ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

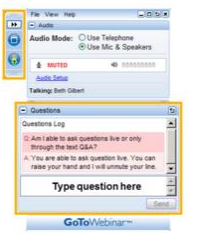
We will begin momentarily at 2pm ET

Slides available now! Recordings will be available to ACS members after one week.

www.acs.org/acswebinars

Have Questions?

ACS Chemistry for Life®



"Why am I muted?"
Don't worry. Everyone is muted except the presenter and host. Thank you and enjoy the show.

Type them into questions box!

Let's get Social…post, tweet, and link to ACS Webinars during today's broadcast!

ACS Chemistry for Life®

facebook.com/acswebinars

@acswebinars

LinkedIn Search for "acswebinars" and connect!

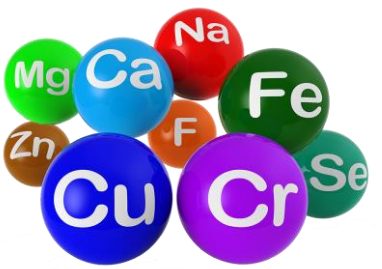
www.acs.org/acswebinars

3

ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

Have you discovered the missing element?



www.acs.org/2joinACS

Find the many benefits of ACS membership!

4

ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

Benefits of ACS Membership

C&EN
CHEMICAL & ENGINEERING NEWS

Chemical & Engineering News (C&EN)
The preeminent weekly news source.

ACS Presentations on Demand™
YOUR SOURCE FOR RECORDED MEETING CONTENT

NEW! Free Access to ACS Presentations on Demand®
ACS Member only access to over 1,000 presentation recordings from recent ACS meetings and select events.

NEW! ACS Career Navigator
Your source for leadership development, professional education, career services, and much more.

www.acs.org/2joinACS

How has ACS Webinars® benefited you?

ACS Chemistry for Life®

"I am a chemist, EHS professional, inventor, and entrepreneur. Last year, I patented one of my ideas and started a company. My product launch is forthcoming and I gained valuable insight from this ACS Webinar. I have, intuitively, been applying the concepts discussed and I see that more emphasis must be placed on flying the OODA loop and setting failure ratios. This was time well spent."

Fan of the Week
Shawn A. Coleman,
President/CEO
WEDJ Container

Be a featured fan on an upcoming webinar! Write to us @ acswebinars@acs.org

ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

7

ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

All recordings of ACS Webinars® will be available to current ACS members one week after the Live broadcast date.

Live weekly ACS Webinars® will continue to be available to the general public.

Upcoming ACS Webinars®

www.acs.org/acswebinars

Thursday, August 13, 2015

"**Science Communication Today:** Chemistry by Design"

Andy Brunning, Creator, Compound Interest

Adam Dylewski, Manager, ACS Reactions, ACS Productions

Thursday, August 27, 2015

"**Choices and Trends in Solid Dosage Form Section:** Salt, Cocrystal, Prodrug or Amorphous?"

Scott Trzaska, Principal Scientist, J-Star Research

Ronald Smith, Distinguished Scientist, Merck

Contact ACS Webinars ® at acswebinars@acs.org

9

Next Webinar in the ACS Fellows Program Series!

The American Chemical Society (ACSF) designation is awarded to a member who, in some capacity, has made exceptional contributions to the science or profession and has provided excellent volunteer service to the ACS community.

www.acs.org/content/acs/en/funding-and-awards/fellows.html

10

ACS Webinars
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

"Hot Topics in Patent Law:
Non-Obviousness of Chemical and Pharmaceutical Patents"

Justin Hasford
ACS Fellow and Partner,
Finnegan, Henderson, Farabow,
Garrett & Dunner

David Harwell
Asst. Director of Industry
Member Programs, ACS

Slides available now! Recordings will be available to ACS members after one week
www.acs.org/acswebinars

This ACS Webinar is co-produced with the ACS Fellows Program

11

"Hot Topics in Patent Law:
Non-Obviousness of Chemical and Pharmaceutical Patents"

ACS Webinars
Justin J. Hasford, Esq.
August 6, 2015

FINNEGAN

www.finnegan.com
Finnegan, Henderson, Farabow, Garrett & Dunner LLP

35 U.S.C. § 103

- Pre-AIA: "A patent may not be obtained though the invention is not identically disclosed or described [in the prior art] if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."
- Post-AIA: Shifts the relevant time to "before the effective filing date of the claimed invention" but otherwise is substantively similar to pre-AIA statute.

