LENS.ORG
Solving The Problem Of Problem Solving™

Lens PatSeq:
An open facility for biotech and patent professionals

September 17, 2020

Osmat A. Jefferson
Director of Lens Product Development, Cambia.
Professor of Science and Technology, QUT.

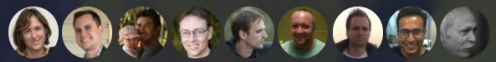
What is different now?

- Global crises demand better innovation practices.
- Problem solving requires effective partnerships and collective action.
- Open evidence, including patent knowledge, is critical for new solutions.
- Trust in public institutions to advance the public interest needs to be restored.

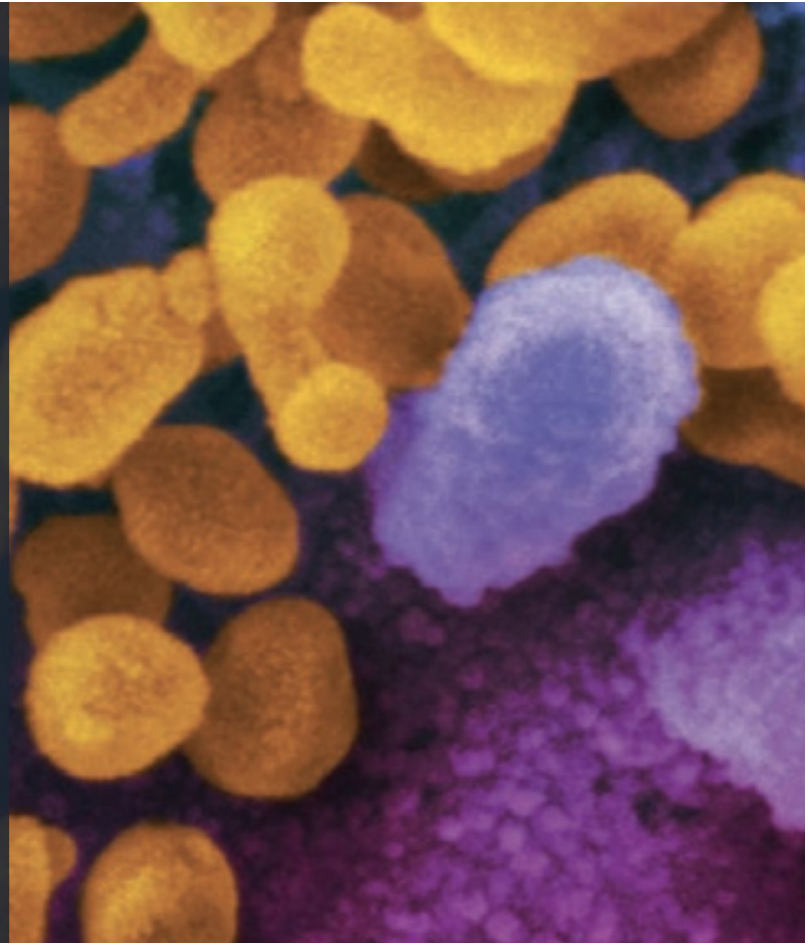
SARS-CoV-2: Navigating information overload with Lens.org

Evidence must be used to guide interventions for the COVID-19 pandemic, but that evidence must be comprehensive, credible and shared for it to be effective. This report focuses on how global scientific research and patenting activity relevant to SARS-CoV-2, including its genetics and pathogenesis, can be discovered and made transparent, open, shareable and navigable to help inform how it could be translated into intervention options.
We demonstrate how the platform Lens.org can be used to conduct reliable systematic scholarly and patent searches, refine and build domain-based collections to share publicly, and set alerts to receive notifications for updates. We also provide some analyses/comments on some of these collections. Our aim is to enable researchers to find clarity into the discovery, analysis, and translation of COVID-19 scientific and patent knowledge into products, practices or services to help mitigate the current crisis

Credit for background picture: a screenshot for SARS-CoV-2 from a photo in Immune Matter, im Spring 2020



Authored By: Osmat Azzam Jefferson, Simon Lang, Kenny Williams, Aaron Ballagh, Deniz Koellhofer, Ben Warren, Bernard Schellberg, Roshan Sharma, Richard Jefferson

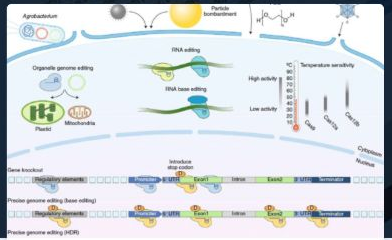


BETA 0.5

Introducing **Lens Reports**

Lens Reports is a new facility for creating evidence-based, open, sharable and reusable reports linked to real Lens data and analytics. The next evolution of Lens, search, collect, analyze, annotate and now present your findings in a flexible, data-driven reporting interface.

