web/publications/studies/en-epo-study-new-frontiers-in-oncology.pdf>

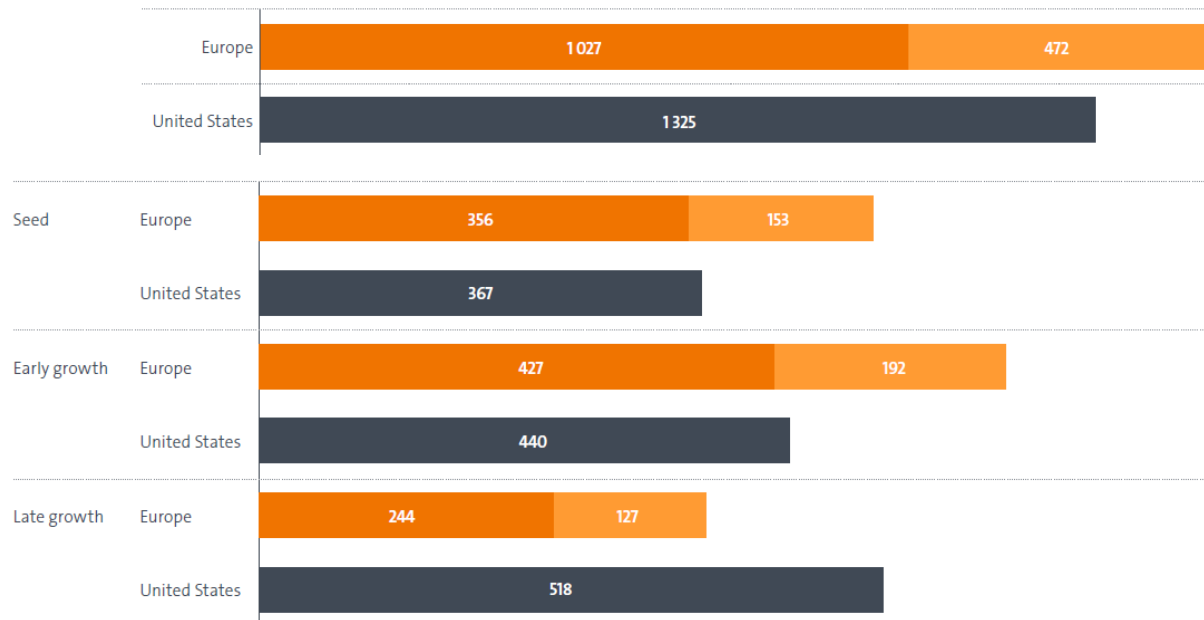
PERFORMANCE BY REGION IN HIGH-GROWTH TECHNOLOGY FIELDS— CHANGE IN SHARES 2010-15 VS 2016-21

	United States	EU27	Other Europe*	P.R. China	Japan	R. Korea
Alternative treatments and prevention (e.g. extracts from plants and animal tissue)	3.7%	-4.7%	-0.3%	4.8%	-0.8%	-0.7%
Immunotherapy - Other approaches (e.g. cytokines, oncolytic viruses)	3.6%	-4.4%	-3.5%	4.5%	0.1%	1.4%
Other physical treatment (e.g. photodynamic therapy, TTFs)	-7.4%	-5.1%	3.5%	9.5%	-0.6%	-1.1%
Gene therapy	3.7%	-5.9%	0.7%	6.4%	-1.0%	-1.1%
Non-coding nucleic acids	4.0%	-4.0%	-1.6%	7.3%	-1.7%	-2.6%
Healthcare informatics	3.3%	-4.0%	-0.5%	6.1%	-6.7%	-0.9%
Image analysis	-0.4%	-4.8%	0.2%	12.6%	-7.4%	-0.6%
Immunotherapy - Antibodies	1.4%	-5.4%	-3.6%	9.0%	-2.0%	0.7%
Immunotherapy - Cellular	-3.4%	-6.2%	1.6%	9.9%	-3.2%	0.5%
Immunotherapy - Small molecule immunomodulators	-2.6%	-4.5%	-1.1%	7.3%	-1.0%	1.0%
Liquid biopsies	0.1%	-5.5%	1.4%	3.7%	-0.8%	2.6%

While US and Chinese applicants expanded their patenting activity in high-growth cancer technologies, European applicants struggle to keep pace.

Source: <https://link.epo.org/web/publications/studies/en-epo-study-new-frontiers-in-oncology.pdf>

ROLE OF EUROPEAN STARTUPS – EUROPE VS USA



With nearly 1 500 entities, Europe hosts a larger number of cancer-related startups than the US...

... but fewer European startups successfully scale to late growth stages.

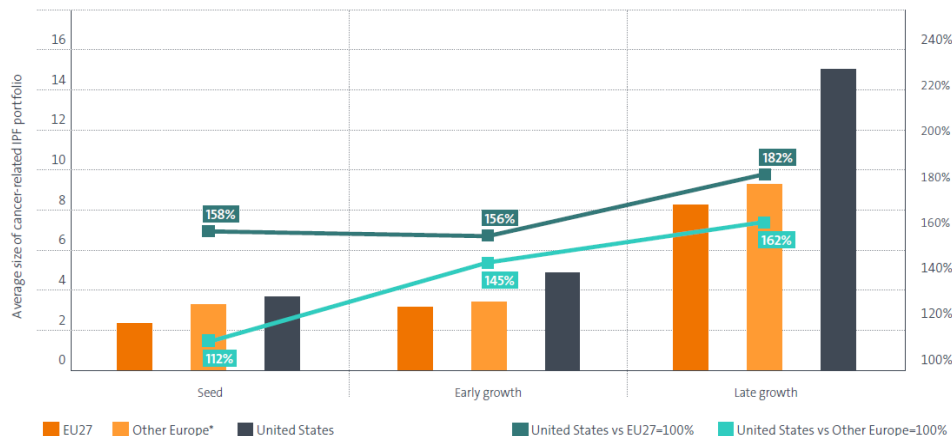
■ EU27 ■ Other Europe* ■ United States

* AL, CH, IS, LI, MC, ME, MK, NO, RS, SM, TR, UK

Source: <https://link.epo.org/web/publications/studies/en-epo-study-new-frontiers-in-oncology.pdf>

ROLE OF EUROPEAN STARTUPS – PATENT PORTFOLIO COMPARISON

Average size of cancer-related IPFs per startup by growth stage, 2010-2024



* AL, CH, IS, U, MC, ME, MK, NO, RS, SM, TR, UK

US startups hold significantly larger patent portfolios than their European counterparts across all growth stages

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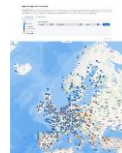
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DEEP TECH FINDER dtf.epo.org

Exploring deep technology in Europe • free digital tool

Over 13 000 startups and research institutions



68 tech fields

Localise startups in their **technological fields**



15 industry sectors

Combine **business** and **patent** information



Growth stage

Detect startups in their **development stage**



Funding

Identify **investors** in startups



European patents

Access to patent data on **Espacenet**

Recent releases



Self-registration form for startups, universities and PROs



Updated filters for **digital agriculture, quantum technologies and battery circularity**



Performance of European startups dashboard, in the Data Desk tool

Future releases



Addition of **EURO-PCT filings**

THREE ONCOLOGY CASE STUDIES

A new dimension to skin cancer diagnosis

Abstract

There have been many advances in the field of skin cancer diagnosis, but the need for a more accurate and reliable method remains. The invention described in this patent is a new method for skin cancer diagnosis, which is based on the use of a high-resolution optical coherence tomography (OCT) system. This system is capable of detecting the presence of skin cancer at an early stage, before it has spread to other parts of the body. The invention is a significant improvement over existing methods, as it is non-invasive and does not require the use of any harmful substances. The invention is a significant improvement over existing methods, as it is non-invasive and does not require the use of any harmful substances.

Figure 1 shows a cross-sectional view of a skin cancer diagnosis system. The system includes a light source, a beam splitter, a reference mirror, a sample mirror, and a detector. The light source emits a beam of light that is split into two paths. One path goes to the reference mirror, and the other path goes to the sample mirror. The light from the sample mirror is reflected back to the beam splitter, and then to the detector. The detector measures the intensity of the light, which is used to determine the presence of skin cancer.



Source: EP 3 600 000 A1, published 2019.09.12

Dame Medical (FR)

- Advanced medical imaging system
- Spin out from Institut d'Optique Graduate School
- Exclusive license and strong IP portfolio

Boosting the immune response to fight cancer

Abstract

The invention described in this patent is a new method for boosting the immune response to fight cancer. The method is based on the use of a vaccine that contains a specific antigen. The antigen is derived from a cancer cell, and it is designed to stimulate the immune system to attack the cancer cell. The invention is a significant improvement over existing methods, as it is more effective and does not require the use of any harmful substances. The invention is a significant improvement over existing methods, as it is more effective and does not require the use of any harmful substances.

Figure 1 shows a cross-sectional view of a cancer cell. The cell is shown in a cross-section, and it is labeled with various components. The components include the nucleus, the cytoplasm, and the cell membrane. The cell is shown in a cross-section, and it is labeled with various components. The components include the nucleus, the cytoplasm, and the cell membrane.