35 U.S.C. § 103

- Requires that the invention and prior art be considered from the perspective of a hypothetical ***person of ordinary skill in the art***
  - Objective standard that focuses on perceptions of ordinary scientists, not experts, inventors, laymen, lawyers or judges
- Mandates an obviousness determination ***at the time the invention was made***
  - Requires decision-makers to cast back objectively before the invention was known, not assess subjectively in the present
- Obviousness of ***claimed subject matter as a whole***, not just pieces of it and not just points of difference from the prior art, must be determined

35 U.S.C. § 103

- Statute requires consideration of "the" prior art, not just part of it
  - Prior art suggesting a path different from that followed by the inventor supports non-obviousness
- Statute specifically states that patentability shall not be negatived by the manner in which the invention was made
  - Inventor's own work, insight, expectations and approaches are not evidence of non-obviousness
- Statute imposes no requirement of "importance," "superiority" or "commercial value" as a condition of patentability
  - "Patents are not Nobel or Pulitzer Prizes." (Rich, Giles S.)

Pfizer v. Teva, 2012-1576, 1601-07 (Feb. 6, 2014)

- ANDA case involving Lyrica®, used for treating seizures and certain types of pain
  - Active ingredient is pregabalin, the S-enantiomer of 3-isobutylGABA (4-amino-3-(2-methylpropyl) butanoic acid)
- Claim 2: 4-amino-3-(2-methylpropyl) butanoic acid, or a pharmaceutically acceptable salt thereof
  - Claim not limited to the S-enantiomer

Pfizer v. Teva, 2012-1576, 1601-07 (Feb. 6, 2014)

- District Court (D. Del.; Sleet, J.) found that Defendants, which relied on three prior art references, failed to prove obviousness by clear and convincing evidence
- Prior art did not direct a skilled artisan to select 3-isobutylGABA for its anticonvulsant activity
  - No teaching to substitute alkyl groups at 3-position of gamma aminobutyric acid (GABA)

Pfizer v. Teva, 2012-1576, 1601-07 (Feb. 6, 2014)

- Defendants' arguments:
  - The three prior art references taught that 3-isopropylGABA and other homologous compounds may have anticonvulsant activity
  - One of skill would have expected 3-isobutylGABA to have anticonvulsant activity due to its structural similarities to 3-isopropylGABA
  - Gabapentin, a 3-alkylGABA compound in the prior art with demonstrated anticonvulsant efficacy, provided a motivation for one of skill to try other alkyl substituents at GABA's 3-position

Pfizer v. Teva, 2012-1576, 1601-07 (Feb. 6, 2014)

- Federal Circuit (Prost, Rader and Moore) affirmed
- Scant evidence that either gabapentin or 3-isopropylGABA would have been selected as a lead compound for further development
  - "Mere structural similarity between a prior art compound and the claimed compound does not inform the lead compound selection."
  - "A patent challenger . . . must demonstrate the selection of a lead compound based on its 'promising useful properties,' not a hindsight-driven search for structurally similar compounds."

Pfizer v. Teva, 2012-1576, 1601-07 (Feb. 6, 2014)

- Defendants also failed to identify prior art teachings to make specific molecular modifications so that the claimed compound may be made with a reasonable expectation of success
  - Prior art disclosed trillions of compounds without singling out isobutyl groups specifically
  - "[A] vague suggestion in the prior art pointing to a broad class of compounds, without any teaching particularly identifying isobutyl among the millions of potential compounds, is not a teaching of 'specific molecular modifications' required by our precedent."

Cadence v. Exela, No. 2014-1184 (Mar. 23, 2015)

- ANDA case involving Ofirmev® injectable acetaminophen product for treatment of pain
  - In aqueous solution, acetaminophen decomposes into potentially toxic products
    - Acetaminophen degrades primarily by hydrolysis
  - Cadence's '218 patent discloses and claims methods for obtaining stable acetaminophen formulations by deoxygenating solutions with an inert gas to achieve oxygen concentrations below 2 ppm
    - Superior stability results as compared to those reported in Cadence's prior art '222 patent

Cadence v. Exela, No. 2014-1184 (Mar. 23, 2015)

- Exela contended '218 patent was obvious over '222 patent.
  - Parties agreed that only difference between '218 patent claims and '222 patent is that '222 patent does not disclose decreasing oxygen content below 2 ppm
  - '222 patent discloses that stability of acetaminophen solutions depends, inter alia, on "removal of oxygen dissolved in the carrier"
  - Prior art Palmieri article teaches that deoxygenating pyrogallol solutions to below 5 ppm increases stability

Cadence v. Exela, No. 2014-1184 (Mar. 23, 2015)

- District Court (D. Del.; Stark, J.) rejected Exela's obviousness arguments
  - No motivation to combine '222 patent and Palmieri article, because pyrogallol degrades by oxidation whereas acetaminophen degrades by hydrolysis
  - Deoxygenation to levels below 2 ppm was "technically difficult."
  - Secondary considerations of unexpected results, long-felt need, commercial success, licensing and praise in the industry supported non-obviousness

Cadence v. Exela, No. 2014-1184 (Mar. 23, 2015)

