Intro to Patents

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Intro to Patents

• Key Patent Facts:

  • contract theory: the Government gives an inventor a period (20 years from the filing date) of exclusivity in exchange for full disclosure of the invention to the public (“quid pro quo”)

  • negative right: a patent gives the right to exclude all others from making, using, offering for sale, selling, or importing
    – does NOT give a right to make or sell a product
    – can be dominated by a broader patent
Types of Patent filings

• Provisional Patent Applications:
  
  **benefits:**
  – can be very informal (does not require claims or inventor signature)
  – allows for continued technology development
  – additional year of patent term

  **limitations:**
  – must convert both U.S. and foreign apps in 12 months
  – only a placeholder; will not publish or be examined
  – must meet enablement requirements

• Non-provisional (or Utility) Patent Applications – examined by USPTO

What is Patentable?

- “Anything under the sun made by the hands of man”
  - new chemical compounds, *e.g.*, drugs, pesticides
  - methods of producing new compounds
  - new uses for old compounds
  - purified natural materials, *e.g.*, DNA, enzymes
  - transgenic animals or plants
  - new formulations or mixtures, *e.g.*, alloys, shampoos
What is NOT Patentable?
What is NOT Patentable?

Laws of nature, physical phenomena, and abstract ideas are not patentable.
3 Criteria for Receiving a Patent

1) **Utility**
   - demonstrated or proposed use that one of “ordinary skill in the art” would believe provides identifiable benefit and is capable of doing so

2) **Novelty**
   - not patented, described in a single printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the invention

3) **Non-obviousness**
   - whether one skilled in the art at the time of the invention would have had a rational basis to combine prior art to reach the claimed invention with a reasonable expectation of success
Examples of patents by technology type
Having described the invention, I claim:

1. An apparatus for implantation into a bone in a patient's spine or pelvis, said apparatus, when implanted, being resistant to toggling in the bone and to being pulled from the bone, said apparatus comprising:

   a platform having a first surface for facing a bone in a patient's spine or pelvis, said first surface being solid and extending generally transverse to a longitudinal axis of said apparatus, said platform including structure for connection to a spinal fixation implant; and

   at least one helical spike for embedding into the bone upon rotation of said platform, said at least one helical spike projecting tangentially from said first surface of said platform and extending around said longitudinal axis, said at least one helical spike having a proximal end and a distal end;

   said at least one helical spike including a tip portion at said distal end which penetrates into the bone as said platform is rotated, a connecting portion at said proximal end connected to said first surface of said platform, and an intermediate portion extending between said connecting portion and said tip portion.
It is claimed:

1. A method for suppressing or preventing pain, movement disorders, epilepsy, cerebrovascular diseases, autoimmune diseases, sleep disorders, autonomic disorders, urinary bladder disorders, abnormal metabolic states, disorders of the muscular system, and/or neuropsychiatric disorders in a patient, the method comprising:

   positioning at least one electrode on or proximate to at least one of the patient’s sphenopalatine ganglia, sphenopalatine nerves, or vidian nerves;
   
   activating the at least one electrode to apply an electrical signal to at least one of the sphenopalatine ganglia, sphenopalatine nerves, or vidian nerves, the electrical signal generating heat insufficient to cause a lesion on the at least one of the sphenopalatine ganglia, sphenopalatine nerves, or vidian nerves.
What is claimed is:
1. A method for detecting MPO activity and/or mass and F2-isoprostane levels comprising:
   a) providing:
      i) a first assay for determining the level of MPO activity and/or MPO mass in a bodily sample from a human subject, wherein said first assay employs an anti-MPO antibody; and
      ii) a second assay for determining a level of an MPO-generated oxidation product from said bodily sample, wherein said MPO-generated oxidation product comprises F2-isoprostane (F2-iso); and
   b) performing said first and second assays to obtain an MPO activity and/or mass level and an F2-isoprostane level from said bodily sample, wherein said bodily sample is selected from plasma, serum, urine, or blood.
Therapeutic Patent

United States Patent

Li et al.

Patent No.: US 9,611,295 B2
Date of Patent: Apr. 4, 2017

TREATMENT OF IL-17 MEDIATED DISEASE
BY BLOCKING SEFIR-SEFIR
INTERACTIONS

What is claimed is:

1. A decoy peptide consisting of less than about 50 amino acids substantially homologous to at least a portion of the amino acid sequence of the αC helix region of the SEFIR domain of Act 1 and comprising the amino acid sequence HGLHXXKY (SEQ ID NO: 1), wherein the decoy peptide competitively inhibits the binding of interleukin-17 receptor (IL-17R) to adaptor protein nuclear factor κB activator 1 (Act 1).

8. A method of treating an interleukin-17 (IL-17) mediated disease in a subject, comprising administering to the subject having the interleukin-17 mediated disease a therapeutically effective amount of the decoy peptide of claim 1.
What is claimed is:

