UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 6,423,327

DECLARATION OF R. RANDALL WICKETT, PH.D.

L'OREAL USA, INC. EX. 1010

TABLE OF CONTENTS

I, R. Randall Wickett, Ph.D., declare as follows:

1. The opinions set forth below are based on my over 40 years of experience as an expert in formulating and testing skin care products, including topical cosmetic compositions, and on the review of materials discussed herein.

I. BACKGROUND AND QUALIFICATIONS

2. My *curriculum vitae* ("CV") (a copy of which is attached) highlights my education, experience, and qualifications as an expert in formulating and testing skin care products, including topical products. Some of the information relevant to this case is summarized below.

3. I received my Bachelor of Arts in Chemistry in 1968 from Western Washington State College. I received a Ph.D. in Biophysics from the Department of Biochemistry and Biophysics at Oregon State University in 1973. I was a postdoctoral fellow at the University of Minnesota, Minneapolis in the Department of Chemistry from 1972-1974, where I studied protein conformational dynamics.

4. I worked in the Cosmetics and Personal Care industry from 1974 to 1991, first at Procter and Gamble in Cincinnati, Ohio from 1974 to 1985 and then at S.C. Johnson Wax in Racine, Wisconsin until 1991. I performed research on skin and hair care products at both of these companies.

5. Since 1991, I have had an extensive consulting practice in which I have performed consulting and training for cosmetic and pharmaceutical companies, including Procter and Gamble, DuPont, Estee Lauder, 3M, Unilever, Clairol, Pfizer, Wyeth Consumer Products, Hill Top Research, Bioscreen and many others.

6. I am currently Emeritus Professor of Pharmaceutics and Cosmetic Science, University of Cincinnati, College of Pharmacy. I joined the University of Cincinnati, College of Pharmacy as Associate Professor of Pharmaceutics and Cosmetic Science in 1991 and was promoted to Professor of Pharmaceutics and Cosmetic Science in 1998. In that capacity I teach graduate classes on cosmetic science including, among other topics, skin care science. The Cosmetic Science Program at the University of Cincinnati is one of the few graduate programs in the United States offering a M.S. or Ph.D. degree in pharmaceutical sciences with emphasis in cosmetic science.

7. I have given more than 100 invited lectures and taught classes and workshops in the United States and abroad, including in Thailand, Taiwan, Israel, South Africa, Brazil, Argentina, Guatemala, Chile, Scotland, Estonia, South Korea, The Netherlands, Germany, Russia, Romania, Canada and France. The lectures and classes covered topics on various aspects of cosmetic science and cosmetic product technology.

8. I was elected as a fellow of the Society of Cosmetic Chemists in 1996. I served as the Editor of the Journal of the Society of Cosmetic Chemists from 1991 to 1997 and as the Chairman of the International Society for Bioengineering and the Skin from 2000-2005. I was President of the Society of Cosmetic Chemists in 2011 and am currently chairman of the International Society for Stratum Corneum Research.

9. I have received numerous technical awards from the Society of Cosmetic Chemists including the Maison G. deNavarre Medal Award, the Society's highest honor, awarded to me in 1997 for technical contributions to cosmetic science. I was appointed an International Corresponding Member of the Chilean Academy of Pharmaceutical Sciences, August 7, 2009.

10. I have more than 100 scientific publications. My research has included making and testing all manner of cosmetics and personal care products. Publications that I have authored or co-authored within the preceding ten years are listed on my curriculum vitae.

11. I am a named inventor on four United States patents and two European patents.

12. Of particular relevance to this matter, I have evaluated transdermal delivery systems. I have also researched ingredients to enhance topical penetration of pharmaceutical compositions.

II. PRIOR TESTIMONY

13. I have testified as an expert in several cases, including: *International Flora Technologies, Inc. v. Desert Whale Jojoba Company, Inc.* (TTAB Cancellation Proceeding No. 92048012) (deposition); *Shen Wei (USA), Inc. et al. v. Sempermed, Inc.* (N.D. Ill.) (deposition); *International Flora Technologies, Inc. v. Desert Whale Jojoba Company, Inc.* (TTAB Cancellation Proceeding No. 92045327) (deposition); and *Laboratory Skin Care, Inc., and Zahra Mansouri v Limited Brands, Inc. and Bath & Body Works Inc.* (D.Del.) (deposition and trial testimony);and *Bayer Healthcare Pharmaceuticals, inc v. River's Edge Pharmaceuticals, LLC, et al.* Case No. 1:11-cv-01634-LMM (by deposition).

14. I have also testified before the National Advertising Division (NAD) of the Council of Better Business Bureaus and Federal Trade Commission on claim support matters.

15. I also provided testimony in L'Oréal USA, Inc., v. Liqwd, Inc., PGR2018-00023, PGR2018-00024, PGR2018-00025.

III. COMPENSATIONAND RELATIONSHIP TO THE PARTIES

16. I am being compensated at an hourly rate of $400 for the time I spend studying materials and issues associated with this matter and for the time I spend providing testimony. This rate is my standard consulting rate. My compensation is not contingent upon the outcome of this matter.

17. It is my understanding that University of Massachusetts is the assignee of the ‘327 patent. Prior to this matter, I have not worked for University of Massachusetts, and am aware of no financial interest that I have in the University of Massachusetts.

IV. MATERIALS CONSIDERED

18. I have reviewed U.S. Patent No. 6,423,327, as well as the file history thereof. I have also reviewed the documents listed in the following table:

Exhibit No.	Description
1001	**U.S. Patent No. 6,423,327 to Dobson *et al.***
1002	**U.S. Patent No. 6,645,513 to Dobson *et al.***
1004	**Certified Translation of DE 198459107 with Affidavit attesting to accuracy under 37 CFR 42.63(b)**
1006	**Certified Translation of JP-H-09-157153 with Affidavit attesting to accuracy under 37 CFR 42.63(b)**
1007	**U.S. Patent No. 5,091,182 to Ong *et al*.**
1009	**File History of U.S. Patent No. 6,423,327**

1012	**PCT Publication WO1996014822A1 Porter *et al.***
1013	**U.S. Patent No. 6,316,012 to N'Guyen *et al.***
1016	**Robert J. Scheuplein, *Permeability of the Skin: A Review of Major Concepts and Some New Developments*, 67 J. INVESTIGATIVE DERMATOL. 672, 672-76 (1976).**
1017	**Karen A. Holbrook & George F. Odland, *Regional Differences in the Thickness (Cell Layers) of the Human Stratum Corneum: An Ultrastructural Analysis* , 62 J. Investigative Dermatol. 415, 415-22 (1974).**
1018	**C. Lotte et al., *In vivo relationship between transepidermal water loss and percutaneous penetration of some organic compounds in man: effect of anatomic site*, 279 Arch Dermatol Res 351, 351-6 (1987).**
1019	**R H. Koizumi et al., *Adenosine Deaminase in Human Epidermis from Healthy and Psoriatic Subjects*, 275 Arch Dermatol Res 310, 310-14 (1983).**
1020	**P. Singh & M.S. Roberts, *Skin Permeability and Local Tissue Concentrations of Nonsteroidal Anti-Inflammatory Drugs after Topical Application*, 268 J. Pharmacol. Exp. Ther 144, 144-51 (1994).**
1021	**Gary L. Grove et al., *Use of nonintrusive tests to monitor age-associated changes in human skin*, 32 J. Soc. Cosmet. Chem. 15, 15-26 (1981).**

A. Relevant Law:

19. Although I am not a lawyer, I have been advised on certain relevant legal principles that I accept for the purpose of my analysis. Specifically, I am informed that 35 U.S.C. § 102 governs the determination of anticipation and that 35 U.S.C. § 103 governs the determination of obviousness. These are outlined below.

i. Anticipation

20. It is my understanding that for a patent claim to be invalid as anticipated in the context of an Inter Partes Review, it must be shown by a preponderance of the evidence ("more likely than not") that all limitations of the claim are disclosed in a single prior art reference, either expressly or inherently.

21. A claim limitation is inherent in the prior art if it is necessarily present in the prior art reference. This can occur, for example, (1) when the natural result flowing from an express disclosure in the prior art would result in the performance of the inherent feature, even if that result would not have been appreciated by a skilled artisan at the time of the invention; or (2) in situations where the common knowledge of technologists is not recorded in the reference, such as where technological facts are known to those in the field of the invention but not to lay persons.

