Knobbe Martens

Surfing The Waves of US IP Trends

Tips for Smoothly Riding the Waves in Written Description and Enablement

Jessica Achtsam
Dan Altman
Eric Furman, Ph.D.
Jason Gersting, Ph.D.

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Agenda

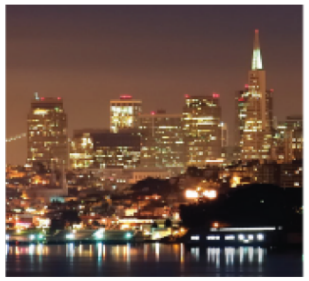
- Introduction
- Breakdown of the requirements
- Tips for Smoothly Riding the Ups and Downs of Written Description and Enablement
  - Background, vignettes and war stories
  - Interactive discussion
- Further Q&A
- Reception to follow

Firm Profile

- One of the largest IP law firms in the world, with about 300 lawyers and scientists representing a complete spectrum of technologies.
- Offices throughout US:
  - California
    - Orange County, San Diego, Los Angeles, San Francisco
  - Seattle
  - East Coast:
    - Washington D.C.
    - New York







Firm Profile

- Focus on all aspects of intellectual property (global procurement, M&A, defense and enforcement of patents, trademarks, copyrights, and trade secrets)
- Unmatched technical and litigation expertise to deliver superior results

  - Ranked Tier 1 Nationwide for Patent, Trademark & Litigation in 2022
  - Ranked “Band 1” for Patent Prosecution in the California market in 2022
  - Ranked Leading Law Firm for Patent Prosecution, Transactions & Litigation in 2021
  - Recognized Nationally and Regionally in 2021 for Life Sciences, Patent Contentious, Patent Prosecution, Trademark Contentious, Trademark Prosecution and PTAB Litigation
  - Ranked a 2021 Top California Law Firm for Patent Prosecution and Recognized for Life Sciences and Patent Litigation
  - Ranked Nationally in 2021 for Patent Licensing, Patent Litigation, Patent Prosecution and Trademarks

Background – Today's Knobbe Panel

Jessica Achtsam

- Client Practice & Portfolio Management
- Over a decade of experience in patent and medical device and biotechnology fields, particularly in wound care and orthopedic devices

Dan Altman

- Client Practice & Portfolio Management
- Over three decades of experience in US and International patent, trademark and licensing in the biotechnology, pharmaceutical and chemical industries

Eric Furman, Ph.D.

- Client Practice & Portfolio Management
- Nearly 25 years of experience in US and foreign patent prosecution, due diligence, and licensing in the biotechnology, pharmaceutical, and medical device industries

Jason Gersting, Ph.D.

- Client Practice & Portfolio Management
- Over a 15 years of experience in US and OUS patent and trademark procurement in biotechnology and medical device, due diligence, transactional work

Tips for Smoothly Riding the Waves of §112

- Disclaimer regarding our discussion:
  - This area is in flux, so we are being selective
  - Focusing on biopharma and medtech
    - Some inherent issue specificity
    - There are practical considerations as well
  - Exciting & fundamental issues
    - Again happy to discuss others at our reception

- Interactive
  - We have plenty of time for questions

35 U.S. Code §112 – The General Gist

- Sets forth the requirements are for the specification and claims

- Primary Elements
  - Written Description
  - Enablement
  - Best Mode

- Other Up and Coming (maybe?) Elements
  - Claims to a combination; a.k.a. “means plus function”

- Housekeeping Elements
  - Indefiniteness/Clarity and form of Claims

§112 Breakdown – Primary Elements

- (a) In General. The specification shall contain
  - a ***written description*** of the invention
  - the manner and process of making and using it, in such full, clear, concise, and exact terms ***as to enable*** any person skilled in the art […] to make and use the same
  - the ***best mode*** contemplated by the inventor […] of carrying out the invention.
- Three separate and distinct elements
- Written Description and Enablement are independent
  - Having one does not implicitly mean you have the other…

§112 Breakdown – Up & Coming Elements

- (f) Element in Claim for a Combination. An element in a claim for a combination may be expressed
  - as a ***means or step for*** performing a specified ***function*** without the recital of structure […]
  - such claim shall be construed to ***cover the corresponding structure*** […] described in the specification and equivalents thereof.
- Typically thought of in the device/mechanical arts, but functional language may bring this forward in biotech

§112 Breakdown - Housekeeping

- (b) Conclusion. The specification shall conclude with
  - one or more claims ***particularly pointing out and distinctly claiming*** the subject matter which the *inventor or a joint inventor regards* as the invention.

- (c)-(e) Form & Dependency
  - For OUS practitioners, remember no “multiple-multiple” dependent Claims in the US

Is the Sky Falling?