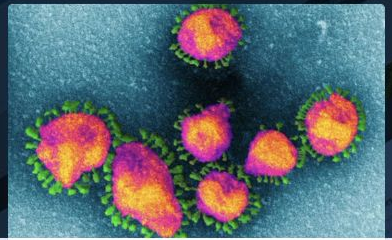
View Example Report | Request Early Access



GENETICS

Mapping innovation trajectories of CRISPR-Cas9 Technology

Fast and easy to implement, cheap and components are readily accessible, its versatility means that it delivers an end product. In plant cells, the technology can be applied to....



VIROLOGY

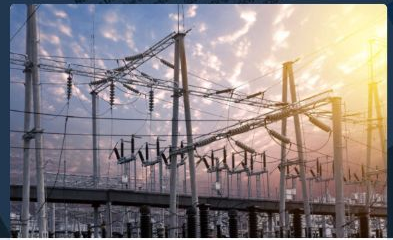
Human Coronaviruses: Patent and Research Landscape

The rapid outbreak of Wuhan coronavirus is pressing health authorities across the globe to better understand how this virus and other coronaviruses spread among humans...

AGRICULTURE

Regenerative Agriculture: Open evidence for its role in solving climate change

Regenerative agriculture refers to a set of practices that can build organic matter back into the soil, effectively storing more water and drawing more carbon out of the atmosphere....



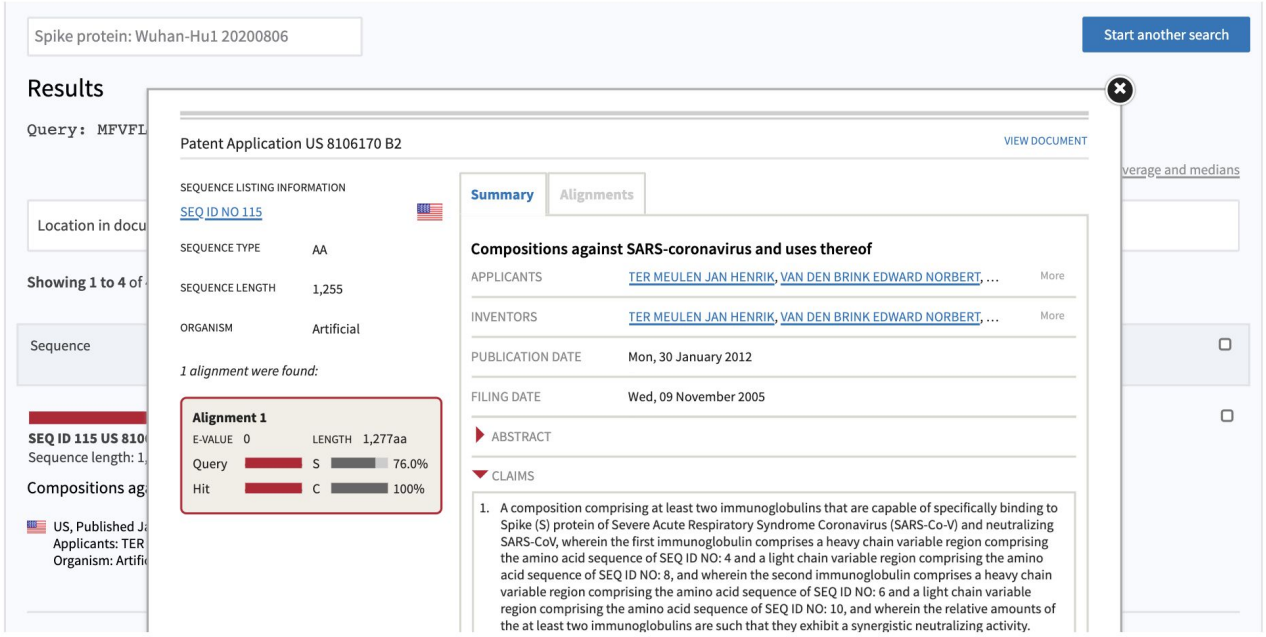
ENERGY

Ultra-Low-Cost Electricity Storage

Increasing penetrations of intermittent renewables, such as wind and solar power, on the world's power grids will require the deployment of growing amounts of energy storage...