22. A prior art reference does not need to anticipate every possible embodiment within the scope of the claim; it anticipates if it discloses an embodiment that is within the scope of the claim.

23. Anticipation does not require actual performance of the teachings of a reference, nor are the anticipatory disclosures of a prior art reference limited to the reference's preferred embodiments. Anticipation requires only that the reference describe the claimed invention in a manner to have placed the public in possession of it. Such possession is achieved if a skilled artisan at the time of the invention could have combined the reference's description of the invention with his own knowledge to make the claimed invention without undue experimentation.

ii. Obviousness

24. It is my understanding that in order to invalidate a patent claim as obvious in the context of an *Inter Partes* Review, it must be shown by a preponderance of the evidence that the claim would have been obvious to a skilled artisan at the time the invention was made. The prior art does not need to render obvious every possible embodiment within the scope of the claim. Rather, the prior art renders the claim obvious if the combined teachings disclose an embodiment that is within the scope of the claim. In determining whether a patent claim is invalid because of obviousness, one must consider the scope and content

of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art.

25. I am also informed that obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so; and that a reasonable expectation of success in achieving the subject matter of the claim at issue must also be shown. Further, I am informed that the teaching, suggestion or motivation test is flexible and that an explicit suggestion to combine the prior art is not necessary—the motivation to combine may be implicit and may be found in the knowledge of one of ordinary skill in the art, from the nature of the problem to be solved, market demand, or common sense.

26. A prior art reference is pertinent to the obviousness analysis if it discloses information designed to solve the same problems faced by the patent's inventors or if the reference discloses information that has obvious uses beyond its main purpose that a skilled artisan would reasonably examine to solve the same problems faced by the inventors.

27. In undertaking an obviousness analysis, I also understand that I may take into account the inferences and creative steps that a skilled artisan would have employed in reviewing the prior art at the time of the invention. If the claimed invention combines elements known in the prior art and the combination yields

results that would have been predictable to a skilled artisan at the time of the invention, then this evidence would make it more likely that the claim was obvious.

B. Person of Ordinary Skill in the Art

28. A person having ordinary skill in the art (POSITA or skilled artisan) at the time of the alleged invention for the '327 patent (in 1998 up to and including the October 26, 1998 filing date of the '006 application) would have a Bachelor's degree in Biochemistry or Chemistry with some academic exposure to, or industry courses or research in, topical delivery of drugs or cosmetic ingredients.

C. Claim Construction

29. I understand that in the context of an *Inter Partes* Review, the Patent Trial and Appeal Board of the USPTO is charged with applying the "broadest reasonable interpretation" of the claims "consistent with the specification," and that the claim language should read in light of the specification as it would be understood by a skilled artisan at the time of the invention. However, I am informed that the '327 patent will expire in October 2018, which may be prior to the conclusion of a proceeding based on the Petition. Thus, I have been asked to consider the claims using a more narrow standard: that claims are generally given their ordinary and customary meaning in light of the specification, which is the meaning that the term would have to a person of ordinary skill in the art in

question at the time of the invention, i.e., as of the effective filing date of the patent application. I am informed that the file history is to be considered and that arguments and statements made during the prosecution of the patent application can inform a skilled artisan of the meaning of the claims. In reaching my conclusions expressed below, I have interpreted the challenged claims consistent with these standards and requirements. I further note that my opinions below would not change under either the BRI or narrower standard.

i. "wherein the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M"

30. Claim 1 of the '327 patent recites that "the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M." For the reasons that follow, it is my opinion that term "wherein the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M" would have been interpreted by a skilled artisan in October 1998 to mean "the concentration of adenosine in the composition that is topically applied to the unbroken epidermal layer of a region of the skin containing the dermal cells is 10^{-4} M to 10^{-7} M (i.e., 0.00265 wt% to 0.00000265 wt %)[1]."

1 During prosecution, the inventors of the '327 patent submitted a declaration asserting that a concentration of adenosine of 10^{-4} M corresponded to 0.00265 wt%. (Ex. 1009, at 91). Thus, the claimed range of 10^{-4} M to 10^{-7}M corresponds to a range of 0.00000265 to 0.00265 wt %.

31. Skin is comprised of many layers, including an outer, epidermal layer, which covers multiple inner layers (including the dermal layers). (Ex. 1001, col. 1, ll. 19-20). I note that '327 patent describes the skin as having "a surface layer, known as the epidermis, and a deeper connective tissue layer, known as the dermis." (*Id.*) Further, the '327 patent discloses that the "dermis is composed of a variety of cell types, including fibroblasts." (*Id.*) Thus, a skilled artisan would have understood that dermal fibroblasts are covered by the outer, epidermal layer of the skin. (*Id.*)

32. I note that claim 1 requires topical application to "unbroken skin." Thus, a skilled artisan would have understood that because the epidermal layer is "unbroken," the dermal layer is not exposed, and adenosine cannot be directly applied to dermal cells located in the dermal layer through a topical application. Rather, the adenosine concentration would necessarily be applied to the epidermal layer (i.e., the outermost layer of the skin). The top layer of the epidermis, the Stratum Corneum (SC) is a significant barrier to the ingress of exogenous chemicals to the skin. (Ex. 1016). Accordingly, a skilled artisan would not have understood the limitation "the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M" to mean a direct application of the concentration of adenosine to dermal cells. I note that there is no disclosure in the '327 patent regarding direct ***topical*** application of adenosine to dermal cells. In fact, direct application to the

dermal cells would require intradermal methods of application, which the '327 patent distinguishes from topical application. (Ex. 1001, col. 5, ll. 12-29). Further, the '327 patent discloses *ex vivo* administration of adenosine to dermal cell cultures. (Ex. 1001, col. 1, ll. 37-39; col. 2, ll. 9-13). However, a skilled artisan would have understood that administration of adenosine to *ex vivo* cultures is not topical application of adenosine to unbroken skin. Thus, a skilled artisan would have understood that topical application to unbroken skin requires a topical application to the epidermal layer of the skin.

33. Regarding the concentration of adenosine in the claims, I have reviewed the prosecution file history for the '327 patent and note that the Patent Owner added the limitation "the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M" and made arguments to overcome prior art references. In particular, the Patent Owner argued that adenosine concentration of the prior art ***composition*** of Hartzshtark (i.e., 0.1%) was outside the scope of the claimed range of 10^{-4} M to 10^{-7} M. (Ex. 1009, 83-87). Thus, based on Patent Owner's arguments, a skilled artisan would have understood that the claimed concentration of adenosine is the amount in the ***composition*** that is topically applied, and not an amount that reaches the dermal cells.

34. Further, in my opinion, an interpretation that the claimed concentration is the concentration that reaches the dermal cells is incorrect. In

1998, a skilled artisan would have understood that it was not possible to calculate with any reasonable certainty an amount of adenosine that reaches the dermal cells when topically applied in view of the numerous variables that would need to be identified and factored into any such calculation. For example, a skilled artisan would have understood that the following is a non-exclusive list of variables that would influence any such calculation: the thickness of the stratum corneum, the condition of the skin, the age of the skin, the vehicle in which the adenosine is applied, the manner in which the adenosine is applied, the area in which it is applied, the time it left on the skin, etc. (Ex. 1017). Some of these factors are recognized in the '327 patent without any indication as to how they would affect the claimed concentration of adenosine. (Ex. 1001, col. 5, lines 30-35). In addition, several of these factors vary depending on the part of the body on which the composition is applied (e.g., elbow, foot, forehead, etc.). This is because the stratum corneum layer is thicker and less permeable on some portions of the body than others. (Ex. 1018). In addition, a skilled artisan would have been aware that many of these factors vary from individual to individual. (Ex. 1017). Further, a skilled artisan would have known that adenosine may metabolize in the epidermis prior to reaching the dermis. (Ex. 1019). A skilled artisan would have also known that the upper part of the dermis contains a network of small capillaries that

transport substances that have penetrated the epidermis into the blood stream. Attempting to account for capillary clearance is extremely complex.(Ex. 1020)

35. I note that the '327 patent does not provide any guidance or suggestion as to how such a calculation or measurement of the actual concentration reaching the "dermal cells" could be done. Thus, in view of Patent Owner's arguments distinguishing the claimed concentration over concentrations in the compositions of the prior art, and the general knowledge of a skilled artisan in 1998, it is my opinion that the only way the claimed concentration would make any sense (i.e., be capable of being determined) is the claimed concentration of adenosine is the amount in the composition that is topically applied, and not an amount that reaches the dermal cells.