- 2021 saw two major decisions in the §112 area

- Juno v. Kite
  - August 2021
  - Written Description

- Amgen v. Sanofi
  - February 2021
  - Enablement

Tip 1: Remove the Blinders – Seeing A Representative Number of Species

Tip 1: Representative Number of Species

- For early-stage technology, knowledge of which structures achieve a certain function may be limited → functional Claim to a genus
- Issue in Juno was whether two scFv constructs represented all CD19 scFvs.

- Hypothetical Claim:

A composition for reducing tumor burden, comprising:

an immune cell expressing an engineered receptor, the receptor comprising:

a tumor-binding domain that specifically targets a tumor ligand, and

a signaling domain,

wherein the tumor-binding domain is operably coupled to the signaling domain and upon binding to the tumor ligand, causes the signaling domain to activate the immune cell and induce cytotoxic effects against the tumor, thereby reducing tumor burden.

- Is there a representative number of species disclosed?

Putting the Tip Into Action!

- No set number of species (“I’ll know it when I see it”)
- Application preparation stage:
  - Consider experimental scope/resources – can additional antibodies be screened?
  - Consider computational or predictive approaches to generate additional species
    - Are there predictive key residues that are tightly tied to target binding?
    - Balance overinclusion with distinguishing effective from ineffective species
  - Aim to align the species available with the scope of the claimed genus
    - Disclose sub-genera as well – may be more successful at aligning species with smaller scope of target
    - Describe what the species are not – negative claim elements may be useful as well
    - Define the target, if possible, which may aid in defining a sub-genus. Is target phosphorylated, post-translationally modified, etc.
    - If a certain number of species is believed to be representative, explain why

Putting the Tip Into Action!

- Claim approaches:

A composition for reducing tumor burden, comprising:

~~an immune~~ T-cell expressing an engineered receptor, comprising:

a tumor-binding domain that is an scFv and has at least 98% sequence identity to SEQ ID NO: 20 specifically targets a tumor ligand, and

a CD3 zeta signaling domain,

wherein the tumor-binding domain is operably coupled to the signaling domain via a CD28 co-stimulatory domain and upon binding to the tumor ligand, causes the signaling domain to activate the ~~immune~~ T-cell and induce cytotoxic effects against the tumor, thereby reducing tumor burden.

- Genus is not all immune cells, but focused on T-cells
- Genus is not all binders of the ligand, but focused on scFv

Putting the Tip Into Action!

- Claim approaches:

A composition for reducing tumor burden, comprising:

~~an immune~~ CD-8+ T-cell expressing an engineered receptor, comprising:

a tumor-binding domain that is an scFv and specifically targets ~~a~~ tumor ligand tumor ligand X when tumor ligand X is phosphorylated at residues 7, 19, and 27 of SEQ ID NO. 100,

wherein the scFv comprises three heavy chain CDRs selected from SEQ ID NOs: 25-35,

herein the scFv comprises three light chain CDRs selected from SEQ ID NOs: 36-46

and

a CD3 zeta signaling domain,

wherein the tumor-binding domain is operably coupled to the signaling domain via a CD28 co-stimulatory domain and upon binding to the tumor ligand, causes the signaling domain to activate the ~~immune~~ CD-8+ T-cell and induce cytotoxic effects against the tumor, thereby reducing tumor burden.

- Genus is not all immune cells, but focused on T-cells
- Genus is not all binders of the ligand, but focused on scFv that bind a particular species of tumor ligand

Tip 2: Make the Connection – Establishing Common Structure and/or Function

Tip 2: Common Structure and/or Function

- Return to hypothetical functional Claim:

A composition for reducing tumor burden, comprising:

an immune cell expressing an engineered receptor, comprising:

a tumor-binding domain that specifically targets a tumor ligand, and

a signaling domain,

wherein the tumor-binding domain is operably coupled to the signaling domain and upon binding to the tumor ligand, causes the signaling domain to activate the immune cell and induce cytotoxic effects against the tumor, thereby reducing tumor burden.

- Is there a common structural feature, or shared function, allowing “visualization” of the members of the genus

Putting the Tip Into Action!

- Application preparation stage:
  - What structural similarities can be established?
    - Show/describe alignments of species, especially at key common regions
    - Identify key conserved positions among species
      - Is there a consensus sequence among functional species?
    - Establish commonality between the species to allow recognition of other members of the genus/sub-genus
      - E.g., “according to several embodiments, functional tumor-binding moieties have a heavy chain CDR3 of the following sequence”
  - What functional similarities can be established?
    - Show/describe shared binding characteristics
    - Show/describe shared signaling characteristics
    - If possible, establish nexus between the structure and the function

Putting the Tip Into Action!