Patent sequence search similarity results for SARS-CoV-2 Spike protein

To interpret, understand, and value the combined effect of a genetic sequence on a biological invention, the Lens provides an application, PatSeq Finder, that allows sequence-based similarity searches within the context of almost all known patent sequence disclosures to date. And by linking that information to that from the scientific literature, we can predict contextual uses in patents and potential products that are in the pipeline. Here, we show sequence similarity search results on the whole spike protein and identify three patent owners, Amgen Inc, Academia Sinica, and Crucell Holland BV who have referenced sequences similar to SARS-CoV-2 spike protein in their granted patent claims. More details on these granted patents and other patent applications are below.



View and track results in the Lens

Lens.org and Cambia

- Cambia, founded in 1992, started Patent Lens in 2001, the precursor of lens.org, the world's first free and open full text patent search capability.
- In 2006, launched the world's first public patent sequence search capability for United States patent applications.
- Since 2013, Lens.org has served the world most comprehensive public Patent Sequence platform to navigate biological patents from over 17 jurisdictions.
- In 2011, with seed money from USPTO, Cambia began extracting and resolving non-patent literature strings in collaboration with NIH-NCBI and Crossref.
- By 2014, Cambia linked non-patent literature to patents and began serving the data, created PatCite and In4M metric to map influence of research on industry and foster meaningful partnerships.
- Lens honors privacy and confidentiality and its data is fully open, shareable and reusable.
- The platform has been up 24/7 for over 20 years.

CURRENT OFFERINGS

Discovery, Analytics, And Management Tools

API & Data Facility:
Scholarly API, PatSeq bulk data, Patent API*

Collections:
based on Scholarly Works and Patents Lens searches and analyses.

Reports:
Assemble your saved queries and collections with other knowledge in a dynamic and interactive report*