Source: EP 3 600 000 A1, published 2019.09.12

OncoQR (AT)

- Immunology vaccines
- Developed a patent protected technology platform
- Technology licensing

Smarter prognostic tests for early-stage breast cancer

Abstract

The invention described in this patent is a new method for predicting the outcome of early-stage breast cancer. The method is based on the use of a prognostic test that measures the expression of a specific gene. The gene is known to be involved in the progression of breast cancer, and its expression level is a good indicator of the outcome of the cancer. The invention is a significant improvement over existing methods, as it is more accurate and does not require the use of any harmful substances. The invention is a significant improvement over existing methods, as it is more accurate and does not require the use of any harmful substances.

Figure 1 shows a cross-sectional view of a breast cancer cell. The cell is shown in a cross-section, and it is labeled with various components. The components include the nucleus, the cytoplasm, and the cell membrane. The cell is shown in a cross-section, and it is labeled with various components. The components include the nucleus, the cytoplasm, and the cell membrane.



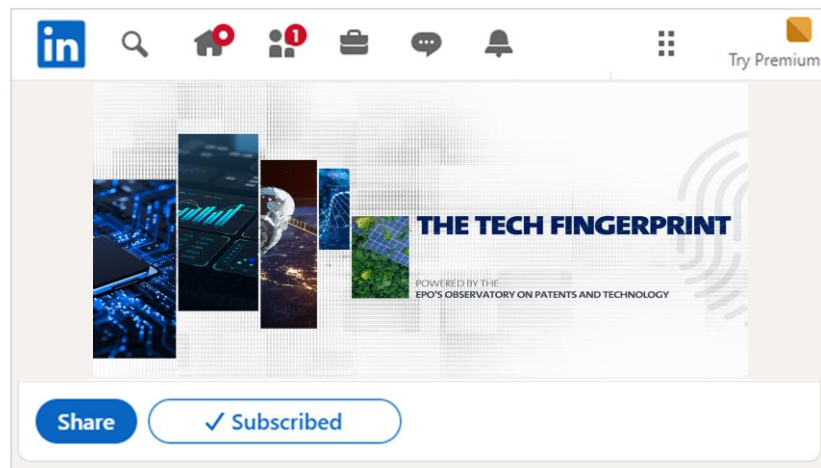
Source: EP 3 600 000 A1, published 2019.09.12

OncoMark (IE)

- Biomarkers for better diagnosis and prognosis
- University spinoff
- Company successfully acquired

A NEW CHANNEL TO STAY UP TO DATE

This year we have started launching monthly releases of our [LinkedIn newsletter](#), join us!



Edition on combatting cancer!



Ilja Rudyk

Senior Economist, EPO



observatory@epo.org



epo.org/observatory
Digital Library and DTF tools



[LinkedIn Observatory newsletter](#)



PATENTABILITY ISSUES IN FOCUS ON MEDICAL TECHNOLOGY AND ONCOLOGY

SHIRI BUREMA (OWNER) | EXAMINER TEAM TARGETED DRUGS & CHAIR + 1ST MEMBER OPPOSITION DIRECTORATE HEALTH | 15.07.26 | VERSION 1

Security classification: Public

epo.org

“

**IS A STRONG INVENTION
AUTOMATICALLY
A STRONG PATENT?**



“

GOOD SCIENCE **CAN FAIL** DURING THE
PATENTING PROCESS BECAUSE OF
AVOIDABLE MISTAKES

The science can be **excellent**.

The commercial value can be **enormous**.

Yet patent protection depends on what is **written and filed
as a patent application** at the very beginning.

Patent office examines **application as filed** – not the inventor's intention

“

A **STRONG** PATENT

IS

A **WELL-WRITTEN** PATENT

Take-home message #1



“

HOW MANY PROMISING DRUG CANDIDATES
HAVE LOST PROTECTION BECAUSE THE
APPLICATION DID NOT CONTAIN THE RIGHT
INFORMATION AT FILLING?

DISCLAIMERS

EPO perspective taken

- Other patent offices may differ, especially US(PTO)
 - Patent attorney can advise (with help of agents)

DISCLAIMERS

Goal of this presentation

- Highlight common “mistakes” from an examiner perspective and during search & examination
 - No deep-dive: detailed discussion in Q&A as desired
 - Patent aspects not dealt with by EPO not discussed (ownership, inventorship, licensing etc.)
 - Opposition not discussed (except lessons from O which apply to S & E)
- Your strategy may be different (!)
 - Patent attorney can advise

PATENTABILITY ISSUE #1 : PUBLISHING BEFORE FILING

SOUNDS LOGICAL, RIGHT?

Think about the “small things”

- Preprints / early conference abstracts
- Theses (students/interns?)
- YouTube videos / recorded conferences
- And yes, we do check social media

No grace period in Europe

- Unless “no earlier than 6 months before filing”
- “evident abuse” or display at “special” international exhibition (Article 55 EPC)

“

FILE FIRST



PUBLISH SECOND

Take-home message #2



PATENTABILITY ISSUE #2 : PRIORITY PAPERWORK GONE WRONG

THE **CRISPR-CAS9** PATENT WAS REVOKED BY EPO DUE TO THIS

Priority allows a later application to rely on the filing date of an earlier application, protecting it from intervening prior art (Article 87 EPC), a.o.

- Maximum 12 months between earlier and later application
- Must be same applicant(s) (or successor(s) in title).

Usually:

- Between parties: Transfer or abandonment of **priority** rights gone wrong
- Filing later application omitting applicants
- Filing later application in different name/names
 - US inventor composition

“

PRIORITY IS NOT AUTOMATIC. DEFECTIVE
PRIORITY MAY EXPOSE YOUR INVENTION TO
YOUR OWN FIELD'S RAPID PUBLICATIONS

Take-home message #3

PATENTABILITY ISSUE #3 : NO DATA OR LIMITED DATA

IS IT FAIR TO GET PATENT PROTECTION?

What is
claimed

What examples
show

Assessment: skilled person
(CGK + AAF)

What is
claimed

- Article 84 EPC
(no support)
- Article 83 EPC
(insufficiency of disclosure)
- Article 56 EPC
(no effect over full scope)

What is
claimed

What examples show

“

CLAIM AS **BROADLY** AS YOUR
DATA **SUPPORTS**
(WITHOUT UNDULY LIMITING YOURSELF)

Take-home message **#4**

WYETH V. ASTRAZENECA – WHEN CLAIM SCOPE EXCEEDS DATA

Recent US appeal court decision (9 July 2026)

- **Wyeth**: owns patents US 10,603,314 and US 10,596,162
- Sues **AstraZeneca**: their **Tagrisso (Osimertinib)** (non-small cell lung cancer) would infringe
- **US appeal court**: Wyeth's patents **revoked, no infringement** by AstraZeneca.
- Wyeth's patents:
 - **claimed** daily therapeutic dosages for patients
 - provided **no actual dosing examples**
 - So: the data does not support the claims

PATENTABILITY ISSUE #4 : POOR DATA FOR PATENT PURPOSES

Examiners do not read examples like a scientific article: **they constantly project it on the EPC**

Examiners extract lots of **“does it meet the EPC info”** from examples

Helpful to include is:

- Comparative examples (vs closest prior art known to you)
 - **Do not only say** : “Compound A works”
 - **Say**: “Compound A works better than known compounds B and C.”
- Unexpected advantages
- Improvements (w.r.t. any parameter: toxicity, stability, selectivity, dose-response, etc)
- In case of synergy of A & B:
 - show that A and B together works better than the sum of individual A and individual B
- Take care: what you claim must be demonstrated (e.g. dosage in case of Wyeth)
- For therapeutic claims: proof of claimed therapeutic effect is a **MUST**

BEWARE

- Adding experimental data to the patent application, once filed, is not possible
- Evidence for an effect can be filed separately later in the procedure, but:
 - Only taken into account if skilled person (CGK + AAF) would derive the effect as being encompassed by the technical teaching of the patent application (G 2/21)
- Do not include data which may give the impression that it contradicts the invention (it is not a scientific publication)

BE HAPPY

- No need for perfection or “scientific article-level” of proof
- *In vitro* data is fine. Some evidence for the principle is enough.
 - Unless you explicitly claim something that cannot be shown *in vitro* (e.g. dosages in humans) (think of Wyeth)

“

A PATENT IS NOT A SCIENTIFIC
PUBLICATION: EXPERIMENTS HAVE
DIFFERENT GOALS

Take-home message #5

PATENTABILITY ISSUE #5 : OBSCURING THE CRUX OF THE INVENTION

Crux of the invention: the core technical idea that makes the invention work (note: no EPC term)

To identify by asking: what can I take away and the invention will still work?

- E.g. **invention is:** a new EGFR inhibitor where side-group X interacts crucially in the binding pocket of the EGF receptor.
- **Crux is:** sidegroup X.

Ideally: claims identify the crux well; rest of the embodiment can have more variation.