- Federal Circuit (Linn, Reyna and Wallach) affirmed
  - Rejected Exela's argument that acetaminophen breaks down first by oxidation, followed by hydrolysis
    - Inventor testified at trial that he performed experiments confirming that acetaminophen degraded by hydrolysis
    - Cadence's expert testified that, consistent with prior art teaching, acetaminophen degrades primarily by hydrolysis
    - Dr. Palmieri admitted at trial that deoxygenation would not be effective to prevent hydrolytic degradation
  - Not obvious to combine '222 patent with Palmieri article
    - Address different problems: oxidation vs. hydrolysis
  - Examiner initially rejected '218 patent claims for essentially the same reasons, which Applicant overcame

Cadence v. Exela, No. 2014-1184 (Mar. 23, 2015)

- Federal Circuit (Linn, Reyna and Wallach) affirmed
  - Secondary considerations supported non-obviousness
    - Nexus between Ofirmev® and claims exists even though solvent is deoxygenated prior to addition of API
      - Insubstantially different from deoxygenating after addition of API
    - Unexpected results: formulations of '218 patent were stable for 2 years, whereas formulations of '222 patent only achieved a few months' stability
    - Separate licensing of '218 patent evidences a belief that the '218 patent claims are valid

Insite v. Sandoz, No. 2014-1065 (Apr. 9, 2015)

- ANDA case involving Azasite® topical azithromycin solution used to treat conjunctivitis
- Covered by '411 patent and three "ISV patents"
  - '411 patent is directed to methods of treating eye infections by topical administration of azithromycin to the eye
    - Azithromycin was a common oral antibiotic but was not known to be effective for topical ocular administration
  - ISV patents are directed to formulations of azithromycin in a polymeric suspending agent for topical ophthalmic use
    - Azithromycin was considered insoluble and unstable in water

Insite v. Sandoz, No. 2014-1065 (Apr. 9, 2015)

- District Court (D.N.J.; Cooper, J.) rejected Sandoz's obviousness arguments
  - Proper obviousness inquiry is whether it would have been obvious to develop a topical ophthalmic formulation containing azithromycin, not whether it would have been obvious to use topical azithromycin to treat conjunctivitis
  - '411 patent is not an obvious modification of Ilotycin® topical erythromycin formulation and Zithromax® oral azithromycin formulation for treating conjunctivitis
  - ISV patents are not obvious: no motivation to use water-based polymeric solutions of prior art because azithromycin was insoluble and unstable in water, and if anything a skilled artisan would have used a colloidal system not a gelling polymer

Insite v. Sandoz, No. 2014-1065 (Apr. 9, 2015)

- Federal Circuit (Linn, Prost and Newman) affirmed
  - District Court did not err in defining the problem broadly
    - "In considering motivation in the obviousness analysis, the problem examined is not the specific problem solved by the invention."
    - "Defining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness."
    - "[A]n overly narrow statement of the problem can represent a form of prohibited reliance on hindsight, because often the inventive contribution lies in defining the problem in a new relevatory way."

Insite v. Sandoz, No. 2014-1065 (Apr. 9, 2015)

- District Court did not err in defining the problem broadly
  - Azithromycin's characteristics, including that it was known to be bacteriostatic, have limited spectrum of activity and require multiple doses per day, made it a poor choice for treating ocular infections
  - Unique balance of log P, molecular weight, solubility and charge also made azithromycin "not a good candidate"
  - Plaintiffs' expert testified that treatment of conjunctivitis requires penetration into cornea because conjunctival infections can spread into cornea

Insite v. Sandoz, No. 2014-1065 (Apr. 9, 2015)

- District Court did not err in finding '411 patent non-obvious
  - There were "innumerable" options for ophthalmic treatments, including fluoroquinolones
    - Better option than azithromycin because azithromycin's high molecular weight, charge and insolubility in water would lead to penetration problems
  - No correlation between oral and ophthalmic penetration, because oral azithromycin is delivered by phagocytosis, which is a bloodstream-dependent process
  - Defendants' own expert was inventor on 1994 patent for ophthalmic treatments listing 24 potential antibiotics, none of which was azithromycin

Insite v. Sandoz, No. 2014-1065 (Apr. 9, 2015)

- District Court did not err in finding ISV patents non-obvious
  - Sandoz relied on Insite's prior art Durasite® drug delivery system patent, which mentions erythromycin and polycarbophil, arguing that erythromycin could be replaced with azithromycin to yield ISV claimed subject matter
    - But Durasite® patent discloses a "laundry list of active ingredients" and researchers would focus on examples, none of which mentions erythromycin
    - Skilled artisan still would need to change erythromycin to azithromycin, which would not have been obvious given azithromycin's poor solubility and stability in water
  - Sandoz also relied on '411 patent, but Carbopol disclosed in '411 patent is significantly different from polycarbophil of ISV patents