In4M:
International Industry & Innovation Influence Mapping

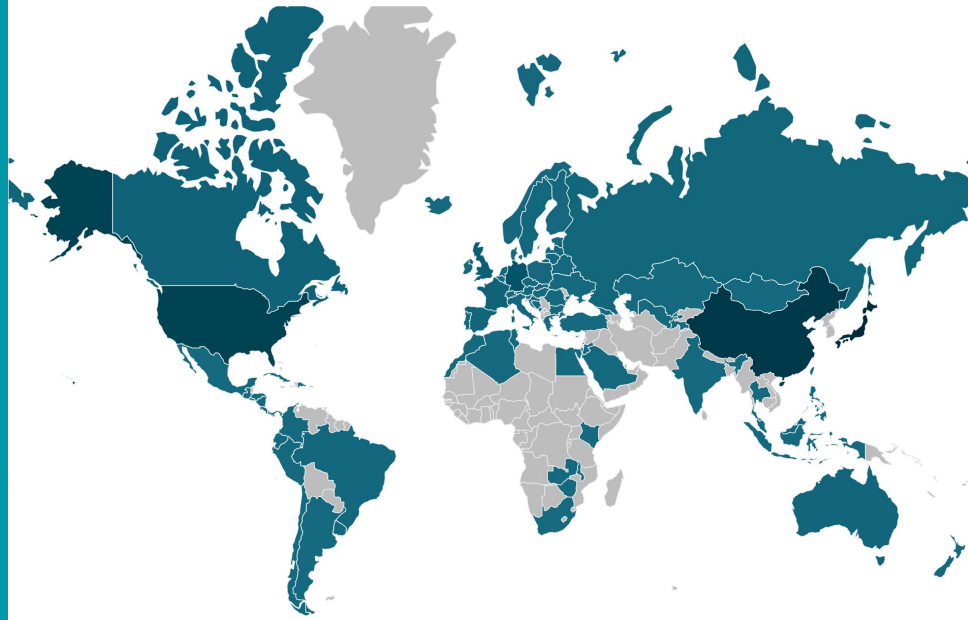
* coming soon

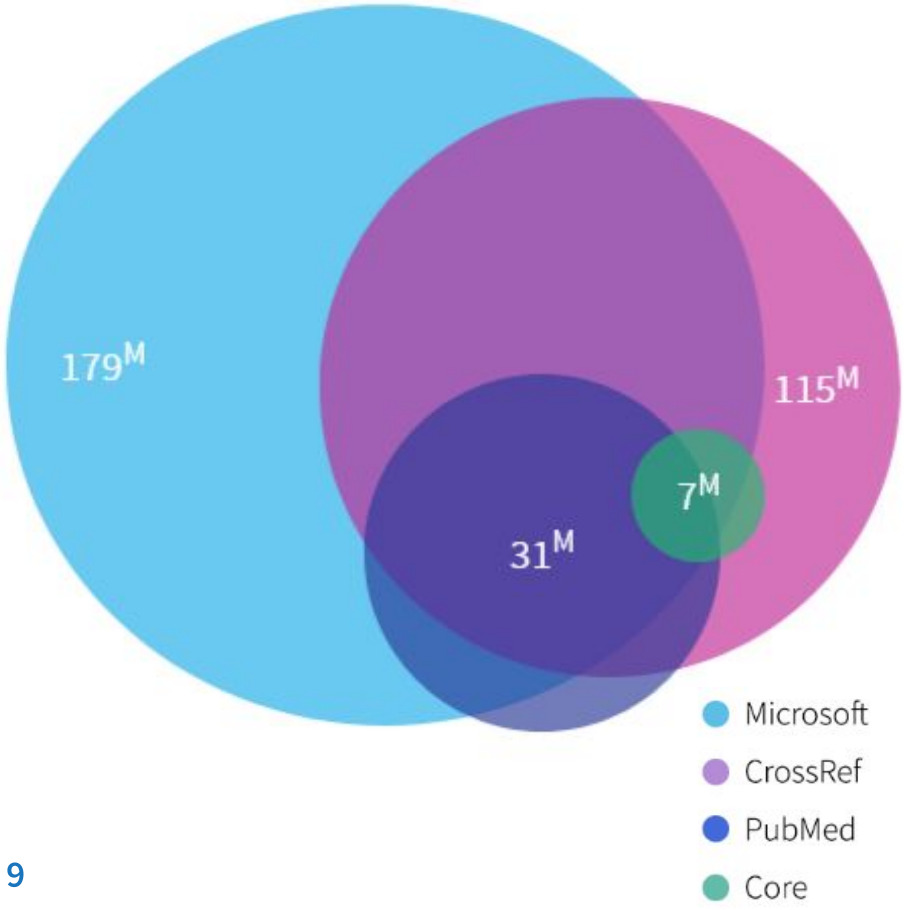
September 2020

Lens Patent Data

125.4 Million Patent Records:

- 105 jurisdictions
- 68.8M patent families
- 722k biological patents
- 360.6M patent sequences





September 2020

Lens Scholarly Data

220.4 million research publication records:

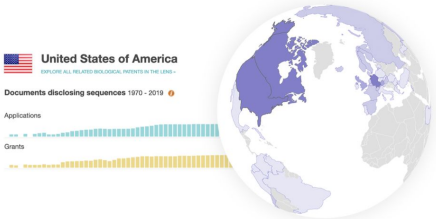
- 112.7M journal articles
- 17.5M Books and book chapters
- 7.3M conference proceedings
- 4.2M works cited in patents
- 74.1M works cited by other scholarly works
- 1.6B scholarly citations

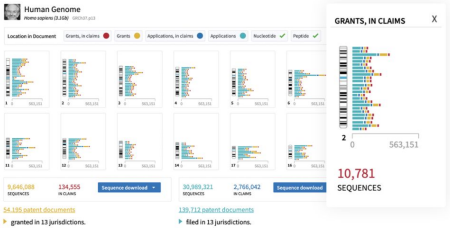
PatSeq **Data**

Compare biological patent holdings and view sequence disclosures across jurisdictions over time.