1. A computer-implemented method, comprising:
   acquiring data from at least one data source, the acquired data including health data comprising a plurality of data objects for at least one patient, wherein the at least one data source comprises an electronic health record repository;
   transforming the acquired data into episode model data according to a context-specific data model and storing the episode model data in a database for an episode of care corresponding to a set of health care services for the at least one patient;
   generating at least one inverted index document for at least a portion of an episode for the patient based on the episode model data, the generating comprising:
   determining a qualified name for selected data objects in the episode model data according to the context-specific data model, the qualified name comprising at least two of a temporal identifier specifying one of a plurality of time segments for the episode of care in which each of the selected data objects has been determined to reside, a field name providing a descriptor to represent information content for each of the selected data objects, and a data type indicating a predefined characteristic for data values stored in each of the selected data objects; and
   adding the qualified name to each of the selected data objects in the inverted index document according to a schema; and
   constructing a query request to search the at least one inverted index document, the query request comprising search terms corresponding to at least one of the temporal parameter, the field name, and the data type of the qualified name associated with at least one of the selected data objects; and
   providing results data from the at least one inverted index in response to searching based on the query request, whereby the time to retrieve data from the electronic health record repository is reduced.
What is claimed is:
1. A method comprising:
   retrieving a first image of an anatomic region and a second image of the anatomic region from a non-transitory memory;
   aligning the first image and the second image to generate a rigidly aligned image;
   registering the first image to the rigidly aligned image;
   generating a vector field mapping based on the registration of the first image to the rigidly aligned image to provide displacement data describing displacement between the first image and the second image; and
   providing feedback to a user based on the vector field mapping,
   wherein the feedback indicates at least one of:
   a compensation distance or a trajectory required to target a specific preoperatively identified structure; or
   a prediction of an equilibrium location of a structure identified intraoperatively or postoperatively.
Brown Biomedical Innovations to Impact

Introduction to Academic Biomedical Accelerator

Karen Bulock PhD, Managing Director
March 10, 2022
So, you have an idea/patent for a biomedical product.

Now what?
The Idea-to-Impact Gap

NIH-funded basic research

Academic Accelerators: Bridge the Gap

Industry/Commercialization
BBII Program Goals

*Launched in 2018 with ~$8M in philanthropic gifts*

- Encourage and enable a culture of biomedical entrepreneurship at Brown
- Support translating basic research discoveries into products with commercial potential
  - Provide consulting and advice on technology/product development
  - Provide funding for well-defined, product-focused proposals
  - Move products along the path to commercialization
Brown Biomedical Innovation to Impact

Advice/Coaching

• Feedback from external reviewers
• Programming in technology development

Funding

• Competitive proposal process
• Product focused with $100K for one year

Project Management

• Milestones defined
• Funding paid in tranches
• Consultants and CROs

Commercial Development Opportunities

• BBII collaborates with Brown Tech Innovations
• Connect with industry, venture capital and start-up resources and entrepreneurs
What makes a competitive proposal?

- Great science and technical merit

AND

- Unmet need: What is the problem?
- Technology/product: How will your technology solve the problem?
- Commercial market
- Intellectual property
- Early development plan
BBII Eligibility

- Faculty whose principal appointment is at Brown University (covered by the Brown University IP policy)
- Investigators at Lifespan or Care New England with Brown faculty appointments
Want to learn more?

Please connect:
karen_bulock@brown.edu
Academic Technology Commercialization

Neil Veloso
Executive Director
Brown Technology Innovations
Agenda

- Academic Technology Transfer
- Licensing and Faculty Startups
Academic Technology Transfer

Formalized with the passage of federal Bayh-Dole Act (1980)

TTO models:
- A university department
- A standalone foundation
Technology transfer office structure

Multiple functions within a TTO.

Horizontal vs Vertical Office Structure

Primary focus area is “licensing.”

<table>
<thead>
<tr>
<th>Specialty Representation in TTOs*</th>
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<tbody>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>None</td>
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</tbody>
</table>

*Table 1: Specialty Representation in TTOs*
A Focus on Startups

TTOs have shifted towards licensing to startups vs. established companies.

“University Based Venture Funds” are sexy but not the norm.

Incubator and entrepreneurship programs have grown.

Product Development Focused research funding fits within the academic workflow.

<table>
<thead>
<tr>
<th>TABLE 9. BARRIERS TO COMPLETING MORE PROJECTS*</th>
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<tbody>
<tr>
<td>Lack of entrepreneurship among faculty</td>
</tr>
<tr>
<td>Academic resistance to commercialization efforts</td>
</tr>
<tr>
<td>Lack of internal IP/legal support</td>
</tr>
<tr>
<td>Physical space</td>
</tr>
<tr>
<td>Lack of continuing education on developments in IP law</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>FIGURE 10. INCUBATION RESOURCES ON CAMPUS*</th>
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<tbody>
<tr>
<td>23% No</td>
</tr>
<tr>
<td>77% Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FIGURE 11. INVEST IN COMMERCIAL PROGRAM SPINOUTS*</th>
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<tbody>
<tr>
<td>31% Yes</td>
</tr>
<tr>
<td>69% No</td>
</tr>
</tbody>
</table>
Licensing/Options

• Patents

• Accessing patented product?

• A license?

• Types of license agreements:
  - Exclusive License
  - Non-exclusive License

• Option

  - Not Products
  - Licensing
  - Covenant not to sue.
  - Exclusive right to negotiate
Anatomy of a License Agreement

The Licensor grants the Licensee:
  • The ability to make, have made, use, sell or offer to sell Products from the Patent.
  • The ability to sublicense.
  • The ability to pursue infringers.

In exchange for these rights, the Licensee:
  • Pays the licensor upfront, milestone and downstream royalties on product income, sublicense fees and infringement awards.
  • Continues prosecution of the patents (usually in licensor’s name).
  • Reports on the progress of product development and sales.
  • Indemnifies the Licensor against liabilities.
## Commercialization Growth around Faculty Innovation

### Faculty Startups

<table>
<thead>
<tr>
<th>Company</th>
<th>Founder</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transposon</td>
<td>Sedivy</td>
<td>Fallon</td>
</tr>
<tr>
<td>Bolden Therapeutics</td>
<td>Elias, Kurtis</td>
<td>Walsh</td>
</tr>
<tr>
<td>Pedialydx</td>
<td>Silverman</td>
<td>Stein</td>
</tr>
<tr>
<td>Research Instruments Corporation</td>
<td>Rose-Petruck</td>
<td>More to come!</td>
</tr>
</tbody>
</table>

More to come!
Thank you!

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