- Claim approaches:

A composition for reducing tumor burden, comprising:

~~an immune~~ CD-8+ T-cell expressing an engineered receptor, comprising:

a tumor-binding domain that is an scFv and comprises a variable light chain having at least 98% identity one or more of SEQ ID NOs: 1-5 and a variable heavy chain having at least 98% identity one or more of SEQ ID NOs: 6-10 ~~specifically targets a tumor ligand~~, and

a CD3 zeta signaling domain,

wherein the tumor-binding domain is operably coupled to the signaling domain via a CD28 co-stimulatory domain and upon binding to the tumor ligand, causes the signaling domain to activate the ~~immune~~ CD-8+ T-cell and induce cytotoxic effects against the tumor, thereby reducing tumor burden.

- Defining common structure

Putting the Tip Into Action!

- Claim approaches:

A composition for reducing tumor burden, comprising:

~~an immune~~ CD-8+ T-cell expressing an engineered receptor, comprising:

a tumor-binding domain that is an scFv and is for specifically targeting ~~targets~~ a tumor cell expressing tumor ligand X, but does not bind non-tumor cells, and

a CD3 zeta signaling domain,

wherein the tumor-binding domain is operably coupled to the signaling domain and upon binding to the tumor ligand, causes the signaling domain to activate the ~~immune~~ CD-8+ T-cell and induce ~~cytotoxic effects against the tumor~~, one or more of:

- Release of perforin or granzyme B,
- Release of one or more of IL17, CCL5, interferon gamma, and TNF-alpha, and
- Binding of tumor cell expressed Fas by T-cell expressed Fas ligand, thereby reducing tumor burden.

- Defining common function

Putting the Tip Into Action!

- Outside the antibody/CAR scenario:

An artificial ligand for induction of calcium signaling in a cell, comprising:

a calcium channel-targeting moiety; and

a calcium channel-opening moiety operably coupled to the channel-targeting moiety,

wherein the channel-targeting moiety comprises a peptide suitable for interaction with an extracellular domain of a calcium channel on a cell,

wherein, upon binding of the channel-targeting moiety to the extracellular domain of the calcium channel, the channel-opening moiety undergoes a conformational change that results in opening of a pore in the calcium channel, thereby allowing calcium to pass through the pore, resulting in one or more of:

- Neurotransmitter release by the cell,
- Activation of one or more kinases in the cell, and/or
- Alterations in glucose metabolism by the cell.

Putting the Tip Into Action!

- Potential downsides of functional Claims
  - Do you run risk of slipping into means + function world?
    - as a means or step for performing a specified function without the recital of structure […] construed to cover the corresponding structure […] and equivalents thereof.
  - Established that the Claim need not use “means for”
  - Catch-22 – if you Claim by function, it is likely that you don’t have much structure in the specification, so scope may still be limited to 1 or 2 species.
- Compare with means + function in med-tech
  - Much simpler to disclose various means
  - Functions are perhaps more easily described

Tip 3: Take the “Un” Out of Unpredictable – Providing Enabling Disclosure

Tip 3: Take the “Un” Out of Unpredictable

- Still in the world of functional Claims, particularly for biological materials
- Amgen involved antibody claims that recited binding of the antibody to certain residues of the target in block a native ligand from binding that target
- Examiners (and courts) will aim to have the scope of the Claim in line with the specification – more species potentially equals more breadth
- Anticipate the “any _____” rejection.
  - If you demonstrate treatment of colon cancer, but your Claims are to “treating a tumor”

Tip 3: Take the “Un” Out of Unpredictable

- Application preparation stage:
  - What additional information can be disclosed?
    - The Amgen court didn’t say what it looks like, but indicated that patentees should constructively describe biological compositions “with procedures and names of resultant compositions” when the claims reach beyond compounds actually reduced to practice
  - Include methods of making, methods of testing, product by process, methods of screening
    - This could help fill the “undue experimentation” gap
  - Prophetic examples (perhaps later supported by post-filing data)
  - Consider including discussion of why/how those species reduced to practice/described could be extrapolated to broader concepts
- In the application (and prosecution) balance discussion of what routine or readily appreciated with potential obviousness trap

Putting the Tip Into Action!

- Return to hypothetical functional Claim:

  A composition for reducing tumor burden, comprising:

  an immune cell expressing an engineered receptor, comprising:

  a tumor-binding domain that specifically targets a tumor ligand, and

  a signaling domain,

  wherein the tumor-binding domain is operably coupled to the signaling domain and upon binding to the tumor ligand, causes the signaling domain to activate the immune cell and induce cytotoxic effects against the tumor.