- E.g.: Subgroup X is defined well; rest of the compound can have more variation within reason (e.g. no biologically harmful subgroups, no huge increase in size of the compound etc.)

Obscuring the crux of the invention:

- Using “result-to-be-achieved formulations” for the crux (*desiderata*) (“free beer claim”).
 - Desired effect defined, not the technical means to obtain it.
 - “A compound capable of treating autoimmune disease”
- Functional formulations for the crux
 - Defining an element of the invention by what it does (function) instead of its structure
 - “A compound capable of inhibiting JAK2 kinase”

Obscuring the crux of the invention:

- Desired concept not reflected in dependent claims
- A single claim spanning 10+ pages
- Enormous amount of not-very-related alternatives in a single claim
- Trying to cover more than 1 inventive concept in the claims (non-unity objection)(Article 82 EPC)
- Filing clearly not novel claims which take aboard lots of commonly known prior art

“

IDENTIFY THE CRUX OF THE INVENTION
AND ALWAYS KEEP IT IN FOCUS

Take-home message #6

PATENTABILITY ISSUE #6 : POOR FALLBACK POSITIONS

You may need to amend the claims, make your life easy:

- EPO very strict on using literal wording from description / basis in priority document not allowed

Good to include

- Definitions of terms, especially functional terms
- Lists of specific compounds, especially if classes of compounds used (length: be reasonable)
- If claiming mechanism of action (“condition to be improved by occupying receptor X”) or “disease associated with marker Y”:
 - include concrete diseases as a fallback; or
 - include instructions (experimental tests or testable criteria) allowing to recognise which conditions fall within the functional definition

Good to include

- If claiming a use which can be both therapeutic and non-therapeutic:
 - Separate and distinguish between therapy and non-therapy embodiments
 - Add explicit basis for “*ex-vivo*” and/or “*in vitro*”
- Various ranges for a variable, but be reasonable
- Measurement methods / conditions of variables, if these give different outcomes (e.g. viscosity)
- If using terms like “about”, “substantial”: include error margins (dosage is 10 mg $\pm$ 1%)
- No relative terms “small”, “strong”: quantify
- Short sentences in the description that can be copy-pasted as such in the claims.
Preferably no redundant information, no subordinate clauses.

Focus especially on:

- Fallback positions for the crux of the invention
- Covering alternative embodiments

“If I were the competitor and would read this patent, what would I tweak to not infringe?”

- Analogues and derivatives (but don't use these words in the claims; be specific)
- Salts
- Formulations
- Combinations
- Dosing regimens
- Biomarkers
- Patient populations

“

YOU CAN ADD ARGUMENTS LATER, BUT
YOU CANNOT ADD NEW TECHNICAL
INFORMATION

Take-home message #7

PATENTABILITY ISSUE #7 : GETTING THE PHARMA SPECIFICS RIGHT

- Article 53(c) EPC: methods of **diagnosis or treating** human or animal body by **therapy or surgery** are not patentable.
- Article 54(4)(5) EPC: allow obtaining protection through:
“substance X for use in treating/diagnosing/surgery of Y”
 - **Note:** as long as effect comes from substance (chemical) and not device (physical)
 - **Note:** diagnosis is only diagnosis when a diagnostic step is present
- **Pay attention** with:
 - A use which can include both therapeutic and non–therapeutic uses
 - Defining a use through a mechanism of action
 - Including proof of the claimed therapeutic effect

- Article 53(c) EPC: methods of **diagnosis or treating** human or animal body by **therapy or surgery** are not patentable.
- **What many don't know:** a pure method of imaging is patentable (“method of imaging a tumour”), but:
 - **No** diagnostic / therapy / surgery step
 - **Otherwise:** reformulate to medical use format (**Article 54(5) EPC**)
 - **No** explicit invasive administration step (explicit non-invasive administration step is allowed!)
 - **Otherwise:** reformulate to medical use format (**Article 54(5) EPC**)
 - Or: make administration passive (“where X **has been** administered”)

“

PHARMACEUTICAL PATENTING HAS ITS
OWN RULEBOOK. KNOWING IT HELPS
YOU AVOID COSTLY MISTAKES

Take-home message #8

PATENTABILITY ISSUE #8 : HIRING THE WRONG ATTORNEY

- I can and will not comment on the quality of attorneys – it is anyhow “case by case”.
- I just want you to think critically before you hire somebody
- Weigh out: cost / patent experience (years & type of experience) / technical knowledge.
- The only take-away message is:
 - Broadly, there are 4 different domains where drafting styles and case law differ:
 - chemistry / pharma / mechanics / electronics
 - At least hire a patent attorney with an expertise in the domain corresponding to your invention

“

A GREAT INVENTION DESERVES A PATENT
ATTORNEY WHO CAN RECOGNIZE,
CAPTURE AND PROTECT ITS TRUE VALUE

Take-home message #9

PATENTABILITY ISSUE #9 : “ANNOYING” THE EXAMINER

- **Behaviour:** filing 100+ claims, alternatives or extremely broad Markush formulas
 - **Ideal:** Identify valuable protection (“the crux”) early

- **Behaviour:** maintaining an unrealistic position (after multiple iterations)
 - **Ideal:** use examiner feedback strategically and/or call the examiner to clarify

- **Behaviour:** non-arguments (e.g. “it is novel, not explicitly suggested, therefore it is inventive”)
 - **Ideal:** complete arguments that we can adopt to write our votum

- **Behaviour:** lots of fluff, irrelevant to the EPC
 - **Ideal:** clean, “to the point”, EPC-directed reasoning

- **Behaviour:** lots of amendments, no indicated basis
 - **Ideal:** precise analysis of amendments and support in AAF

- **Behaviour:** making clearly untrue statements about disclosures of documents or basis in the AAF
 - **Ideal:** be honest, open and transparent. Some interpretation is allowed.

- **Behaviour:** calling the examiner at search stage (e.g. for tips) (no legal right – is a courtesy)
 - **Ideal:** leave telephone conversations for examination

- **Behaviour:** disrespectful tone (very rare)
 - **Ideal:** stay respectful, even if you disagree

“

IT IS NOT “US AGAINST THE EXAMINER”
EXAMINERS ARE COOPERATIVE

Take-home message #10

TO SUM UP:

- File before you publish.
- Protect your priority
- Claim what your data supports.
- And generate data needed to support what you claim
- Clearly convey the crux of the invention
- Build clever fallback positions
- Know the pharma rulebook
- Match your choice of patent attorney to your needs
- Keep the examiner on your side: it's a dialogue, not a battle

“

THANK YOU FOR LISTENING -
WISHING YOU STRONG DATA, SUPPORTED
CLAIMS AND ROBUST PATENTS

Q&A session will take place at 11.15h – see you there



Protect your IP – A case study from the EIC Pathfinder project PERSEUS

Giancarlo Salviati, Project Coordinator

Nicoletta Marigo, Project Manager



**Funded by
the European Union**

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101099423 – PERSEUS. UK participants are supported by UKRI grant number 10073017

PERSEUS EOP Meeting, July 15th, 2026



The consortium



National Research Council 

Karolinska Institutet 

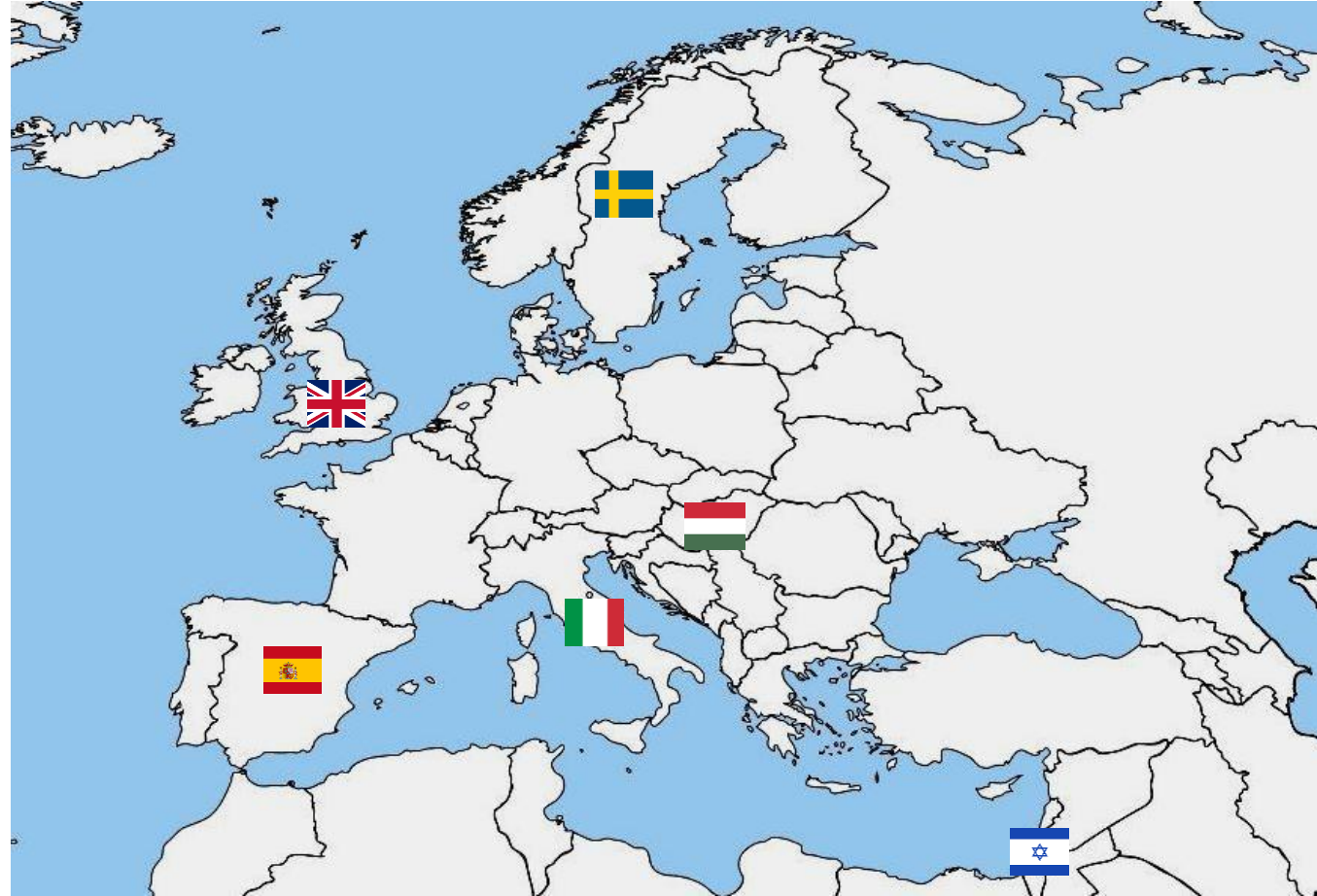
Technion – Israel Institute of Technology 