36. In view of the foregoing, it is my opinion that the term "the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M" should be interpreted to mean ***the concentration of adenosine in the composition that is topically applied to the unbroken epidermal layer of a region of the skin containing the dermal cells is 10^{-4} M to 10^{-7} M*** (i.e., 0.00265 to 0.00000265 wt %).

V. CLAIMS 1, 3, 5-7, AND 9 OF THE '327 PATENT ARE NOT NOVEL IN VIEW OF DE '107

37. DE'107 discloses cosmetic compositions containing adenosine for care and prevention of signs of aging of the skin. (Ex. 1003, p. 1, ll. 1-39).

Specifically, DE'107 teaches that the adenosine compositions can be applied to the skin to treat damage resulting from aging, such as wrinkling and drying out of the skin. (*Id.*, ll. 20, 29.) DE'107's compositions contain adenosine in an amount ranging from 0.001% to 10% by weight. (Id., p. 14, ll. 17-20.)

Claim 1

38. Claim 1 is not novel in view of DE '107. Specifically, I note that DE '107 discloses cosmetic compositions, where the compositions contain adenosine in an amount ranging from 0.001% to 10%, by weight. DE '107 also discloses application of the compositions to the skin for treatment of skin conditions such as dryness. The following Table 1 summarizes where each element of claim 1 of the '327 patent is found in DE '107:

TABLE 1	
1. A method for ***enhancing the condition of unbroken skin***	DE '107 discloses a cosmetic product for the prevention and therapy of cosmetic or dermatological skin changes such as, for example, skin aging. (Ex. 1004, p. 1, lines 3-9) DE '107 discloses cosmetic processes for protection of the skin against oxidative and photoxidative processes. (Ex. 1004, p. 14, lines 10-15) DE '107 does not disclose the treatment of wounds or broken skin, so a skilled artisan would understand DE '107 to include treatment of unbroken skin.
of a ***mammal***	DE '107 discloses application to human skin. (Ex. 1004, p. 2, lines 1-4)
by reducing one or more of wrinkling, roughness, ***dryness***, or laxity of the skin,	"(d) Limited regenerative turnover in the epidermis in conjunction with abnormal formation of the horny layer (hornification) that leads to drying out of the skin." (Ex. 1004, p. 1, lines 27-29).
without increasing ***dermal cell proliferation***,	***Discussed below—inherently disclosed***
the method comprising ***topically*** ***applying to the skin***	DE '107 discloses cosmetic compositions for topical application. (Ex. 1004, p. 2, line 30 to p. 3, line 5, Examples 1-6).

a composition comprising a concentration of adenosine in an amount effective to enhance the condition of the skin without increasing dermal cell proliferation, wherein the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M.	DE '107 discloses cosmetic compositions for topical application containing an amount of adenosine ranging from 0.001% to 10%: "According to the use as described in the invention, cosmetic or dermatological formulations can be composed as usual and used for the treatment, care and cleansing of the skin and/or hair, and as a make-up product in decorative cosmetics. **They contain preferably 0.001 percent by weight to 10 percent by weight, in particular 0.01 percent by weight to 6 percent by weight,** of the active substance combinations relative to the total weight of the product." (Ex. 1004, at p.2, line 28 to p. 3, line 5, emphasis added). "The present invention also includes a cosmetic method of protecting the skin and the hair against oxidative and photo-oxidative processes, which is characterized in that a cosmetic composition; which contains an effective concentration of adenosine, in a sufficient **amount is applied to the skin** or hair. **Preferably, the amount of adenosine in these preparations 0.001 wt.% to 10 wt.%,** more preferably 0.01 wt.% to 6 wt.%, based on the gross weight of the preparations." (Ex. 1004, at p. 14, lines 10-20, emphasis added).

39. In my review of the file history of the '327 patent, I note that the Examiner rejected certain claims of the application as anticipated by DE '107. The Examiner stated that DE '107 rendered the claims not novel because it "discloses a cosmetic and dermatological preparation containing adenosine for the treatment of natural, chemical induced or UV induced skin aging and its sequelae." (Ex. 1009, p. 74).

40. In response, the inventors amended the claims to specify the adenosine concentration range of 10^{-4}M to 10^{-7}M, and submitted a Declaration describing testing of adenosine at 10μM (10^{-5}M) and 100μM (10^{-4}M) on human fibroblasts in culture. (Ex. 1009, p. 81-92 and 107-111). The results of the testing concluded that there was no proliferation of the fibroblasts. (*Id.*)

41. Therefore, the inventors argued to the Examiner that DE '107 "must be mistaken" in its disclosure that the range of 0.001% to 10% by weight increases "cell" proliferation. (Ex. 1009, at p. 89-92 and 107-111). Specifically, the inventors argued that their test results showed that "low concentrations of adenosine do not increase dermal cell proliferation," supposedly contrary to DE '107's disclosure. (*Id.*) It is important to note, however, that the data the inventors submitted was limited to fibroblasts, which are only one of the cell types in the skin in addition to other cells in the epidermal, dermal, and sub-dermal layers.

42. However, I note that DE '107 states that its compositions are useful for treating a variety of dermatological skin changes associated with skin aging including problems associated with "limited regenerative turnover in the ***epidermis*** in conjunction with abnormal formation of the horny layer (hornification) that leads to drying out of the skin" and "Abnormal regulation of cell division (proliferation) and cell maturation (differentiation) in the ***epidermis*** resulting in atypical cells and polarity loss." (Ex. 1004, at p. 1, lines 27-34, emphasis added). Thus, DE '107's disclosure of cell proliferation at any particular concentration of adenosine is not limited to fibroblasts or other cells of the dermal layer. Further, a skilled artisan in 1998 would have understood that enhancing epidermal cell "turnover" was desirable in order to overcome the slowdown in epidermal "turnover" rate that was known to occur with age. (Ex. 1021).

43. In other words, a skilled artisan, reading DE '107, would not have understood the disclosure of "cell proliferation" to be limited to proliferation of fibroblasts or any other dermal cells. Rather, the skilled artisan would have understood that DE '107 was discussing skin cell proliferation without limitation to any particular type of skin cell including proliferation of epidermal cells.

44. Importantly, if the inventors' data shows that concentrations of adenosine of 10μM (10^{-5}M) and 100μM (10^{-4}M) does not increase proliferation of fibroblasts, then a skilled artisan would understand that the overlapping range of

adenosine disclosed by DE '107 necessarily does not promote proliferation of fibroblasts at those concentrations. In other words, based on the inventor's data, the natural result flowing from the overlapping range of adenosine disclosed by DE '107 would result in the claimed limitation "without increasing ***dermal cell proliferation***," even if that result would not have been appreciated by a skilled artisan at the time of the invention. Likewise, the inventors' extrapolation regarding the lack of proliferation of ***dermal cells*** associated with the tested concentrations of adenosine applied to fibroblasts must necessarily apply to the overlapping range disclosed in DE '107.

45. Accordingly, as I note in Table 1 above, the claim language "without increasing dermal cell proliferation" is necessarily disclosed through the overlapping ranges of adenosine disclosed in DE '107.

46. In view of the foregoing, it is my opinion that a skilled artisan would have understood that DE '107 discloses each element of claim 1 explicitly or inherently. As such, it is my opinion that DE '107 anticipates claim 1.

Claim 3

47. Claim 3 states that the adenosine concentration is 10^{-4} M to 10^{-6} M. As discussed above regarding claim 1, DE '107 discloses cosmetic compositions for topical application containing an amount of adenosine ranging from 0.001% to 10%. (Ex. 1004, at p. 2, line 28 to p. 3, line 5; p. 14, lines 10-20). As admitted by

the inventors in their declaration, the lower limit of the adenosine amount of DE '107 (0.001%) corresponds to 3.8 x 10^{-5}M adenosine, which falls within the range of claim 3. (Ex. 1009, at p. 89-92 and 107-111). Thus, because DE '107 discloses each element of claim 3, it is my opinion that DE '107 anticipates claim 3.

