Using and Exploiting Patent Information

Andrew Czajkowski
Head, Innovation and Technology Support Section
Overview

- Why search?
- Search types and their uses
Why search?

- To retrieve information needed to answer specific questions.
Questions

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

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

- Can the validity of a given patent be challenged?

- Do patent rights exist on which a given product risks infringing?
State-of-the-art search

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

Uses
- Plan R&D activities more efficiently (avoid duplication of effort).
- Decide whether to enter a market.
- Determine which areas are not sufficiently covered by existing players.
- Identify competitors or potential partners.
Novelty/patentability search

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

Uses
- Decide whether to proceed with a patent application.
- Determine how to draft or amend claims to help ensure that they are accepted into the granted patent.
Validity/invalidity search

Question

- Can the validity of a given patent be challenged?

Uses

- Determine the enforceability of your own patents.
- Prepare an opposition/invalidity procedure against others’ patents.
- Prepare a defense against lawsuits claiming infringement of others’ patents.
Freedom-to-operate search

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

Uses
- Guide product design decisions.
- Identify patents that may need to be licensed.
State-of-the-art search (Review)

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

Uses
- Plan R&D activities more efficiently (avoid duplication of effort).
- Decide whether to enter a market.
- Determine which areas are not sufficiently covered by existing players.
- Identify competitors or potential partners.
Applicants and inventors
Office
Key dates
Invention
Citations
Legal status

According to one aspect, there is provided an airbag for applying a massage force, the airbag comprising: an inflat-
Levels of analysis

- Individual document
- Document sets (organized by document elements)
Analysis of document sets

- Applicant name → Top applicants, research collaborations
- Inventor name → Top inventors, research collaborations
- Applicant nationality / residence → Geographical distribution (origins)
- Office → Geographical distribution (targets)
Top applicants

- Search by technology
- Breakdown by patent applicant (name)

Source: WIPO Patent-based Technology Analysis Report – Alternative Energy Technology
Geographical distribution

- Search by technology
- Breakdown by receiving office → normalized across offices

Source: WIPO Patent-based Technology Analysis Report – Alternative Energy Technology
Uses

- Top applicants
  - Joint ventures
  - Mergers and acquisitions
  - Opportunities for transfer of technology and know-how
- Top inventors
  - Human resource planning
- Geographical distribution
  - Market analysis
  - Policy planning
Analysis of document sets

- Application date / publication date → Patenting trends
- Priority date (filter by legal status) → Patent lifecycle
- Applicant name vs. application date / publication date → Applicant patenting trends
Patenting trends

- Search by technology
- Breakdown by publication date

Source: WIPO Patent-based Technology Analysis Report – Alternative Energy Technology
Uses

- Patenting trends
- Geographical distribution
- Patent lifecycle
- Applicant patenting trends

→ Technology trends
→ Policy analysis
→ Patent portfolio analysis and valuation
→ R&D trends
Analysis of document sets

- Invention → Keyword maps
- Citations → Citation maps
Keyword maps

Source: Thomson Reuters
Citation maps

Source: Intellogist
Uses

- Keyword maps
- Citation maps
  → Research and technology linkages
  → Other relevant/similar technology document linkages
Additional data

Patent data can also be combined with non-patent information

- Scientific and technical information
- Economic information
  - R&D expenditure data
  - Human resources data
- Legal information
  - Licensing information
  - Ownership information
Patent landscape reports

- Support tool for policy-makers (governments, R&D, academia) and industry

- Themes
  - Public Health
  - Climate Change / Energy
  - Food and Agriculture

- Collaborations
  - African Agricultural Technology Foundation
  - Food and Agriculture Organization of the United Nations
  - UNITAID/Medicines Patent Pool
  - World Health Organization
Compilation of Published Patent Landscape Reports

Patent landscape reports on various topics have been published by international organizations, national intellectual property offices, non-governmental organizations and private sector entities. WIPO has compiled a list of such reports that are freely available or can be obtained upon request, either free of charge or for a fee.

Please note that this compilation is not exhaustive and that WIPO wishes to extend it. For that purpose, if you wish your report to be included or happen to know of other such reports, please contact patent.information@wipo.int

The patent landscape reports of this compilation have been grouped according to the following categories:

- Public Health/Life Sciences
- Climate Change/Energy
- Food and Agriculture
- Other Patent Landscape Reports/Related Links

Public Health/Life Sciences

<table>
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<th>TITLE</th>
<th>AUTHOR</th>
<th>DATE</th>
<th>LANGUAGE</th>
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<td>Analysis of &quot;Junk DNA&quot; Patents</td>
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<td>Determining the Patent Status of Essential Medicines in Developing Countries</td>
<td>MGF/WHO/UNAIDS Secretariat</td>
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<td>The Patenting of Human DNA: Global Trends in Public and Private Sector Activity</td>
<td>Science and Technology Policy Research (SPRU), University of Sussex</td>
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<td>Patent Landscape of H5N1 Influenza Virus</td>
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<td>Patent Landscape of Adenoviral Vector Vaccines for HIV (Educational series report)</td>
<td>Pierce Law ITT</td>
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Scenario