Universidad de Vigo 

Wigner Fizikai Kutatóközpont 

BeDimensional 

QED Film & Stage Productions Ltd 



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Perseus EOP Meeting, July 15th, 2026



Outline

- PERSEUS purpose and idea
- Main outcomes
- IP strategy development





PERSEUS purpose



Developing a new cancer treatment using a novel nanotechnology to boost the radiotherapeutic efficacy of low-dose/low energy X-rays to target and destroy metastatic solid tumors



Developing a protocol irrespective of the cancer cell nature, i.e. the therapy is agnostic to the type of solid cancer and to gender incidence.

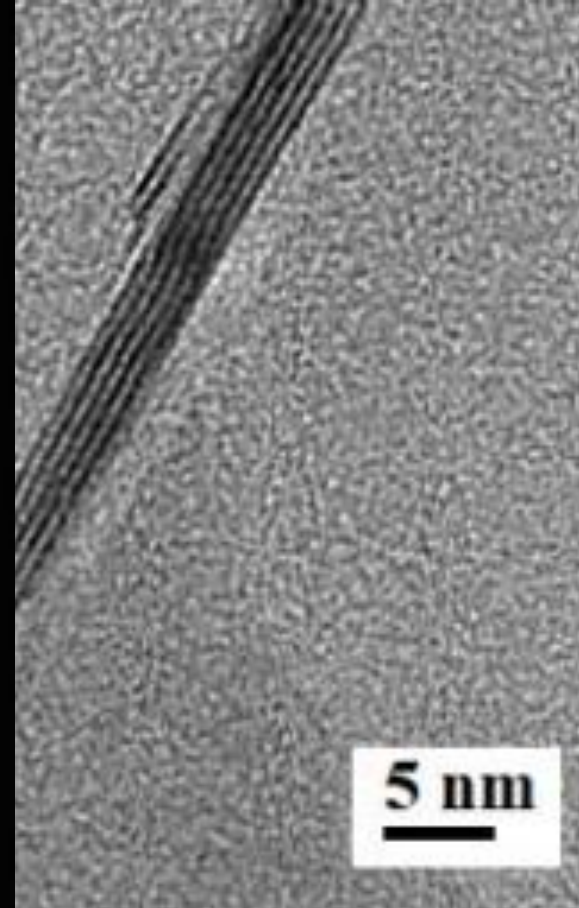
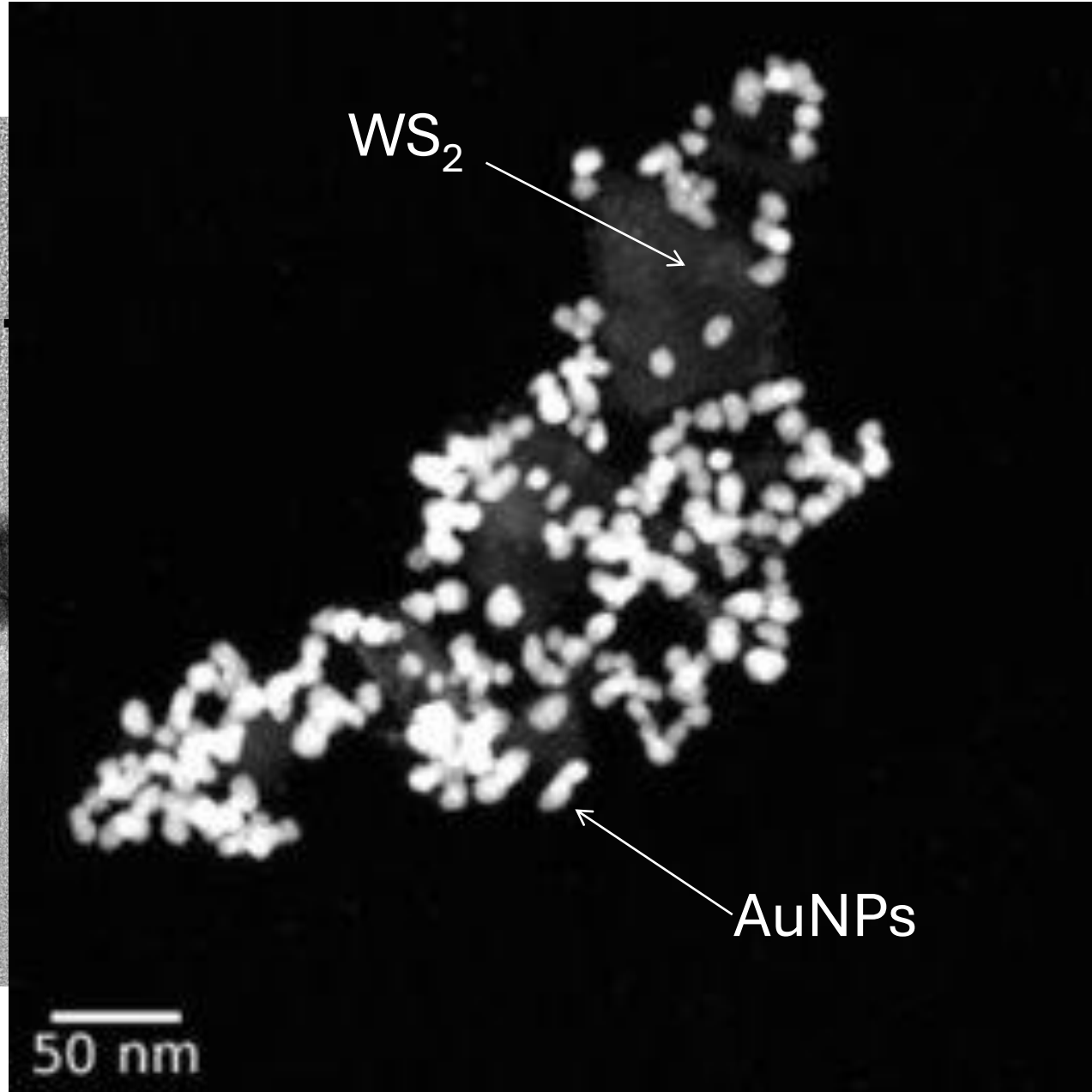
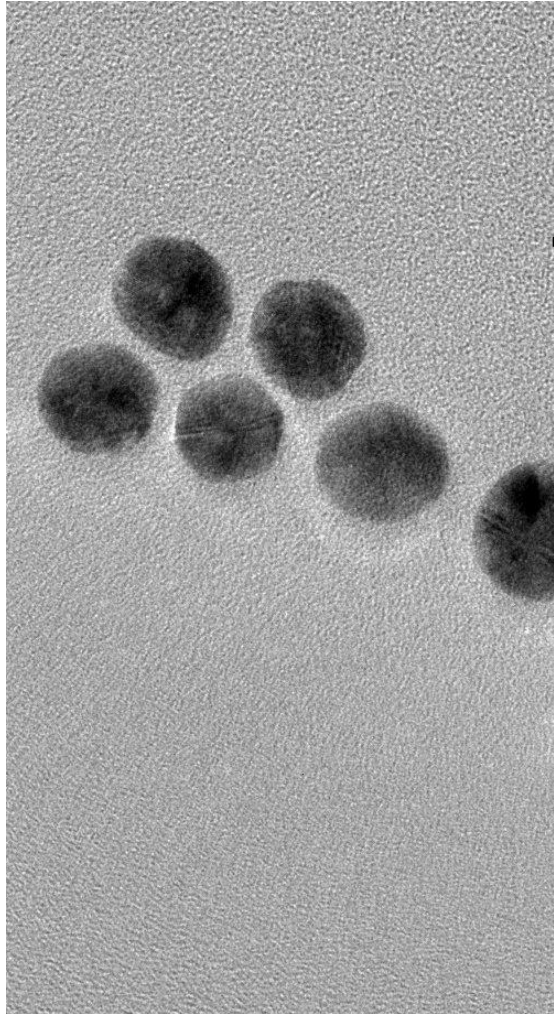


Reducing the harmful side effects of traditional HV radiation therapy while improving outcomes for patients with the most difficult-to-treat cancers.