Claim 5

48. Claim 5 states that the composition further comprises a conditioning agent. DE '107 discloses that the composition includes a conditioning agent. The '327 patent defines "conditioning agent" as inclusive of "an emollient, a humectant, or an occlusive agent." (Ex. 1001, Col. 2, ll. 18-26). The '327 patent further states "emollients help to maintain the soft, smooth, and pliable appearance of skin and function by remaining on the skin surface or in the stratum corneum to act as lubricants, to reduce flaking, and to improve the skin's appearance… humectants act to increase the water content of the top layers of the skin… occlusive agents inhibit the evaporation of water from skin, thereby increasing the water contend [sic] of the skin." (*Id.* Col. 4, ll. 35-45).

49. DE '107 discloses "[i]In keeping with the use according to the invention, cosmetic and dermatological preparations can contain cosmetic adjuvants as conventionally used in such preparations, for example preservatives, bactericides, fragrances, anti-foaming agents, dyes, pigments having a coloring effect, thickeners, **surfactants, emulsifiers, softening, wetting, and/or moisture**

retaining substances, fats, oils, waxes or other conventional components of cosmetic or dermatological formulations like alcohols, polyols, polymers, foam stabilizers, electrolytes, organic solvents or silicone derivates." (Ex. 1004 at p. 3, line 32 to p. 4, line 4, emphasis added). In particular, a skilled artisan would have understood DE'107's disclosure of "softening, wetting, and/or moisture retaining substances," to be the same as the emollients, humectants, and occlusive agents disclosed by the '327 patent as conditioning agents.

50. Thus, because DE '107 discloses each element of claim 5, it is my opinion that DE '107 anticipates claim 5.

Claim 6

51. As discussed above regarding claim 5, DE '107 discloses the same emollients, humectants, and occlusive agents disclosed by the '327 patent. Claim 6 states that the conditioning agent is a humectant, an emollient, or an occlusive agent. Thus, for the reasons discussed above regarding claim 5, a skilled artisan would have understood that DE '107 discloses each element of claim 6. Accordingly, it is my opinion that DE '107 anticipates claim 6.

Claim 7

52. Claim 7 states that the mammal is a human. DE '107 discloses that the cosmetic compositions are used on human skin.

7. The method of claim 1, wherein the mammal is a human.	"It was surprising and unforeseeable by the specialist that for enhancement of

	cell proliferation in **human skin,** preferably in cosmetics or dermatological preparations, remedies the drawbacks of the prior art." (Ex. 1004, at p. 2, lines 1-4, emphasis added).

Thus, because DE '107 discloses each element of claim 7, it is my opinion that DE '107 anticipates claim 7.

Claim 9

53. Claim 9 states that the composition further comprises a transdermal delivery agent. DE '107 does not specifically state that its compositions include a "transdermal delivery agent." However, DE '107 discloses components for inclusion in its compositions that are known to be "transdermal delivery agents." For example, DE '107 discloses and exemplifies compositions comprising adenosine and alcohols and polyols. (Ex. 1004, at p. 3, line 32 to p. 4, line 4). A skilled artisan would have understood at the time of the alleged invention for the '327 patent that alcohols and polyols as disclosed by DE '107 were known to enhance penetration and are "transdermal delivery agents" in context of the '327 patent. Indeed, as shown below, Ong discloses a list of "penetration enhancers," which includes ethanol and propylene glycol as well as dimethyl sulfoxide and decylmethyl sulfoxide, which are disclosed by the '327 patent as preferred "transdermal delivery agents" used to enhance the penetration of adenosine

through topical application . (Ex. 1001 at Col. 5, lines 10-24). Thus, a skilled artisan would have understood that DE '107 necessarily discloses and exemplifies the use of transdermal delivery agents. As shown below, all of the elements of claim 9 are present in DE '107.

9. The method of claim 1, wherein the composition further comprises a transdermal delivery agent.	DE '107 discloses a transdermal delivery agent. Alcohol and polyols are disclosed for use in the compositions of DE '107. (DE '107, at Example 2, p. 5). DE '107 discloses "[i]n keeping with the use according to the invention, cosmetic and dermatological preparations can contain cosmetic adjuvants as conventionally used in such preparations, for example preservatives, bactericides, fragrances, anti-foaming agents, dyes, pigments having a coloring effect, thickeners, surfactants, emulsifiers, softening, wetting and/or moisture-retaining substances, fats, oils, waxes or other conventional components of a cosmetic or dermatological formulation like **alcohols, polyols**, polymers, foam stabilizers, electrolytes, organic solvents or silicone derivates." (DE '107, at p. 3, line 32 to p. 4, line 4, emphasis added). Ong discloses "[t]he term 'penetration enhancer' refers to a compound that enhances the penetration through the skin of the active ingredient(s) of a formulation in which the penetration enhancer is contained, e.g., **ethanol, propylene glycol**, pyrrolidones, **dimethyl sulfoxide**, dimethylacetamide, dimethylformamide, 1-dodecylazacycloheptan-2-one (Azone®) **decylmethyl sulfoxide**, oleic acid or

	diisopropyl adipate.) (Ong, at Col. 2, lines 4-13, emphasis added).

Thus, because DE '107 discloses each element of claim 9, it is my opinion that DE '107 anticipates claim 9.

II. CLAIMS 1, 3-7 AND 9 OF THE '327 PATENT WOULD HAVE BEEN OBVIOUS OVER DE '107

54. For the reasons that follow, claims 1, 3-7, and 9 would have been obvious to a skilled artisan over DE '107.

55. As discussed above, DE '107 discloses all of the limitations of claims 1, 3, 5-7, and 9 of the '327 patent. Claim 4 merely adds an approximate concentration of adenosine of "about 10^{-4}M ." I note that DE '107 does not exemplify a composition including adenosine within the claimed ranges. However, a skilled artisan would have sought to use the lowest effective amount of adenosine disclosed by DE '107 of 0.001%. (Ex. 1004, at p. 2, line 28 to p. 3, line 5; p. 14, lines 10-20). For example, in my experience in working with topical cosmetic compositions, a skilled artisan would have attempted to use the lowest effective amount of an active ingredient in order to: 1) reduce cost, 2) avoid or minimize possible side effects, and 3) increase formula stability. Thus, it is my opinion that a skilled artisan would have used the lowest effective amount of adenosine taught by DE '107 (0.001%) as a starting point in formulating

adenosine-containing compositions for care of skin conditions related to aging, such as wrinkling and dryness.

56. In view of the above, it is my opinion that the disclosure of DE '107, while not exemplifying an amount of adenosine within the claimed range, would have led a skilled artisan to formulate a composition comprising adenosine for care of skin conditions related to aging, such as wrinkling and dryness with an amount of adenosine as low as 0.001%, which overlaps the claimed ranges. As such, it is my opinion that claims 1, 3-7, and 9 would have been obvious to a skilled artisan in view of DE '107.

III. CLAIMS 1, 3-7 AND 9 OF THE '327 PATENT WOULD HAVE BEEN OBVIOUS OVER JP '153 AND DE '107

57. For the reasons that follow, claims 1, 3-7, and 9 would have been obvious to a skilled artisan over the combination of JP '153 and DE '107.

58. JP'153 relates to compositions for application to the skin to prevent and treat effects of skin aging, such as wrinkling. (Ex. 1006, 5:14-20, 12:4-8.) JP'153's skin compositions include adenosine or adenosine derivatives. (*Id.*, 5:22-32, Examples 8, 11, 12.) The skin compositions may be a skin cosmetic such as a beauty serum or lotion, and may contain adenosine in an amount ranging from about 0.01%-10% by weight. (*Id.*, 8:21-9:8.)

Claim 1

59. JP '153 discloses cosmetic compositions comprising adenosine and adenosine derivatives, such as adenosine monophosphate ("AMP") for the treatment of skin aging and wrinkles. (Ex. 1006, Abstract, ¶ [0012]). JP '153 teaches that an AMP in combination with adenosine leads to improved cosmetic properties compared to adenosine alone. (Ex. 1006, Examples 11-12, Table 7). For the reasons that follow, claim 1 would have been obvious to a skilled artisan.