Patent Sequence Data is released to the public from 3 major sources: 1) national patent offices, 2) collaborating 3rd party public sequence listings repositories, and 3) regional or global intellectual property organizations.

> Start using Watch Video





PatSeq **Explorer**

Navigate and analyse patent-disclosed sequences mapped onto genomes and chromosomes.

The PatSeq Explorer offers a dynamic, embeddable, and multi-level view of mapped patent sequences on a genome of a specific organism. We currently offer patent sequences mapped onto the human, mouse, maize, rice, and soybean genomes, with other genomes to be mapped soon.

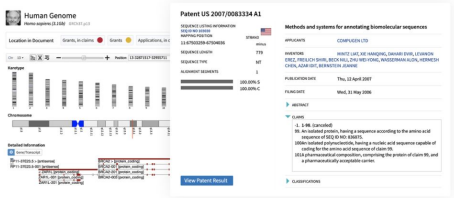
> Start using Watch Video

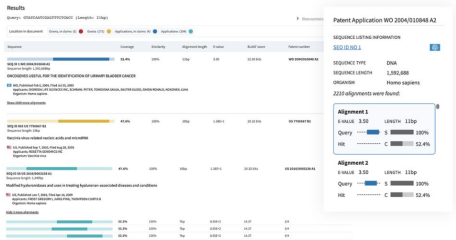
PatSeq **Analyzer**

Compare patenting activity at the chromosomal locus or gene level.

The PatSeq Analyzer is a modified genome viewer tool that is now a stand alone facility but links to PatSeq Explorer to give you a full view on a patent sequence details.

> Start using Watch Video





PatSeq **Finder**

Use input DNA or protein sequences to find matches in the Lens PatSeq database.

The PatSeq Finder is a sequence similarity search tool based on BLAST, allowing you to search the Lens patent sequence (PatSeq) databases for matches to a sequence of your interest. This tool is unique since it enables you to conduct sequence-based searches within more than 250 million patent sequences that we serve in either a nucleotide-based or protein-based databases.

> Start using

* PatSeq Text Not Pictured

PATSEQ

Explore Biological Sequences in Patents

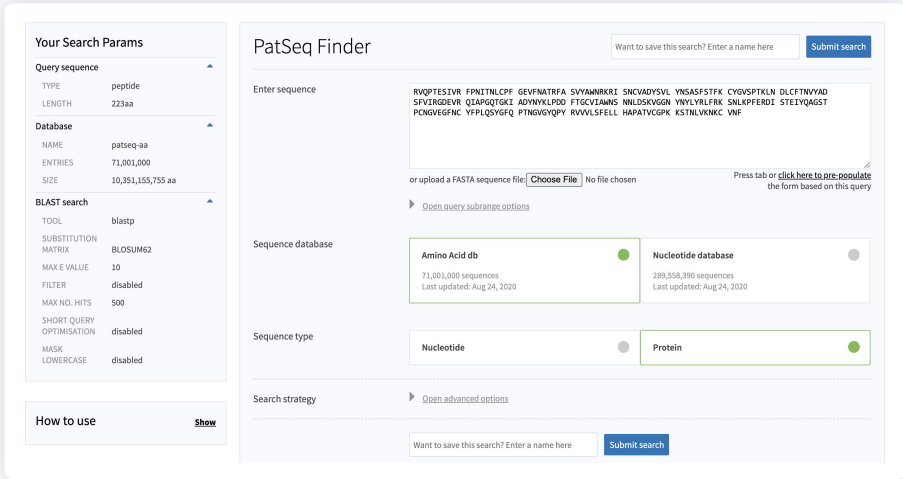
DNA and protein in patents are crucial to understand and harness new science for health, agriculture and the environment.