The nanosystem





How to achieve the purpose

Tumor targeting

The bare NSs or internalized in synthetic cells (NS + SC = NV) and administered intraperitoneally, intratumorally or intravenously through the bloodstream, to reach tumors via passive or active targeting.

X-ray irradiation of NV

The NV opens and the NSs gets internalized by the cancer cells. There the NSs deliver localized therapies with a spatial decay of the order of tens/hundreds of nm sparing surrounding healthy tissue.

Eliciting Immunotherapy

The NVs cause immunogenic cell death due to tumor-specific neo-antigens triggering an immune response against the tumor, thereby harnessing the body's own immune system as cancer therapy.

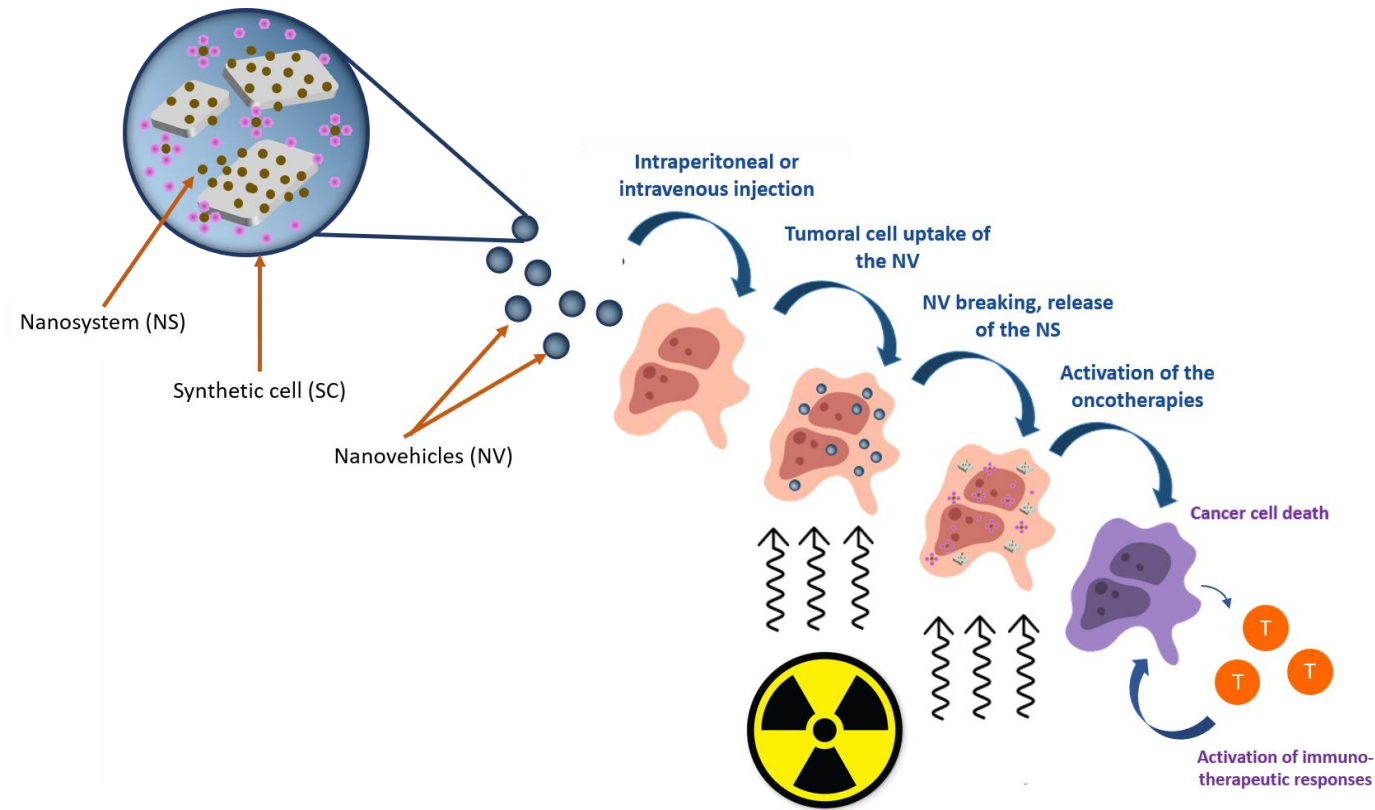


Figure 1. Schematic showing the working principle of PERSEUS

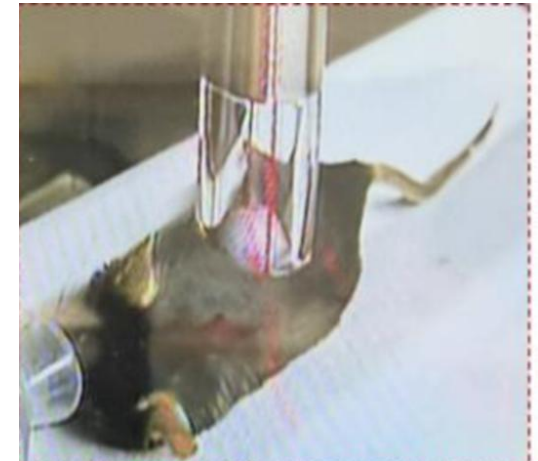
Lewis Lung Carcinoma (LLC) model

Established a primary tumor-metastasis **Lewis Lung Carcinoma (LLC)** model.

Demonstrated a **reduction in primary tumor size** in the combined irradiation + nanosystem group compared to irradiation alone (**1–3 Gy**) in subcutaneous models.

Reported a **reduced metastatic burden in distant organs**, particularly liver and lung, across complementary models

Demonstrated elevating macrophages activation





Interdisciplinarity and IP

- **PERSEUS's underlying concept is rooted** in the integration of principles from **Physics, Chemistry, and Materials Science** for the development of an innovative oncotherapeutic platform.
- **For a successful proof of concept, Medicine, Biology, and Biotechnology contributions** for *in vivo* validation and tumour model development are equally critical.





Interdisciplinarity and IP

- **Complex IP strategy** due to the highly multidisciplinary nature of PERSEUS.
- **Multiple technological domains**, each with distinct innovations, background IP, and patent constraints.
- **Comprehensive assessment** required to identify the most effective IP protection strategy.





Interdisciplinarity and IP

- Highly multidisciplinary project, **increasing the likelihood of encountering existing patents and prior IP across different technological domains.**
- **Broad patent protection of the overall concept may not be feasible** because some technological components may already be covered by prior art.
- **IP strategy should focus on protecting novel enabling innovations and patentable technological components.**
- **Comprehensive Freedom-to-Operate (FTO) and patent landscape analyses** are essential to define the optimal IP protection strategy.





How PERSEUS managed IP & exploitation: the roadmap

Identify KERs

Map
background IP

Define
ownership &
access rights

Assess
protection
options

Develop
exploitation
strategy

Evaluate
market
opportunities

Monitoring and evaluation

**IP management was approached from the
beginning of the project as a structured process
not as a single patenting exercise**



What we actually implemented: the actions

Identification of results

- Defined + periodically reviewed **KERs**
- Assessed **protection routes** for each KER

Understanding ownership

- Analysed **background** and **foreground IP**
- Reviewed ownership, **access rights** and joint ownership issues

Planning for exploitation

- Identification of **stakeholders** and **end-users**
- **Freedom-to-Operate** (FTO) analysis
- Development of exploitation pathways
- **Market** and risk analysis

Evaluating protection options

- **Patentability** assessment
- Identification of **alternative protection tools** (copyright, know-how, trade secrets, ...)

Protecting a result is only one step; understanding ownership and planning exploitation are equally important



How we strengthened our IP capacity

- Participation in **EU IP Helpdesk seminars and webinars**
- Regular discussions on IP protection and exploitation within the consortium (includes **two exploitation workshops organized by the consortium**)
- **Partners IP offices** and technology transfer experts
- **External Advisory Board** guidance on exploitation opportunities
- **EIC Booster Services**

Training & awareness

Expert support

Researchers cannot manage innovation alone: successful exploitation requires training, collaboration with IP experts, technology transfer professionals and external advisors





Lesson 1: don't assume your invention is novel

What happened

- During the patentability assessment (performed in the 2nd year of the project), it emerged that a patent very similar to one of the project's KER already existed in China. This significantly limited patentability opportunities for the PERSEUS result due to prior art and lack of novelty.