Claim	JP '153
1. A method for enhancing the condition of unbroken skin of a mammal by reducing one or more of wrinkling, roughness, dryness, or laxity of the skin, without increasing dermal cell proliferation,	JP '153 discloses a cosmetic product for the treatment of wrinkles. "To offer preparations for **external use on the skin** which have a synergically intensified activated oxygen species eliminating action, and can prevent skin ageing and injury caused by intra- and extracorporeal oxidation stress." (Ex. 1006, at Abstract, emphasis added) "As the inclusion rates of **adenosine** or a derivative thereof, and hamamelitannin, etc., in the external preparation or cosmetic base, about **0.01-10 wt%** and 0.0001-10 wt%, respectively, are suitable, considering the effect of the base and the effective dose for an action on the skin, etc." (Ex. 1006, at ¶[0012] , emphasis added) **[Example 12]** Skin cream (1) beeswax 6.00

	(wt%)
	(2) cetanol 5.00
	(3) reduced lanolin 8.00
	(4) squalane 37.50
	(5) glyceryl fatty acid ester 4.00
	(6) lipophilic glycerol monostearate 2.00
	(7) polyoxyethylene (20EO) sorbitan monolaurate 2.00
	(8) propylene glycol 5.00
	(9) methyl paraoxybenzoate 0.10
	(10) adenosine 0.02
	(11) witch hazel 50 wt% ethanol extract 0.01
	(12) thioredoxin-thioredoxin reductase complex 0.10
	(13) fragrances 0.15
	(14) pure water 30.12
	(Ex. 1006, at ¶[0022] , emphasis added)
	"Usage tests were carried out on the aforementioned example 8 to example 13 of the present invention. In the usage tests, there were groups of 20 panellists ordinarily employed for field tests, the different groups used the examples and comparative examples separately in a blinded fashion on the face and hands, and evaluation was carried out by observing **changes in wrinkling and skin elasticity.** The period of use was 1 year, from April to March. **Wrinkling was evaluated** by 5 stages "decrease", "slight decrease", "no change", "minute increase in wrinkling", and "clear increase in wrinkling", skin elasticity was evaluated by 5 stages "raised",

	"slightly raised", "no change", "slight decrease", and "decrease", each evaluation is presented in Table 7 as the numbers of panellists giving each score." (Ex. 1006, at ¶[0024] , emphasis added) JP '153 does not disclose the treatment of wounds or broken skin, so a skilled artisan would understand JP '153 to include treatment of unbroken skin.
the method comprising topically applying to the skin a composition comprising a concentration of adenosine in an amount effective to enhance the condition of the skin without increasing dermal cell proliferation, wherein the adenosine concentration applied to the dermal cells is 10^{-4} M to 10^{-7} M.	JP '153 discloses topically applying to the skin a composition comprising a concentration of adenosine to prevent aging and treatment of wrinkles. The claimed range converted to wt. % is 0.00265% to 0.00000265%. (Ex. 1009, at 84) "As the inclusion rates of **adenosine or a derivative thereof**, and hamamelitannin, etc., in the external preparation or cosmetic base, about **0.01-10 wt%** and 0.0001-10 wt%, respectively, are suitable, considering the effect of the base and the effective dose for an action on the skin, etc." (Ex. 1006, at ¶[0012] , emphasis added)

60. JP '153 discloses adenosine in amount of 0.02 wt%, or 7.6 x 10^{-4}M, and a range with a lower limit of 0.01 wt. %, or 3.8 x 10^{-4}M (according to the inventors' calculations, *e.g.*, 0.001 wt.% = 3.8 x 10^{-5}M). (Ex. 1006, at ¶[0012], [0022], Ex. 1009, at 91). Thus, the range and examples of JP '153 fall outside of,

but are close to, the claimed range of 10^{-4}M to 10^{-7} M. However, I note that the '327 patent does not disclose any reason why the claimed range is critical to the claimed method. In fact, the '327 patent discloses concentrations of adenosine as high as 10^{-3}M, which overlaps the range disclosed by JP '153, and includes the amounts exemplified (e.g., Example 12). (Ex. 1001, col. 2, ll. 14-17 and 30-34). Thus, it is my opinion that the compositions of JP '153, and in particular Example 12, would have functioned the same as the claimed composition for use in the method of claim 1, including the limitation that dermal cell proliferation would not be increased. Nonetheless, a skilled artisan would have found it obvious to use the amounts of adenosine taught by DE '107 for the reasons that follow.

61. As discussed above, DE '107 discloses cosmetic compositions containing adenosine for care and prevention of signs of aging of the skin. (Ex. 1003, Ex. 1004, p. 1, lines 1-39.) Similar to JP, 153, DE'107 teaches that the adenosine compositions can be applied to the skin to treat damage resulting from aging, such as wrinkling and drying out of the skin. (*Id.*, p. 1, lines 20-29.) As also discussed above, a skilled artisan would have sought to use the lowest effective amount of adenosine disclosed by DE '107 of 0.001%. (Ex. 1004, at p. 2, line 28 to p. 3, line 5; p. 14, lines 10-20). For example, in my opinion, a skilled artisan would have attempted to use the lowest effective amount of an active ingredient in order to: 1) reduce cost, 2) avoid or minimize possible side effects,

and 3) increase formula stability. Thus, it is my opinion that a skilled artisan would have used the lowest effective amount of adenosine taught by DE '107 (0.001%) as a starting point in formulating adenosine-containing compositions for care of skin conditions related to aging, such as wrinkling and dryness. As such, it would have been obvious to use the lowest effective amount of adenosine taught by DE '107 in the compositions of JP '153 because both DE '107 and JP '153 are directed to common purposes of treating age-related skin damage such as wrinkling and dryness. In my opinion, a skilled artisan would have expected such a modification to be successful in view of DE '107's disclosure of 0.001% as the lowest effective amount of adenosine.

62. In view of the foregoing, claim 1 would have been obvious to a skilled artisan based on the combination of JP '153 and DE '107.

Claim 3

63. Claim 3 states that the adenosine concentration is 10^{-4} M to 10^{-6} M. As discussed above regarding claim 1, JP '153 modified by DE '107 discloses cosmetic compositions for topical application containing an amount of adenosine ranging from 0.001 wt% As admitted by the inventors in their declaration, the lower limit of the adenosine amount of DE '107 (0.001%) corresponds to 3.8×10^{-5}M adenosine, which falls within the range of claim 3. (Ex. 1009, at p. 89-92 and

107-111). Thus, claim 3 would have been obvious to a skilled artisan over the combination of JP '153 and DE '107.

Claim 4

64. Claim 4 states that the adenosine concentration is about 10^{-4} M. As discussed above regarding claim 1, JP '153 modified by DE '107 discloses cosmetic compositions for topical application containing an amount of adenosine ranging from 0.001wt%. As admitted by the inventors in their declaration, the lower limit of the adenosine amount of DE '107 (0.001%) corresponds to 3.8×10^{-5}M adenosine, which means that the claimed concentration of about 10^{-4} M is within the range disclosed by JP '153 modified by DE '107. (Ex. 1009, at p. 89-92 and 107-111). Thus, claim 4 would have been obvious to a skilled artisan over the combination of JP '153 and DE '107.

Claims 5 and 6

65. Claim 5 recites that the composition further comprises a conditioning agent, and claim 6, which depends from claim 5, recites "wherein the conditioning agent is a humectant, an emollient, or an occlusive agent."

66. JP '153 meets these limitations. For example, the '327 patent defines "conditioning agent" as including "an emollient, a humectant, or an occlusive agent." (Ex. 1001, col. 2, lines18-26). In addition, the '327 patent defines emollients to include "acetyl trioctyl citrate, cetyl alcohol, butyl myristate, ***cetyl***

alcohol, and mineral oil." (*Id.*, 4:30-46, emphasis added.) JP'153 exemplifies the use of cetanol (*i.e.*, cetyl alcohol). (Ex. 1006, Example 12). As such, a skilled artisan would have recognized that JP '153 discloses and exemplifies the use of an emollient as defined by the '327 patent.