Insite v. Sandoz, No. 2014-1065 (Apr. 9, 2015)

- District Court did not err in evaluating secondary considerations
  - Unexpected results
    - 60-fold increase in concentration of azithromycin when dosed topically as opposed to orally
    - Sandoz argued that some increase in concentration was to be expected
    - But Sandoz failed to show that a 60-fold increase was expected
  - Long-felt need
    - Azasite® met a long-felt need for a topical treatment for eye infections, which Sandoz failed to rebut

Disclaimer

These materials are public information and have been prepared solely for educational purposes to contribute to the understanding of American intellectual property law. These materials reflect only the personal views of the author and are not individualized legal advice. Each case is fact-specific, and the appropriate solution in any case will vary. These materials therefore may not be relevant to any particular situation. Accordingly, the author and Finnegan, Henderson, Farabow, Garrett and Dunner, L.L.P. cannot be bound either philosophically or as representatives of their various past, present and future clients to the comments expressed in these materials. The presentation of these materials does not establish any form of attorney-client relationship with the author or Finnegan, Henderson, Farabow, Garrett and Dunner, L.L.P. While every attempt was made to ensure that these materials are accurate, errors or omissions may be contained therein, for which any liability is disclaimed.

Questions

Justin J. Hasford
Finnegan, Henderson, Farabow, Garrett & Dunner, LLP

901 New York Avenue, NW
Washington, DC 20001
justin.hasford@finnegan.com

P: (202) 408-4175
F: (202) 408-4400

ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

"Hot Topics in Patent Law:
Non-Obviousness of Chemical and Pharmaceutical Patents"

Justin Hasford
ACS Fellow and Partner,
Finnegan, Henderson, Farabow,
Garrett & Dunner

David Harwell
Asst. Director of Industry
Member Programs, ACS

Slides available now! Recordings will be available to ACS members after one week
www.acs.org/acswebinars

This ACS Webinar is co-produced with the ACS Fellows Program

Upcoming ACS Webinars®
www.acs.org/acswebinars

ACS Chemistry for Life®

Thursday, August 13, 2015

"**Science Communication Today:** Chemistry by Design"

Andy Brunning, Creator, Compound Interest
Adam Dylewski, Manager, ACS Reactions, ACS Productions

Thursday, August 27, 2015

"**Choices and Trends in Solid Dosage Form Section:** Salt, Cocrystal, Prodrug or Amorphous?"

Scott Trzaska, Principal Scientist, J-Star Research
Ronald Smith, Distinguished Scientist, Merck

Contact ACS Webinars ® at acswebinars@acs.org

ACS Webinars®
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

"Hot Topics in Patent Law:
Non-Obviousness of Chemical and Pharmaceutical Patents"

Justin Hasford
ACS Fellow and Partner,
Finnegan, Henderson, Farabow,
Garrett & Dunner

David Harwell
Asst. Director of Industry
Member Programs, ACS

Slides available now! Recordings will be available to ACS members after one week
www.acs.org/acswebinars

This ACS Webinar is co-produced with the ACS Fellows Program

37

How has ACS Webinars® benefited you?

ACS Chemistry for Life®

"I am a chemist, EHS professional, inventor, and entrepreneur. Last year, I patented one of my ideas and started a company. My product launch is forthcoming and I gained valuable insight from this ACS Webinar. I have, intuitively, been applying the concepts discussed and I see that more emphasis must be placed on flying the OODA loop and setting failure ratios. This was time well spent."

Fan of the Week
Shawn A. Coleman,
President/CEO
WEDJ Container

Be a featured fan on an upcoming webinar! Write to us @ acswebinars@acs.org

38

ACS Webinars
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

39

ACS Webinars
CLICK • WATCH • LEARN • DISCUSS

ACS Chemistry for Life®

Benefits of ACS Membership

Chemical & Engineering News (C&EN)
The preeminent weekly news source.

NEW! Free Access to ACS Presentations on Demand®
ACS Member only access to over 1,000 presentation recordings from recent ACS meetings and select events.

NEW! ACS Career Navigator
Your source for leadership development, professional education, career services, and much more.

www.acs.org/2joinACS

40

ACS Webinars® does not endorse any products or services. The views expressed in this presentation are those of the presenter and do not necessarily reflect the views or policies of the American Chemical Society.

Upcoming ACS Webinars®

www.acs.org/acswebinars

Thursday, August 13, 2015

"**Science Communication Today:** Chemistry by Design"

Andy Brunning, Creator, Compound Interest
Adam Dylewski, Manager, ACS Reactions, ACS Productions

Thursday, August 27, 2015

"**Choices and Trends in Solid Dosage Form Section:** Salt, Cocrystal, Prodrug or Amorphous?"

Scott Trzaska, Principal Scientist, J-Star Research
Ronald Smith, Distinguished Scientist, Merck