Good practice

- ✓ **Perform patent searches** as early as possible
- ✓ **Consult the IP offices** and technology-transfer services of project partners as early as possible
- ✓ Regularly **monitor the patent landscape**

Avoid

- ✓ Assuming that a scientific idea is novel because it has not been published in academic literature
- ✓ Focusing only on scientific publications and ignoring patent databases.
- ✓ Waiting until the project is well under way to investigate prior art

A patent search performed early can save considerable time and effort and help redirect exploitation strategies before opportunities are lost





Lesson 2: manage IP before you disseminate

What happened

- The patentability assessment showed that some project results could no longer be patented because technical information had already been disclosed through posters, presentations and other public communications (e.g: project overview in CORDIS)

Good practice

- ✓ **Assess patentability early**
- ✓ Review **publications** and conference materials **before release to assess IP relevance**
- ✓ Mark **deliverables as SEN**

Avoid

- ✓ Writing sensible information on the EU portal + project website
- ✓ Publishing documents in Cordis (e.g. making deliverables publicly available)
- ✓ Assuming that conference posters or presentations are harmless for IP disclosure
- ✓ Making Master and/or PhD thesis publicly available

Dissemination and IP protection must be planned together from the beginning





Lesson 3: when patents are not available, think beyond patents

What happened

- Although the main KER could not be patented, PERSEUS retained valuable know-how, software and expertise, and the Freedom-to-Operate analysis confirmed opportunities for further exploitation in Europe.

Good practice

- ✓ Consider **alternative IP tools** (Copyright, Trade secrets, Know-how protection)
- ✓ Document internal protocols + valuable know-how
- ✓ Explore **alternative exploitation pathways** (academic leadership, service contracts, spin-off opportunities)

Avoid

- ✓ Assuming that "not patentable" means "not exploitable"
- ✓ Focusing exclusively on patents when defining an exploitation strategy

Innovation can create value even when patent protection is not available





Lesson 4: balance open science and confidentiality

What happened

- Horizon Europe promotes openness, but also allows confidential treatment of information when needed for protection and exploitation purposes

Good practice

- ✓ Identify what can be shared and what should remain confidential
- ✓ **Protect valuable know-how before disclosure** (includes open repositories, e.g: Zenodo, arXiv, bioRxiv, MedRxiv)
- ✓ **Use NDAs** and confidentiality measures when appropriate

Avoid

- ✓ Releasing sensitive technical information without an IP review
- ✓ Treating Open Science as an obligation to disclose everything

Openness and protection are not opposites, they must be balanced strategically





The strategic role of non-scientific WPs

WP1

- Effective project coordination, management & decision making
- **Open science**, open access: publications & data set (Zenodo)
- Efficient data sharing & traceability
- **Organization of International Workshops**
- Proactive risk management

WP5

- ✓ Visual Identity and online presence
- ✓ Digital strategy and accessibility
- ✓ **Scientific dissemination and compliance**
- ✓ Community engagement and events
- ✓ **Clustering and exploitation support**

WP6

- ☐ **Exploitation and innovation management**
- ☐ **Identification of key exploitable results**
- ☐ Organization of an Exploitation Workshops
- ☐ **Participation in the EU Booster services**



Funded by
the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101099423 – PERSEUS. UK participants are supported by UKRI grant number 10073017



Take away messages

01.

Think about IP from day one



Protectability should be assessed before dissemination

02.

Know your innovation landscape



Early patent and prior-art searches can prevent surprises later

03.

Patents are only one tool



Know-how, copyright, trade secrets and licensing can also create value

04.

Clarify ownership early



Address from the start background IP, access rights and joint ownership

05.

Balance openness and protection



Open science and IP protection can coexist when managed strategically





General warning

- **Understand the specific objectives of your Horizon programme.**

An ERC focuses primarily on scientific excellence, whereas an EIC Pathfinder also requires a strong strategy for IP, innovation, and future exploitation.

- **Do not see your project as just scientific research.**

Treat it as a complete innovation project in which science is only one part of the overall success.

- **Think beyond science and consider IP from a broad perspective.**

It affects not only patent protection but also potential applications, regulatory pathways, market opportunities, and the competitive landscape. Explore these aspects as early as possible.

- **Be visionary from the start.**

Even if your project is still at the blue-sky research stage and lacks experimental proof of concept, begin thinking about IP protection and exploitation from day one





But overall ... be sure to have a good Project Manager



Nicoletta Marigo PhD
PERSEUS Project manager

Ensure continuous day-to-day monitoring of the project through regular feedback and close interaction with the Project Coordinator (PC) and all Consortium members.

Foster and strengthen human connections across different cultures, scientific disciplines, and regulatory environments, promoting trust, collaboration, and effective communication.



LEARNING RESOURCES

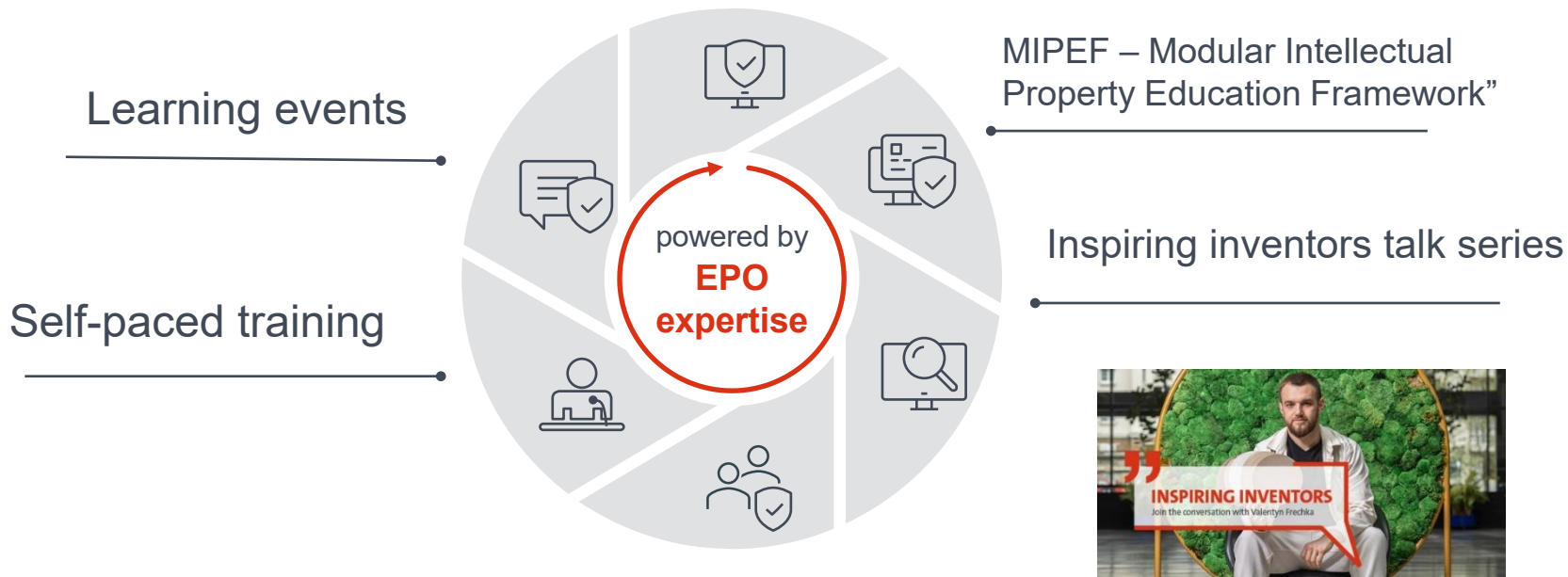
JÜRGEN MÜHL, EUROPEAN PATENT ACADEMY, 20 MARCH 2026

THE EUROPEAN PATENT ACADEMY <https://www.epo.org/en/learning>

- Patent-related education opportunities to stakeholders in Europe and beyond.
- Wide range of audiences: examiners and national patent office staff, patent attorneys and professionals, inventors, businesses, universities, technology transfer centres and anyone interested in patent-related topics
- Areas covered: patent granting, patent information, technology transfer and patent litigation and enforcement.
- Self-paced training courses and learning events.