67. In view of the foregoing, claims 5 and 6 would have been obvious to a skilled artisan over the combination of JP '153 and DE '107.

Claim 7

68. Claim 7 adds the limits the method to humans, reciting, "wherein the mammal is a human." As shown below, JP '153 discloses this limitation.

7. The method of claim 1, wherein the mammal is a human.	JP '153 discloses application of compositions to human skin. (Ex. 1006, at Title, Abstract). "Usage tests were carried out on the aforementioned example 8 to example 13 of the present invention. In the usage tests, there were groups of 20 panellists ordinarily employed for field tests, the different groups used the examples and comparative examples separately in a blinded fashion on the face and hands, and evaluation was carried out by observing changes in wrinkling and skin elasticity." (Ex. 1006, at ¶ [0024])

69. Accordingly, a skilled artisan would have understood that the teachings of JP '153 are directed to the application of compositions to human skin. Thus, claim 7 would have been obvious to a skilled artisan over the combination of

JP '153 and JP '153.

Claim 9

70. Claim 9 adds the limitation "wherein the composition further comprises a transdermal delivery agent." JP '153 discloses this element. For example, JP '153 discloses propylene glycol, which Ong discloses in a list of "penetration enhancers." A skilled artisan would have understood at the time of the alleged invention for the '327 patent that propylene glycol disclosed by JP '153 was known to enhance penetration of topically applied compositions and is a "transdermal delivery agent" in context of the '327 patent. Indeed, as shown below, Ong discloses penetration enhancers to include ethanol and propylene glycol as well as dimethyl sulfoxide and decylmethyl sulfoxide disclosed by the '327 patent as preferred "transdermal delivery agents" used to enhance the penetration of adenosine through topical application. (Ex. 1001, at Col. 5, lines 10-24). Thus, a skilled artisan would have understood that JP '153 necessarily discloses and exemplifies the use of transdermal delivery agents. Further, as discussed above, DE '107 also discloses transdermal delivery agents. I further note that the use of transdermal delivery agents, such as propylene glycol, in topical cosmetic compositions was in 1998, and still today, a common practice.

9. The method of claim 1, wherein the composition further comprises a transdermal delivery agent.	**[Example 11]** Skin lotion	
	(1) squalane	5.00(wt%)
	(2) white petrolatum jelly	2.00
	(3) beeswax	0.50

	(4) sorbitan sesquioleate 0.80 (5) polyoxyethylene (20EO) oleyl ether 1.20 (6) **propylene glycol** 5.00 (7) carboxyvinyl polymer 1.0 wt% aqueous solution 20.00 (8) methyl paraoxybenzoate 0.10 (9) potassium hydroxide 0.10 (10) adenosine 0.02 (11) adenosine monophosphate 0.02 (12) horse chestnut propylene glycol extract 0.01 (13) great burnet glycerol extract 0.01 (14) fragrances 0.10 (15) pure water 65.14 (JP '153, at ¶ [0021], emphasis added). Ong discloses "[t]he term 'penetration enhancer' refers to a compound that enhances the penetration through the skin of the active ingredient(s) of a formulation in which the penetration enhancer is contained, e.g., **ethanol, propylene glycol**, pyrrolidones, **dimethyl sulfoxide**, dimethylacetamide, dimethylformamide, 1-dodecylazacycloheptan-2-one (Azone®) **decylmethyl sulfoxide**, oleic acid or diisopropyl adipate.) (Ong, at Col. 2, lines 4-13, emphasis added).

71. In view of the fact that both JP '153 and DE '107 disclose a transdermal delivery agent, a skilled artisan would expect that the combination of the teachings would also include a transdermal delivery agent. Thus, claim 9 would have been obvious to a skilled artisan over the combination of JP '153 and DE '107.

72. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: March 15, 2018

R. Randall Wickett, Ph.D.

EXHIBIT A
Curriculum Vitae of R. Randall Wickett, Ph.D.

Curriculum Vitae
R. Randall Wickett, Ph.D.

BUSINESS ADDRESS: R. Randall Wickett, Ph.D.
James L. Winkle College of Pharmacy
University of Cincinnati
3225 Eden Ave
Cincinnati, Ohio 45267-0004
Phone (513) 207-8185
Email: randy.wickett@uc.edu

EDUCATION:
Ph.D., biophysics, Oregon State University, Corvallis Oregon, 1973
B.A., chemistry, Western Washington State College, Bellingham Washington, 1968

WORK EXPERIENCE:

1/14-Present: Professor Emeritus of Pharmaceutics and Cosmetic Science. University of Cincinnati College of Pharmacy

7/93-Present: President R. Randall Wickett Consulting Services, providing services to the Personal Care and Pharmaceutical Industries on claim support, research guidance, test design, clinical monitoring, custom formulation and technical training in skin and hair care science and technology, experienced expert witness in patent and claim support litigation including trial testimony. References are available on request.

9/98-2013: Professor of Pharmaceutics and Cosmetic Science, University of Cincinnati, College of Pharmacy: In charge of graduate program in skin pharmaceutics and cosmetic science.

7/91-9/98: Associate Professor of Pharmaceutics and Cosmetic Science, University of Cincinnati, College of Pharmacy.

9/88-7/91: Research Associate, Dermal Research Department, S.C. Johnson Wax, Racine WI. In charge of clinical and biophysical research group, conducting *in vitro* and *in vivo* testing for guidance of product development and advertising claim support in skin and hair care.

10/85-9/88: Senior Scientist, Department of Dermal Research, S.C. Johnson Wax, Racine WI: Responsible for biophysical testing of skin and hair care product efficacy for research guidance and advertising claim support.

7/74-10/85: Staff Scientist, Procter & Gamble, Cincinnati OH: Basic and applied research on skin and hair.

9/72-6/74: Post-Doctoral Fellow, University of Minnesota Minneapolis MN: Research on protein conformational dynamics.

PROFESSIONAL AWARDS AND HONORS:

Maison G. deNavarre Medal Award from the Society of Cosmetic Chemists (SCC), awarded December 1997. This is the Society's highest honor, awarded for technical contributions to cosmetic science.

International Journal of Cosmetic Science Award for best paper published in the Journal in 2011 (with M. Visscher and M. Robinson)

Appointed an International Corresponding Member of the Chilean Academy of Pharmaceutical Sciences, August 7, 2009

Society of Cosmetic Chemists Merit Award for distinguished contributions, achievement and service to the Society December 7, 2007

Society of Cosmetic Chemists 2001 Literature Award for outstanding contributions to the cosmetic science literature

International Flavors and Fragrances Award for best paper presented to the Society and published in the Journal of the Society of Cosmetic Chemists during 1998 (With A Shah and S. Mukerjee).

Elected a Fellow of the Society of Cosmetic Chemists, September 1996

Joseph P. Ciaudelli award for the best paper on hair care technology, published in the Journal of the Society of Cosmetic Chemists during 1996 (with M. Manuszak and E. Borish).

International Flavors and Fragrances Award for best paper presented to the Society and published in the Journal of the Society of Cosmetic Chemists, 1996 (with M. Manszak and E. Borish).

Shaw Mudge Award for best paper presented at the SCC Annual Scientific Seminar, May 1996 (with D. Imbert and G. Kasting, paper presented by D. Imbert).

Dragoco Award for best paper presented at the SCC Annual Scientific Meeting, December 1994(with A. Warrier, R. Harper, J. Bowman and A. Kligman, paper presented by R. Wickett).

SCC Ohio Valley Chapter Award for best scientific paper presented to the SCC Ohio Valley Chapter during 1991.

International Flavors and Fragrances Award for best paper presented to the SCC and published in the Journal of the Society of Cosmetic Chemists during 1983.

Shaw Mudge Award for best paper presented at the SCC Annual Scientific Seminar, May 1983.

PROFESSIONAL SERVICE:

Chairman: International Society for Stratum Corneum Research, September 2014-Present

President: Society of Cosmetic Chemists, December 2010 – December 2011

Vice President: Society of Cosmetic Chemists, December 2009-December 2010

Vice President Elect: Society of Cosmetic Chemists, December 2008 December 2009

Chairman: International Society for Bioengineering and the Skin, March 2000-October 2005

Editor: Journal of the Society of Cosmetic Chemists, January 1991- December 1997.