A research institute intends to focus its activities on the genetic engineering of maize. You have been asked to carry out the following tasks to support the work of the institute:

- Gather information about related inventions;
- Identify possible cooperation partners;
- Show how patenting activity in this area has evolved over time.
Tasks

- Gather information about related inventions
  - Retrieve individual documents

- Identify possible cooperation partners;
- Show how patenting activity in this area has evolved over time.
  - Analyze document sets
Search using PATENTSCOPE

Using PATENTSCOPE you can search 18,749,642 patent documents including 2,201,550 published international patent applications (PCT). Detailed coverage information can be found here (→).

To improve the PATENTSCOPE search system, we have slightly modified some of the web pages. Here is a list of the interfaces (tabs rearranged, reorganized list of countries):

- more options for the results list such as FP Image View Only and the List Length
- improved navigation for the PDF viewer

Join our webinar on March 19 or 20 for a detailed description of those new features aiming to make the latest version of PATENTSCOPE more efficient for users.
Query

Genetic engineering

IC: ("C12N 15/00" OR A01H)

Maize

ALLTXT: (maize OR corn OR mielie OR mealie OR "Zea mays" OR "Z mays")

→ IC: ("C12N 15/00" OR A01H) AND ALLTXT: (maize OR corn OR mielie OR mealie OR "Zea mays" OR "Z mays")
Query

Advanced Search

Search For:

IC: ("C12N 15/00" OR A01H) AND ALLOR (maize OR corn OR mays OR "maize mays" OR "Zea mays")
## Results

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<td>1</td>
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<td>Zea mays plants and transgenic Zea mays plants regenerated from protoplasts or protoplast-derived cells</td>
<td>10.06.2008</td>
<td>A01H C000</td>
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Methods of regenerating fertile *Zea mays* plants from protoplasts or protoplast-derived cells are described. The protoplasts or cells may be derived from embryogenic cell cultures or callus cultures. The protoplasts, cells, and resulting plants may be transgenic, containing, for example, chimeric genes coding for a polypeptide having substantially the insect toxicity properties of the crystal protein produced by Bacillus thuringiensis.

| 2  | EP  | IMPROVED METHODS FOR THE PRODUCTION OF STABLY TRANSFORMED, FERTILE ZEA MAYS PLANTS | 12.03.2008 | C12N 15/82 | 06763841 | BASF PLANT SCIENCE GMBH | PENG JIANYING |

The present invention relates to improved methods for the incorporation of DNA into the genome of a *Zea mays* plant by means of *Agrobacterium*-mediated transformation. Preferred is the use of the *Zea mays* lines deposited with American Type Culture Collection under the Patent Deposit Designation PTA-6170 and PTA-8171.


The present invention relates to improved methods for the incorporation of DNA into the genome of a *Zea mays* plant by means of *Agrobacterium*-mediated transformation. Preferred is the use of the *Zea mays* lines deposited with American Type Culture Collection under the Patent Deposit Designation PTA-6170 and PTA-8171.

| 4  | WO  | WO2012/065186 - DOMINANT NEGATIVE MUTANT KRP-RELATED PROTEINS (KRP) IN ZEA MAYS AND METHODS OF THEIR USE | 18.05.2012 | C12N 15/82 | PCT/US2011 005593 | TARGETED GROWTH, INC. | OLIVER, Jean Paul |

The present invention provides expression vectors comprising polynucleotides encoding mutant *Zea mays* KRP dominant negative proteins, and methods of using the same. In addition, transgenic plants expressing said KRP dominant negative proteins are provided. Furthermore, methods of increasing average seed weight, seed size, seed number and/or yield of a plant by using said KRP dominant negative proteins are provided.
Individual document

- Applicants and inventors
- Office
- Key dates
- Invention data

WIPO
WORLD INTELLIGENT PROPERTY ORGANIZATION
IMPROVED METHODS FOR THE PRODUCTION OF STABLY TRANSFORMED, FERTILE ZEA MAYS PLANTS

BACKGROUND OF THE INVENTION

Field of the Invention
The present invention relates to improved methods for the incorporation of DNA into the genome of a Zea mays plant by means of Agrobacterium-mediated transformation.