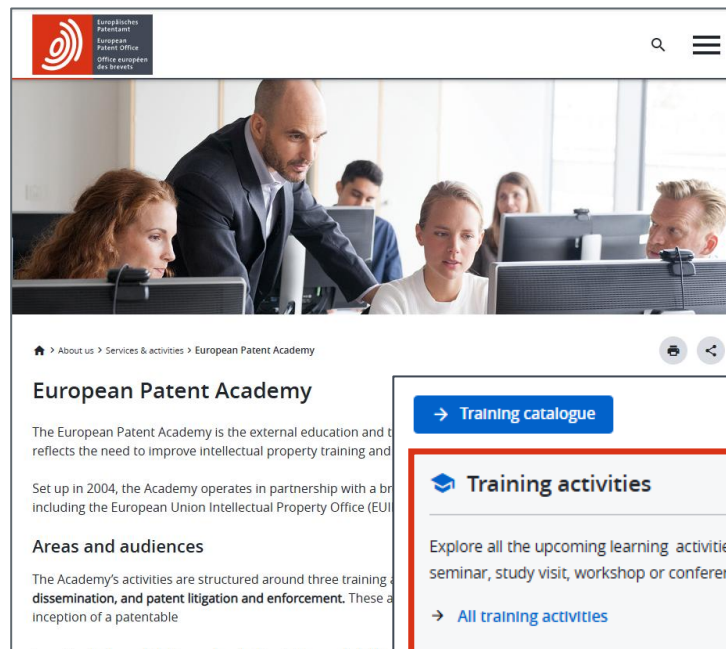
OUR OFFER

Supporting IP awareness and promoting IP education



LEARNING EVENTS – SEARCHING FOR UPCOMING SESSIONS

<https://www.epo.org/en/learning>



The screenshot shows the top of the European Patent Academy website. It features the EPO logo in the top left corner, a search bar, and a menu icon in the top right. Below the header is a large image of a group of people in a meeting. Underneath the image is a breadcrumb trail: "Home > About us > Services & activities > European Patent Academy". The main heading is "European Patent Academy". Below this is a paragraph: "The European Patent Academy is the external education and training body of the EPO, reflecting the need to improve intellectual property training and knowledge." Another paragraph follows: "Set up in 2004, the Academy operates in partnership with a number of external partners, including the European Union Intellectual Property Office (EUIPO)." The section "Areas and audiences" is partially visible, starting with "The Academy's activities are structured around three training areas: dissemination, and patent litigation and enforcement. These activities are designed for the conception of a patentable".

→ Training catalogue

Training activities

Explore all the upcoming learning activities and join us soon for a course, lecture, seminar, study visit, workshop or conference.

→ [All training activities](#)

e-Learning centre

Delve deeper into the world of intellectual property (IP) by signing up for our e-learning centre and access a wide range of training activities and learning resources at different levels to deepen your knowledge of IP.

→ [e-Learning centre](#)

LEARNING EVENTS – SEARCHING FOR UPCOMING SESSIONS

Filter options 2

Start Date

From

01-07-2026

to

30-09-2026

Language

☐ English 19

Fee

☒ All
☐ Free
☐ Paid

Format

☐ Online 18
☐ Onsite 1

Target audience

☒ Business and IP managers 7
☐ National Offices and IP authorities 4
☐ Patent attorneys and paralegals 3
☐ Judges, lawyers and prosecutors 3
☒ Universities, research centres and technology transfer centres 1
☐ Other 1

Available languages

☐ English 2

Training area

☐ Technology transfer and dissemination 7
☐ Patent granting 1

Location

+

Activity type

☒ Seminar 3
☒ Lecture 3
☒ Course 1
☒ Open course 1



1 - 9 of 9 search results



E-Learning Courses/Events
Examination: Communication with the end in mind
 € Free 18h
 The aim of this workshop is to allow participants to develop their communication skills in the context of the examination procedure. Participants e...
 Learning



E-Learning Courses/Events
Expert workshop for national judges and the Boards of Appeal on patentability issues
 € Free 6h
 This expert workshop brings together an equal number of expert patent judges and members of the EPO Boards of Appeal to discuss and exchange ...
 Learning

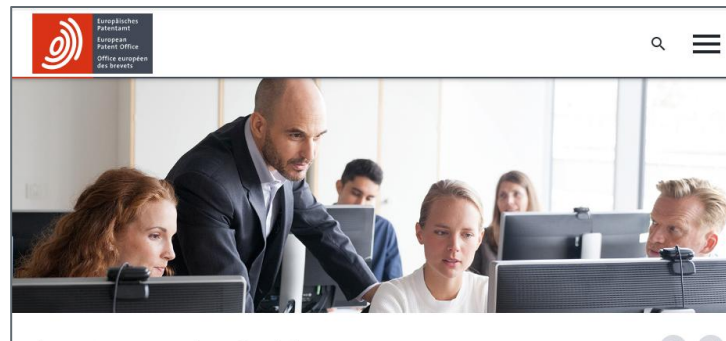


E-Learning Courses/Events
Digital innovations
 € Free 2h
 As AI moves from the laboratory into operating theatres, factories and cockpits, competitive advantage increasingly hinges on a critical moment: wh...
 Learning



E-Learning Courses/Events
Business use of patent information
 € Free 7h
 Patent analytics enable businesses to monitor the competitive environment. This seminar shows why patent information matters and how to engage sear...
 Learning

ON-LINE LEARNING RESOURCES: SELF-PACED TRAINING



🏠 > About us > Services & activities > European Patent Academy

European Patent Academy

The European Patent Academy is the external education and training centre of the EPO, reflecting the need to improve intellectual property training and awareness.

Set up in 2004, the Academy operates in partnership with a number of partner organisations, including the European Union Intellectual Property Office (EUIPO).

Areas and audiences

The Academy's activities are structured around three training areas: **dissemination, and patent litigation and enforcement**. These activities are aimed at the **inception of a patentable** idea.

→ [Training catalogue](#)

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Explore all the upcoming learning activities and join us soon for a course, lecture, seminar, study visit, workshop or conference.

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→ [e-Learning centre](#)

ON-LINE LEARNING RESOURCES: SELF-PACED TRAINING



Patent granting
Why and how to apply for and obtain a European patent

→ See Courses



Patent tools and analytics
How to search, analyse and use patent data to support innovation

→ See Courses



Patent litigation
How to defend or fight against existing patents

→ See Courses



Technology transfer and IP dissemination
How to turn research into innovation and bring IP to market

→ See Courses

EQE and EPAC

How the EPO can help you preparing for the examination

→ See Courses



IP Assessment: How to improve informed decision-making | BS20-2026

This training focuses on the IP-related challenges and issues that arise during systematic assessment of technologies and patents. It offers effective strategies and introduces the tool, IPscore, that you can use to evaluate your research projects and innovations. It will give you a clearer picture of their commercialization potential and support strategic decision-making by helping you set priorities that save time and resources. The program is designed for R&D project leaders, entrepreneurs, and intrapreneurs: intellectual capital managers in small and medium-sized enterprises (SMEs), start-ups, technology transfer offices and investors.

EPO search tools to improve business decisions | BS01-2026

A seminar demonstrating how to effectively use the EPO's free search tools and the additional features offered by more advanced tools, that are of particular use to business decision makers.

Main subject matter:

- Using Espacenet to filter and analyse search results
- Using PATSTAT for more advanced statistics

Train the Trainer Espacenet | NW02-2025

This course enables you to plan and implement courses on Espacenet and other EPO search tools quickly and in a resource-efficient way. It is based on case studies, two of which you will look at as examples and another three on which you will actually work in hands-on sessions and transform by following the training approach.

How to make best use of the unitary patent system | BS03-2025

This training focuses on the advantages offered by the Unitary Patent system. Exploring how businesses can harness these benefits to protect and monetise their intellectual property paves the way for subsequent trainings featuring selected case studies from different industries. This training may be also of special interest for PATLIB centres.

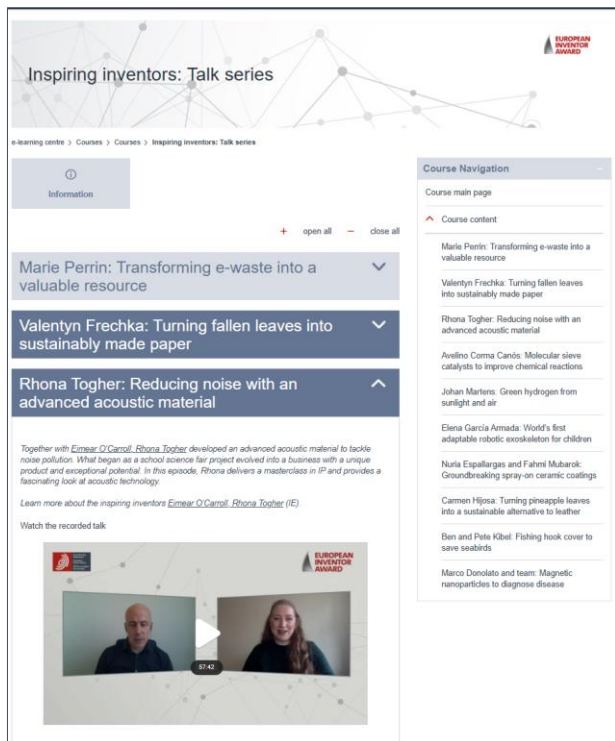
Train the Trainer Espacenet | NW01-2026

This course enables you to plan and implement courses on Espacenet and other EPO search tools quickly and in a resource-efficient way. It is based on case studies, two of which you will look at as examples and another three on which you will actually work in hands-on sessions and transform by following the training approach.