Committee on Scientific Affairs: Society of Cosmetic Chemists, 2000-2004

Education Advisory Board: Society of Cosmetic Chemists 2000-2003

US Program Convenor: International Society for Bioengineering and the Skin (ISBS), 1988 to present

Editorial Committee: Journal of the Society of Cosmetic Chemists, Skin Research and Technology, International Journal of Cosmetic Science, Romanian Society of Cosmetic Chemists Magazine

Program Chairman: Ohio Valley Chapter of the SCC, 1993-1994, 1996-1998.

50th Anniversary Committee: Society of Cosmetic Chemists, 1995.

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INVITED PRESENTATIONS

Human Skin Anatomy and Physiology in Health and Disease, Dermatological Drug Products, Development and Regulatory Considerations, Workshop, American Association of Pharmaceutical Sciences, San Diego CA, November 11-12, 2017.

Combining Biomarkers and Instrumental Measurements in Skin Research, Keynote address 40th Anniversary meeting of the South African Society of Cosmetic Chemists, Johannesburg South Africa September 13-14 2017

Postnatal development of infant skin function, 40th Anniversary meeting of the South African Society of Cosmetic Chemists, Johannesburg South Africa September 13-14 2017

Effects of season on stratum corneum barrier function and skin biomarkers, Southwest Chapter Society of Cosmetic Chemists, Dallas TX, May 11, 2017

Latest methods for evaluating cosmetic product effects on skin, including biomarkers and instrumentation, Chiang Mai University, Chiang Mai Thailand, November 7, 2016

Role of structural and sebaceous lipids in skin health, American Oil Chemists Society Meeting, Salt Lake City, UT, May 2-4, 2016

Cytokines and Structural Proteins as Biomarkers of Skin Health, Workshop on Omics, In Cosmetics Paris France April 12, 2016

Skin Structure and Device Interfacing, Skin for Engineers Workshop, Miami Fl. January 19-20, 2016

Innovative Actives and Current Trends in Cosmeceuticals, Faculty of Pharmacy, Chiang Mai University, Chiang Mai Thailand, November 6, 2015

Surfactants and human skin: Perspectives from 40 years of skin research, Joint meeting of the American Oil Chemists Society and the Society of Cosmetic Chemists, Orlando FL, May 4-6, 2015

Variable Responses to Skin Irritants, Ohio Valley Chapter of the Society of Cosmetic Chemists, Cincinnati OH, February 18, 2015

Topical Delivery Fundamentals: Mini-Breakfast Seminar, Society of Cosmetic Chemists Annual Scientific Meeting, New York NY, December 12, 2014

Mechanical and Optical Evaluation of Skin, World Congress of International Society for Biophysics and Imaging of the Skin, Mystic CT, June 2, 2014

Reflections on 40 years in Skin Science, Ohio Valley Chapter of the Society of Cosmetic Chemists, Cincinnati OH, April 16, 2014

Skin Barrier to Cosmetic Ingredient Delivery: Symposium-Moving Forward to Skin Care Cosmetic Innovation: Bangkok Thailand, February 13, 2014

Skin Measurements, in House, in a CRO or in the "Real World", Key Note Address, California Chapter of the Society of Cosmetic Chemists Suppliers Day, Los Angeles CA, September 24-25, 2013

Biochemistry and Biophysics of the Skin, Mini-Breakfast Seminar, Society of Cosmetic Chemists Annual Scientific Seminar, St. Louis MO, June 6-7. 2013

Cosmeceuticals: What are they and how do they work? Perspectives in Percutaneous Penetration, 13th International Conference, La Grande Motte France April 10-14, 2012

Development and Testing of Natural Cosmeceuticals, Keynote Lecture, International Federation of Society of Cosmetic Chemists Conference Bangkok Thailand, December 12-14, 2011

Skin Research in the "Real World", US symposium of the International Society for Biophysics and Imaging of the Skin, Tampa FL April 7-9, 2011

New Dimensions in Personal Care: Harnessing the Synergy between Dietary Nutrients and Cosmeceuticals, Conference on Natural and Functional Ingredients, Bangkok Thailand March 16, 2011

Future Trends for Development and Testing of Cosmeceuticals from Nature, Keynote Lecture 3rd International Conference of Natural Products for Health and Beauty, Bangkok Thailand March 16-18, 2011

The Future of Non-invasive testing of skin care products, 3rd International Conference of Natural Products for Health and Beauty, Bangkok Thailand March 16-18, 2011

Measurement Technology Transfer between Medical and Cosmetic Applications, Technology Transfer Conference of the New York Society of Cosmetic Chemists, Newark NJ, October 20, 2010

The Future of Noninvasive Measurements for Cosmetic Claim Support, Annual Scientific Seminar of the California Society of Cosmetic Chemists, Los Angeles CA, October 7, 2010

Mechanical and Surface Properties of Skin, World Congress of the International Society for Biophysics and Imaging of the Skin Buenos Aires Argentina, September 24-26, 2010

Influence of TNF-α polymorphism -308 on Neurosensory Response and Irritant Dermatitis, Twin Cities Chapter of the Society of Cosmetic Chemists, Minneapolis MN April 20, 2010

Measuring Cosmetic Efficacy, Conference on Wisdom and Research Application in Thai Herbal Cosmeceuticals, Bangkok Thailand, December 17-18, 2009

Current Research in Cosmeceuticals, Conference on Wisdom and Research Application in Thai Herbal Cosmeceuticals, Bangkok Thailand, December 17-18, 2009

Neonatal Skin Maturation – *Vernix Caseosa* and Natural Moisturizing Factor, International Society for Biophysics and Imaging of the Skin, Besancon France September 9-12, 2009

Effects of Hand Hygiene Procedures and Aggressive Lotion Intervention on Irritant Dermatitis in Health Care Workers in the "Real World", Chilean Academy of Pharmaceutical Sciences, University of Chile, Santiago Chile August 17th 2009

Measuring Cellulite, 34th International Meeting of the Chilean Society of Cosmetic Chemists, Santa Cruz, Chile August 14-16, 2009

Basic Bioengineering Techniques for Skin Measurement, 34th International Meeting of the Chilean Society of Cosmetic Chemists, Santa Cruz, Chile August 14-16, 2009

Skin Rejuvenation from a Scientific Perspective, ENSAS-Estonian Dermatological Society Meeting, Tallinn Estonia, May 8, 2009

Effect of Lotions and Creams on Irritant Dermatitis in Health Care Workers, Southeast Chapter Society of Cosmetic Chemists, Memphis TN April 29, 2009

Mechanical Properties of Skin, International Society for Biophysics and Imaging of the Skin, Dallas TX, March 18-21 2009

Influence of Dressings on Barrier Repair: Effects on Biophysical Measurements and Natural Moisturizing Factors International Society for Biophysics and Imaging of the Skin, Dallas TX, March 18-21 2009

Oxidative Stress and Skin Aging, Bruno Werdleman Foundation Lecture, Department of Chemistry, Chiang Mai University, Chiang Mai Thailand December 22, 2008

Effect of oral intake of choline-stabilized orthosilicic acid on hair tensile strength and morphology in women with fine hair, 2nd International Conference of Natural Products for Health and Beauty, Phayao Thailand December 17-19 2008

Molecular Biology of Oxidative Stress in Photoaging of Skin, Society for Free Radicals Thailand Conference, Chiang Mai Thailand December 16, 2009

Racial and ethnic variations in Skin Properties and Response to Irritant, Formulating for Diversity Fall Technical Symposium, Midwest Chapter Society of Cosmetic Chemists, Chicago IL October 17, 2008

Vernix Caseosa, The Natural Moisturizer of a New Born Baby's Skin, Symposium in honor of Professor Ubonthip Nimminent, Chulalongkorn University Bangkok Thailand August 1-2 2008

Clinical Studies of Anti-aging products, "Symposium on the Evaluation of Cosmetic Products: Antiaging and Hair care Products", Bangkok Thailand September 6-7, 2007

Measuring Skin Irritation, "Symposium on the Evaluation of Cosmetic Products: Antiaging and Hair care Products", Bangkok Thailand September 6-7, 2007

Evaluating Hair, "Symposium on the Evaluation of Cosmetic Products: Antiaging and Hair care Products", Bangkok Thailand September 6-7, 2007

Measurement of Cellulite, 1st Symposium on Cosmetic and Health Innovations, Bangkok Thailand, May 26-27, 2007

Skin Pigmentation and Skin Lightening: Overview and Results with Deoxyarbutin and its Second Generation Derivatives, 1st Symposium on Cosmetic and Health Innovations, Bangkok Thailand, May 26-27, 2007

Structure and Function of the Epidermal Barrier, Back to Basics Skin care Symposium, Ohio Valley Society of Cosmetic Chemists, April 18, 2007

Electrical Measurements on Skin, International Society for Skin Imaging and Biophysics Meeting, Atlanta GA October 12-14, 2006

Effect of Weight Loss on Cellulite Severity, 20th Brazilian Congress on Cosmetology, San Paulo Brazil April 18-20, 2006.