- Each term in blue is subject to the "any _____" rejection.
- Leverage available disclosure with strategic focusing of these terms
  - Narrowing selected parts while keeping others broader
  - Often takes some time to determine what resonates with an Examiner
- Applicable in med tech as well

Tip 4: Appreciate the Double-edged Sword – Addressing §112 Has Potential Up Sides

Tip 4: All The Extra Work May Work For You

- Clearly a goal to obtain commercially relevant Claims
  - Antibodies, CARs, Devices, methods, etc.
  - Seek to cover direct infringers, but don't be myopic
    - The additional disclosure needed to address §112 may aid in obtaining Claims to cover alternative infringers
- In parallel (or series) consider
  - Claims to "adjunct" technologies (e.g., manufacturing/scale up)
  - Who is out there with a "tweak" to the commercial technology?
  - What's in the pipeline; how to evergreen the portfolio?
- Disclosure stage
  - Ask "now how could someone else do it?"
  - Integrate "hot" topics from patentability or landscape searches
- During prosecution
  - Leverage continuations/divisionals
  - Expedited programs

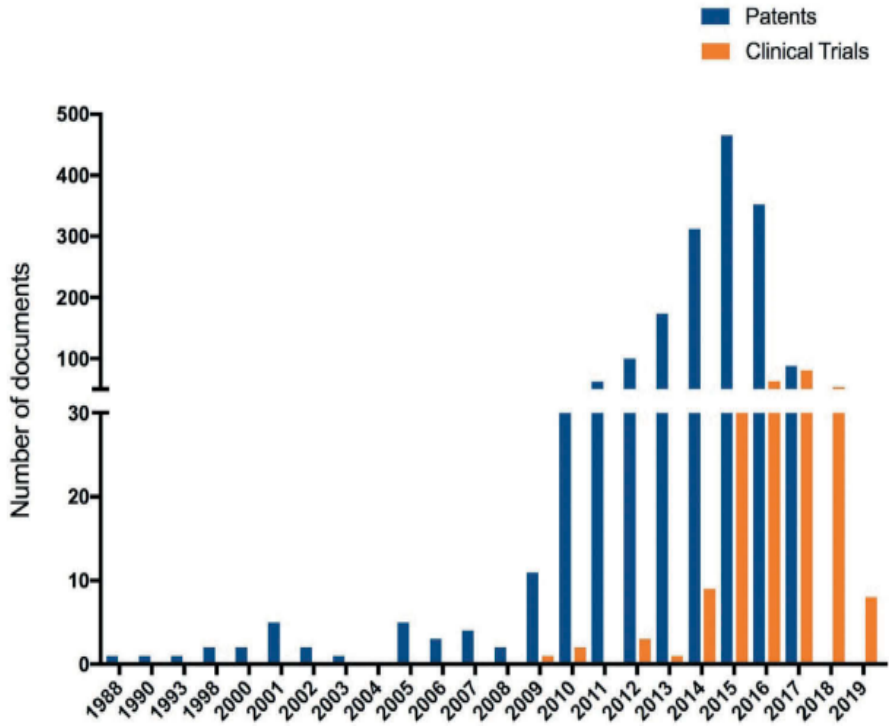
Tip 5: Recognizing When Enough Is (Hopefully) Enough

Tip 5: Recognizing When Enough Is (Hopefully) Enough

- Perfect is the enemy of good

- In thriving areas of technology, there is a “landgrab” mentality
  - Balance with Tips #1-#4

- Often dealing with inventors who:
  - Want to complete the story
  - Have data “right around the corner”
  - Think a patent is like a manuscript
  - Undertake numerous rounds of editing



Picano-Castro, et. al., Human Vaccines & Immunotherapeutics, Vol. 16(6), 1424 (2020)

Tip 5: Recognizing When Enough Is (Hopefully) Enough

- File early in the process
  - Do not need ***ALL*** the data for the first filing
  - Serial provisionals

    or
  - separate provisionals and selectively claim priority

- The financial costs tend to be much less than the value lost
  - Implement a “publications and conferences” calendar

- Days or weeks can make a huge difference in prior art landscape

- Watch your own publications! Filing before your PCT (or other application) publishes can change how your own past work will be treated as prior art

Crystal Ball Time – Where are we headed?

What Does The Future Hold?

- What will SC do with Amgen and/or Juno?
- Does this boil down to a cost issue?
  - Do you have to inject 1 mouse or 1000 mice?
- Do heightened standards for WD/enablement stifle innovation?
  - Is there reduced incentive to be the “groundbreaker”?
- Without heightened standards are the first-comers obtaining unhelpful monopolies over entire fields in biotech?
- What is potential for “bleed through” of heightened WD/enablement to other technical areas?
  - Will med-tech increased scrutiny as technology becomes more “unpredictable” (e.g., AI or machine-learning, biologic-based implants etc.)?

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Thank You!