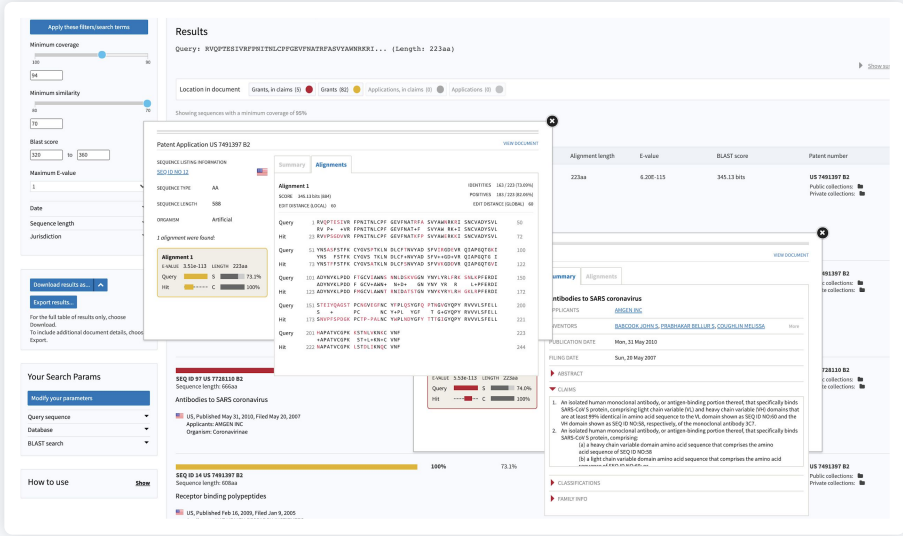
Lens hosts the world's largest publicly available database and toolkit for biological patents, with internal transparency.

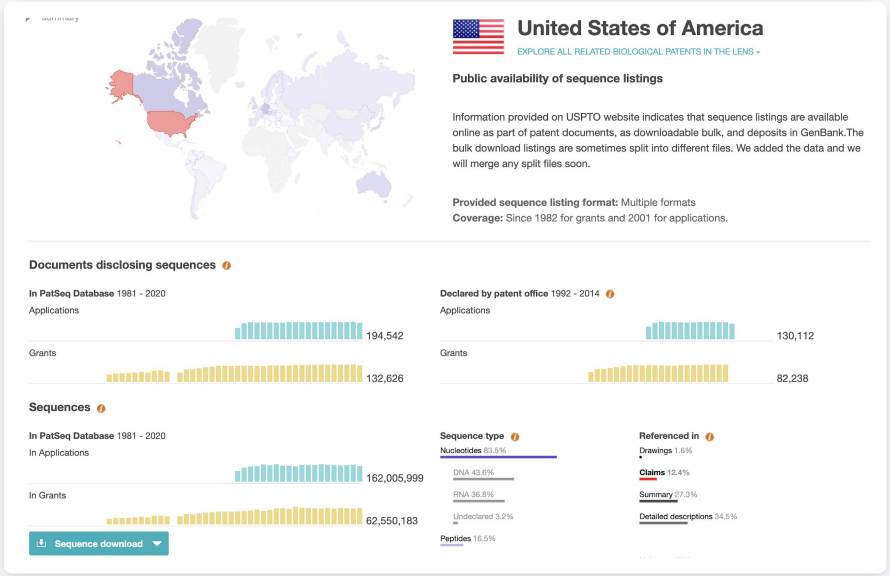
PatSeq Finder

Patent sequence search similarity tool

Using DNA, RNA, or Protein sequences, search-privately and securely- for similar sequences that are disclosed in the Lens patent databases. The tool is based in part on the public NIH-NCBI BLAST program. In the results view, compare sequence alignments or patent claims and/or export/embed findings.