Description of the Related Art
During the past decade, it has become possible to transfer genes from a wide range of organisms to crop plants by recombinant DNA technology. This advance has provided enormous opportunities to improve plant resistance to pests, diseases and herbicides, and to modify biosynthetic processes to change the quality of plant products. However, the availability of an efficient transformation method to introduce foreign DNA remains to be a substantial barrier for most monocot species, including maize.
DETAILED DESCRIPTION OF THE INVENTION

A first embodiment of the invention relates to a method for generating a transgenic Zea mays plant comprising the steps of
a. isolating an immature embryo of a Zea mays plant, and
b. co-cultivating said isolated immature embryo, which has not been subjected to a dedifferentiation treatment, with a soil-borne bacterium belonging to genus Rhizobiaceae comprising at least one transgenic T-DNA, said T-DNA comprising at least one selectable marker gene, with a co-cultivation medium, and
c. transferring the co-cultivated immature embryos to a recovering medium comprising
   i. an effective amount of at least one antibiotic that inhibits or suppresses the growth of soil-borne bacterium, and
   ii. L-proline in a concentration from about 1 g/l to about 10 g/l, and
   iii. silver nitrate in a concentration from about 1 μM to about 50 μM, and
   iv. an effective amount of at least one auxin compound,
      but not comprising an effective amount of a phytotoxic selection agent, and
d. inducing formation of embryogenic callus and selecting transgenic callus on a medium comprising,
   i. an effective amount of at least one auxin compound, and
   ii. an effective amount of a selection agent allowing for selection of cells comprising the transgenic, and
Results

Results 1-10 of 18,280

Criteria: "C12N 15/00" OR A01H AND ALLTXT:(maize OR corn OR mielie OR mealie OR "Zea mays" OR "Z mays")

Office(s): All
Language: EN
Stemming: true

Page: 1 / 1829

Search

RSS

Query Tree
### Results: Analysis

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Results: Analysis (applicant)
Results: Analysis (applicant)
Analysis: Findings

Top applicants include a number of well-known companies in the agriculture and agrochemicals industries but also a number of universities and public research institutions.
## Results: Analysis

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Analysis: Findings

- Exceptionally strong growth in patent filing activity from 1995 onwards, even compared to growth in overall patent filing activity
- Slowdown in growth from 2002 onwards
Novelty/patentability search (Review)

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

Uses
■ Decide whether to proceed with a patent application.
■ Determine how to draft or amend claims to help ensure that they are accepted into the granted patent.
Patentability

- Patentable subject matter
- Patentability criteria
  - Novelty
  - Inventive step/non-obviousness
  - Industrial applicability/utility
Novelty

Invention

- Feature A
- Feature B
- Feature C
- Feature D

Prior art

- Feature A
- Feature B
- Feature C
- Feature D
Inventive step/non-obviousness

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<th>Prior art</th>
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<td>Feature D</td>
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"obvious combination"
Inventive step/non-obviousness

Invention

- Feature A
- Feature B
- Feature C
- Feature D

Prior art

- Feature A
- Feature B
- Feature C
- Feature D

Feature C obvious
Freedom-to-operate search (Review)

Question
- Do patent rights exist that a given technology (product or process) risks infringing?

Uses
- Guide product design decisions.
- Identify patents that may need to be licensed.
Question

Which part of a patent defines the scope of protection granted?

(a) Title
(b) Abstract
(c) Description
(d) Claims
(e) All of the above
Which part of a patent defines the scope of protection granted?

(a) Title
(b) Abstract
(c) Description
(d) Claims
(e) All of the above
Claims

- Claims (largely) define the scope of protection offered by a patent

→ Focus on claims in the analysis of your search results
Question

- A company would like to manufacture and sell a product in Mexico that can be described as "a lithium battery using a crystalline ceramic membrane".
- A patent is in force in Mexico that claims "a lithium battery using a crystalline ceramic membrane".

Photo source: Krzysztof Woźnica (Wikimedia)
<table>
<thead>
<tr>
<th>Product/Feature</th>
<th>Claims</th>
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<tbody>
<tr>
<td>a lithium battery using a porous ceramic membrane</td>
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</tr>
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</table>

Would the company infringe this patent if it manufactures and sells its product?

→ Yes, the product matches the claims.
Question

- A company would like to manufacture and sell a product in Mexico that can be described as "a lithium battery using a crystalline ceramic membrane".

- A patent is in force in Mexico that claims "an alkali metal battery using a crystalline inorganic membrane".

Photo source: W. Oelen (Wikimedia)
Question

Would the company infringe this patent if it manufactures and sells its product?

→ Yes, the product is encompassed by the claims

<table>
<thead>
<tr>
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<td>a lithium battery using a porous ceramic membrane</td>
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### Summary

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Adapted from: Gerhard Fischer, "Freedom-to-Operate search: Issues and practical exercises"
Claims

- A patent may be infringed if features of a technology match or are encompassed by its claims.

  → Take into account synonyms and other ways of expressing your features (e.g. classification).
  → Include more general features that would encompass the specific features of your technology in your search.
Further FTO Considerations

Documents
- Patents
- Patent applications?

Countries and regions
- National patent
- Regional patents, e.g. European Patent Office
- PCT?

Dates
- Filing date (20 years plus 5 years safety margin)?
And don’t forget!

- A product consists of many elements that may be protected by different intellectual property rights (and other legal rights), not only patents.
  - marks (e.g. distinctive markings or coloring)
  - industrial designs (e.g. decorative elements)
  - copyright (e.g. user manual)
Any questions?

For more information, please contact:

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