Patenting Innovation (RTTP-recognised) | NV07-2025

Patents are a powerful asset in the toolbox of a technology transfer professional. This two-day interactive course covers how innovative ideas are protected within the patenting system.

INSPIRING INVENTORS TALK SERIES



The screenshot shows the 'Inspiring inventors: Talk series' page on the e-learning centre. The page features a network diagram at the top. Below it, there's a section titled 'Information' with a list of talks by Marie Perrin, Valentyn Frechka, and Rhona Togher. Each talk has a dropdown arrow. Below the list, there's a paragraph about the series and a video player showing a recorded talk. On the right, there's a 'Course Navigation' sidebar with a list of course content items, each with a red arrow icon.

Inspiring inventors: Talk series

e-learning centre > Courses > Courses > Inspiring inventors: Talk series

Information

+ open all - close all

Marie Perrin: Transforming e-waste into a valuable resource

Valentyn Frechka: Turning fallen leaves into sustainably made paper

Rhona Togher: Reducing noise with an advanced acoustic material

Together with [Eimear O'Carroll](#), [Rhona Togher](#) developed an advanced acoustic material to tackle noise pollution. What began as a school science fair project evolved into a business with a unique product and exceptional potential. In this episode, Rhona delivers a masterclass in IP and provides a fascinating look at acoustic technology.

Learn more about the inspiring inventors [Eimear O'Carroll](#), [Rhona Togher](#) (IE)

Watch the recorded talk

07:42

COURSE NAVIGATION

Course main page

Course content

- Marie Perrin: Transforming e-waste into a valuable resource
- Valentyn Frechka: Turning fallen leaves into sustainably made paper
- Rhona Togher: Reducing noise with an advanced acoustic material
- Avelino Coma Candó: Molecular sieve catalysts to improve chemical reactions
- Johan Marlowe: Green hydrogen from sunlight and air
- Elena Garcia Armada: World's first adaptable robotic exoskeleton for children
- Nuria Espallargas and Fahmi Mubarak: Groundbreaking spray-on ceramic coatings
- Carmen Hjoera: Turning pineapple leaves into a sustainable alternative to leather
- Ben and Pete Kibel: Fishing hook cover to save seabirds
- Marco Donolato and team: Magnetic nanoparticles to diagnose disease

European Inventor Award finalists share their success stories on patenting and commercialising their inventions

[Course: Inspiring inventors: Talk series | e-learning centre](#)

Modular IP Education Framework (MIPeF)

Benefits

- Enrich your curriculum with a free of charge and high-quality IP course co-labelled with the European Patent Office
- Integrate a flexible, ready-made offer tailored to Master's and PhD programmes
- Adapt content easily to your academic calendar and specific course needs
- Benefit from expert-led online sessions and engaging, modular formats
- Inspire students with real-world case studies featuring European Inventor Award finalists and winners
- Provide students with the opportunity to earn an EPO certificate and ECTS credits
- Increase career opportunities for students through IP education



MIPeF timeline

- Courses are being offered twice a year with an autumn and a spring edition

Create – Protect – Innovate: Bringing ideas to market

Part 1: Entry level

- Module I**
Introduction to IP
- Module II**
Patent essentials
- Module III**
Introduction to patent information
- Module IV**
Patent information in practice
- Module V**
Developing an IP strategy

- [Syllabus Entry](#)
- [Course Description Entry](#)
- [Overview of skills and learning outcomes](#)

Part 2: Advanced level

- Module I**
Grant of patents
- Module II**
Enforcement of patents
- Module III**
Scouting and assessment of technology
- Module IV**
IP commercialisation
- Module V**
Use of IPRs

- [Syllabus Advanced](#)
- [Course Description Advanced](#)

Over
100 partner
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MIPEF

Modular IP Education Framework



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• Graz University of Technology • University of Graz • Technical University of Leoben • Wirtschaftsuniversität Wien	• Aalborg University	• Obuda University	• Cardinal Stefan Wyszyński University in Warsaw • Jagiellonian University • University of Silesia in Katowice • AGH University of Krakow
• University of Antwerp	• Tallinn University of Technology	• Trinity College Dublin • Technical University of Shannon • Atlantic Technological University • University College Cork	• Técnico University of Lisbon • NOVA University Lisbon • University of Trás-Montes and Alto Douro • Polytechnic University of Coimbra • University of Algarve • Polytechnic Institute of Castelo Branco
• Sofia University • Trakia University	• Carlos III University of Madrid • Pompeu Fabra University • University of Alicante • University of Valencia • Autonomous University of Barcelona • University of Alcalá • Comillas Pontifical University • University of Barcelona • Polytechnic University of Catalonia • University of Zaragoza	• Bocconi University • University of Brescia • Sant'Anna School of Advanced Studies – Pisa • University of Parma • Polytechnic University of Turin • Sapienza University of Rome • University of Calabria • University of Insubria • Libera Università Mediterranea • University of Naples Federico II • IUSS University School of Advanced Studies in Pavia • University of Teramo • University of Perugia • Ca' Foscari University of Venice • University of Rome III • IMT School for Advanced Studies • Università Cattolica del Sacro Cuore	• Babes-Bolyai University • West University of Timisoara • University of Agronomic Sciences and Veterinary Medicine of Bucharest • Technical University of Cluj-Napoca
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• VSB - Technical University of Ostrava	• EIT KIC Manufacturing • EIT HEI • 28Digital	• University of Turku • Hanken School of Economics • University of Oulu	• Stockholm University • Karolinska Institute • Chalmers University of Technology
	• University of Strasbourg • Paris-Saclay University • University of Technology of Compiègne	• University of Leeds - Faculty of Engineering & Physical Sciences • Centre for IP Policy & Management, Bournemouth University • University of Portsmouth • University of Exeter • University of Liverpool	• University of Ljubljana • Comenius University Bratislava • University of San Marino
		• Riga Stradins University • University of Latvia • Latvian University of Life Sciences and Technologies	• Istanbul Bilgi University • Ankara University • Koc University • Istinye University • Yildiz Technical University
		• University of Malta	

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[Modular IP Education Framework \(website\)](#)



European IP Helpdesk

- Service initiative of the European Commission
- Addressing **current and potential beneficiaries of EU-funded projects, researchers and EU SMEs**
- Free-of-charge first-line support on intellectual property (IP)
- Hands-on IP and innovation management support
- International pool of IP experts from various thematic fields
- Unique cooperation scheme with the Enterprise Europe Network: 43 ambassadors from 26 EU countries



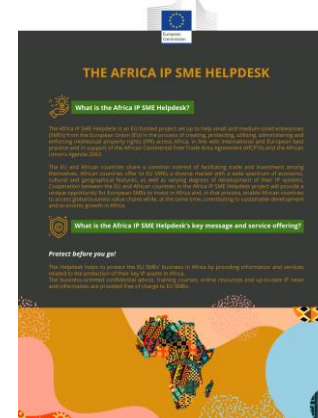
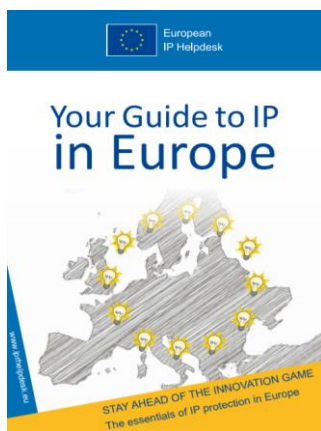


The EC IP Helpdesks





EC IP (SME) Helpdesk Hub – Gateway to Information



- E-learning modules & more
- Guides / Topic, country, sector-specific factsheets / Infographics
- Case studies



Ambassador Scheme

- **Cooperation scheme** with the Enterprise Europe Network (EEN): 43 ambassadors – 26 countries
- **Building IP capacities** among European SMEs
- **Overcoming language barriers**
- Making the topic **more accessible**
- Exchange and feedback from ambassadors on **needs of SMEs**
- Local **awareness** and **training events**





Upcoming events



15 JUL 2026	Training and workshops Protect your IP in medical technology: Focus on oncology ⌚ Live streaming available	02 SEP 2026	Training and workshops EU - Webinar: Introduction to IP ⌚ Live streaming available
03 SEP 2026	Training and workshops EU - Webinar: IP in Biotechnology ⌚ Live streaming available	11 SEP 2026	Training and workshops EU - Webinar: IP in Horizon Projects (HEU) ⌚ Live streaming available
17 SEP 2026	Training and workshops EU - Webinar: IP in Business collaborations for SMEs and Start-ups ⌚ Live streaming available	24 SEP 2026	Training and workshops EU - Webinar: IP and Artificial Intelligence ⌚ Live streaming available
30 SEP 2026	Training and workshops EU - Webinar: Copyright in collaborative projects ⌚ Live streaming available	15 OCT 2026	Training and workshops EU - Webinar: IP Management in ICT Projects ⌚ Live streaming available
23 OCT 2026	Training and workshops EU - Webinar: IP and Artificial Intelligence - Advanced ⌚ Live streaming available	13 NOV 2026	Training and workshops EU - Webinar AI Act ⌚ Live streaming available



Thank you!

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