PATSEQ

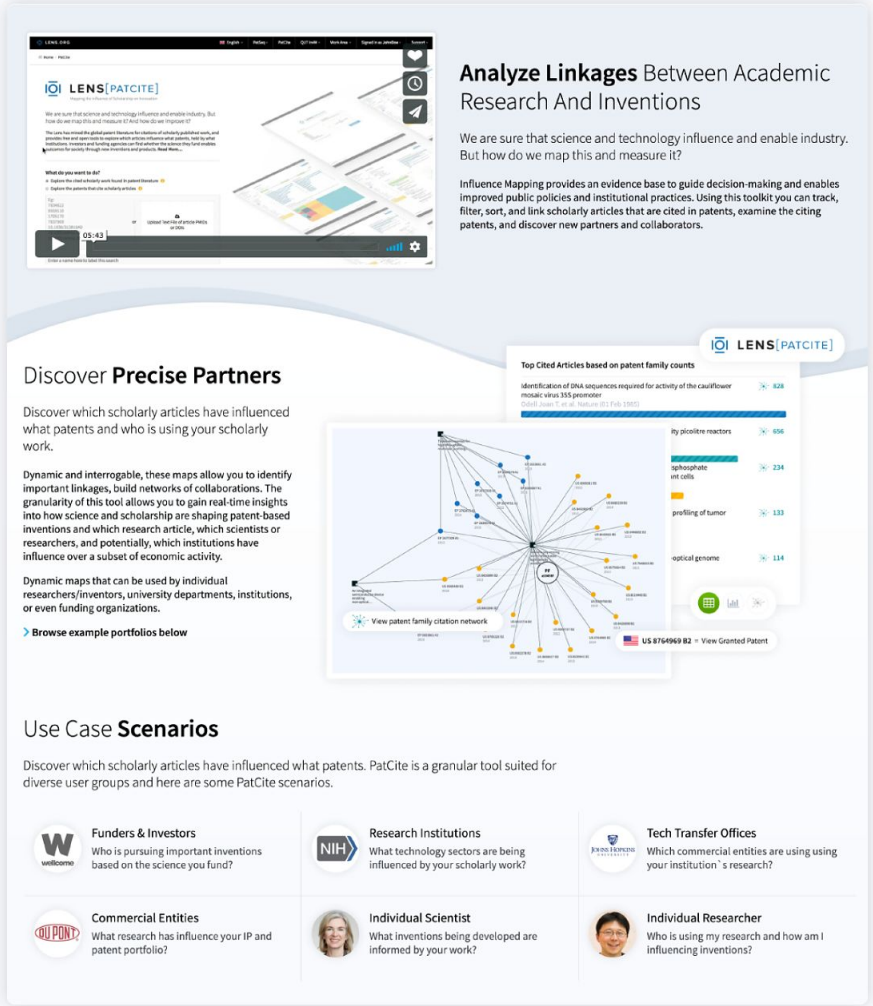
Transparency in PatSeq data

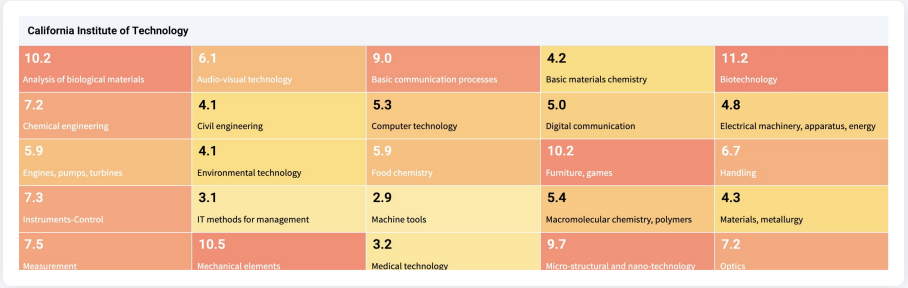
1. Check which jurisdictions make their data publicly available in machine searchable format.
2. Compare biological patent holdings with those disclosed by patent offices.
3. Verify the level of overlap among the various data sources including those from public databases.

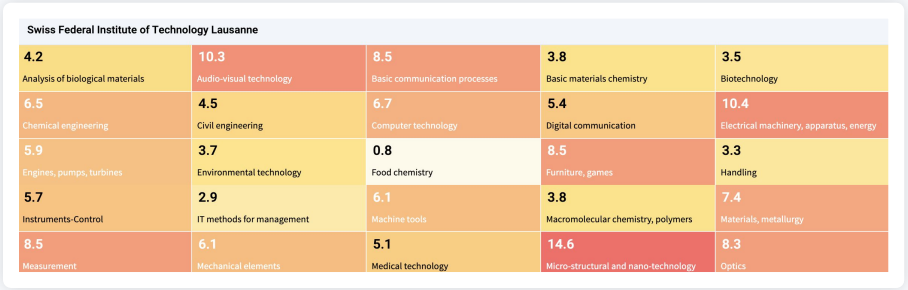
PATCITE

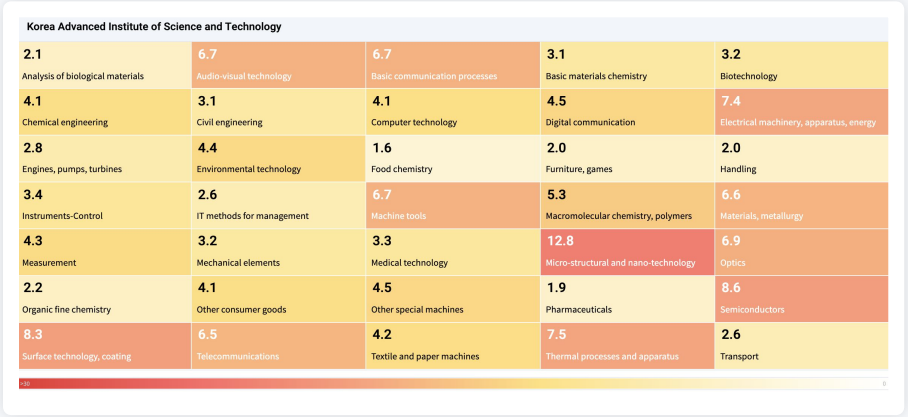
Open Influence Mapping Facility

Using open persistent identifiers, funders, investors, researchers, or departments can discover and analyse who in the industry has cited their works and map that influence on invention and innovation.





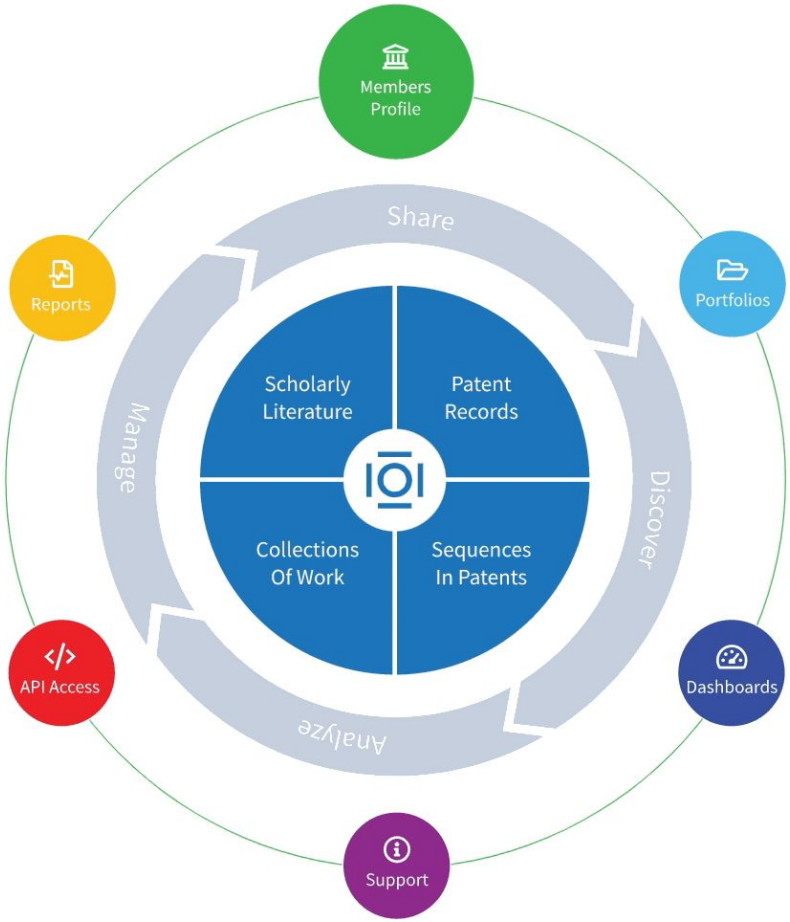




In4M:

International Industry & Innovation Influence Mapping

An open, transparent and dynamic tool to explore, expose and measure the degree to which an institution's work product influences outcomes for society, in myriad forms.



COLLECTIVE

The Lens Collective

Open. Inclusive. Comprehensive. Enabling.

Initially supported by the Bill & Melinda Gates Foundation, AP Sloan Foundation, The Rockefeller Foundation and Amazon Web Services.

The Lens Collective allows government agencies, research institutions, foundations and enterprise to join, support, shape, use and benefit from a sustainable open infrastructure.

Launching in January 2021.
Beta members joining now.