Skin Color and Skin Lightening, Overview and results with a new skin lightening agent, Asociación Argentina de Químicos Cosméticos meeting, Buenos Aires Argentina, April 17, 2006

Function and analysis of skin's natural moisturizers, Asociación Argentina de Químicos Cosméticos meeting, Buenos Aires Argentina, April 17, 2006

Biochemical and Biophysical Studies of Skin's Natural Moisturizers, COSCEM 2005, Johannesburg, South Africa, October 5-6, 2005

Comparing African American and European American Skin: Biophysical Properties and Response to Irritant, 2nd World Congress on Non-Invasive Methods and the Skin, Philadelphia PA, September 29-October 1, 2005

Cutaneous Biometrology in Neonatal Medicine, Symposium in Honor of Pierre Agache, International Association of Cosmetic Dermatology Meeting, Paris France, July 3-5, 2005

Permanent Waving and Depilation, Society of Cosmetic Chemists Annual Scientific Seminar, Las Vegas, NV, June 2-3, 2005.

Bioengineering advances in the analysis of cellulite, Congress on Bioengineering and Biometrics of Skin and Hair, San Paulo Brazil, July 25,26 2004.

A new method for biochemical skin evaluation, Congress on Bioengineering and Biometrics of Skin and Hair, San Paulo Brazil, July 25,26 2004.

Basic Skin Evaluation Methods, Society of Cosmetic Chemists Annual Scientific Seminar, Uncasville CT, May 7-8, 2004.

Hair Structure, Chemistry and Product Evaluation, Symposium on Evaluation of Hair Care Products Chulalongkorn University, Bangkok Thailand, December 22-23, 2003

Basics of Skin Structure, Society of Cosmetic Chemists Annual Meeting, New York NY Dec 4-5 2003.

Basic Research on Ethnic Hair, to Second International Symposium on Ethnic Hair and Skin, Chicago IL, September 19-21, 2003

Bioengineering Evaluations of Exogenous and Endogenous Moisturizers, Midwest Chapter of the Society of Cosmetic Chemists, Chicago IL March 11, 2003

Skin color measurements, Symposium on Evaluation of Cosmetic Products, Chulalongkorn University, Bangkok Thailand, December 19-20, 2002

Use of Bioengineering Methods in Product Efficacy Studies, Symposium on Evaluation of Cosmetic Products, Chulalngkorn University, Bangkok Thailand, December 19-20, 2002

Electrical Measurements of Skin, International Society for Bioengineering and the Skin Workshop, Baltimore MD., October 24, 2002.

Current Research in Skin Moisturization: International Cosmetic Expo. Miami FL February 21, 2002.

Cosmetic Science Education at the University of Cincinnati, Naresuan University, Phitsanulok Thailand, October 13, 2001

Mechanisms of Skin Moisturization, Conference on Cosmetic Science, Mahidol University Bangkok Thailand, October 12, 2001

Skin Bioengineering and Biochemistry, Conference on Cosmetic Science, Mahidol University Bangkok Thailand, October 11, 2001

Overview of Skin Science Research at the University of Cincinnati, Providence University, Taichung, Taiwan, September 21, 2001

Recent Studies of Stratum Corneum Barrier Formation and Homeostasis, Taipei Medical University, Taipei Taiwan, September 20, 2001

Bioengineering evaluation of the water handling capabilities of stratum corneum *in vivo*, Creation and Hope, IFSCC International Conference, Taipei, Taiwan, September 17-19, 2001

Non-invasive evaluation of stratum corneum function: Fifth Romanian International symposium on Cosmetic and Flavour Products: Iasi Romania, May 29-June 1, 2001

Skin Biochemistry, Society of Cosmetic Chemists Annual Scientific Seminar New Orleans, LA, May 9, 2001.

Use of the Moisture Accumulation Test to Assess Skin Breakdown and Repair, Society of Cosmetic Chemists and International Society for Bioengineering and the Skin: Joint Educational Symposium: Evaluation of the Skin Barrier: Breakdown and Repair, New York, NY, Wednesday December 6, 2000

Evaluation of Stratum Corneum Function Using the Moisture Accumulation Test, Department of Dermatology, Veteran's Administration Hospital, San Francisco, CA, October 29, 2000.

Stratum Corneum Physiology and Moisturizing Mechanisms, St. Louis Society of Cosmetic Chemists Annual Scientific Seminar, St Louis, MO, September 29, 2000

Hair care product testing, Consumer Products - Business Unusual, Symposium of the Connecticut Chapter of the Society of Cosmetic Chemists, Stamford Connecticut, September 19, 2000.

Evaluation of skin barrier function by measurement of electrical properties under probe occlusion, International Society for Bioengineering and the Skin, Jerusalem, Israel March 26-30, 2000

Skin Care: Meeting of the Western Ohio American Association of Diabetes Educators, Dayton OH, March 9, 2000.

We need better than Neanderthal techniques to study the neonatal barrier, 12th International Contact Dermatitis Symposium, San Francisco CA, October 14-18, 1999.

How do cosmetics moisturize skin?, Society of Cosmetic Chemists, Long Island Chapter, 1998 Educational Seminar, Melville NY, September 9, 1999.

Effects of α-hydroxy acids on human skin, 4th Romanian International Symposium on Cosmetic and Flavor Products, Iasi Romania, June 1-4, 1999

Similarities and Differences in Physical Properties of Gray and Pigmented Hair, Second Intercontinental Meeting of Hair Research Societies, Washington DC, November 5-7, 1998.

Comparing the effects of lactic acid and glycerin on human skin *in vivo,* Society of Cosmetic Chemists Area IV Symposium, Emerging Technologies in Skin Care, Myrtle Beach, SC October 9-10, 1998.

Skin Care Products in the Nursery, National Association of Neonatal Nurses, Annual Meeting, Cincinnati OH, September 25, 1998.

Racial Differences in Skin Barrier Function in Adults and Infants, Society of Cosmetic Chemists, Long Island Chapter, 1998 Educational Seminar, Melville NY, September 10, 1998.

Comparing the effects of lactic acid and glycerin delivered from simple formulations, Society of Cosmetic Chemists (SCC), Area II Technical Symposium, Chicago IL, September 19, 1997.

Using the Cutometer and Dermal Torque Meter for skin elasticity measurements, Ohio Valley Chapter of the SCC, Cincinnati OH, September 17, 1997.

Practical Aspects of Skin Elasticity Measurement, University of Cincinnati, Department of Dermatology Procter and Gamble Lecture, Cincinnati OH, June 19, 1997.

Gray and Pigmented Hair: Are they different, Scientific Seminar on Haircare, California Chapter of the SCC, Los Angeles CA, May 6, 1997.

Differences in mechanical properties and set in gray and pigmented human hair, Mid Atlantic Chapter of the SCC, Baltimore MD March 11, 1997.

AHA Update, California Chapter of the SCC, Los Angeles CA, February 25, 1997

Skin Elasticity Measurements for Cosmetic Science, Lake Erie Chapter of the SCC, Akron OH, February 18, 1997.

Modeling Stratum Corneum Elasticity with the Dermal Torque Meter, 11th Biannual Symposium of the International Society for Bioengineering and the Skin(ISBS), Zurich, Switzerland, October, 3-5, 1996.

Biomechanical Properties of Skin, Dermal Clinical Evaluation(DCES) Society Annual Educational Seminar, Tarytown, NY, September 20, 1996.

Latest concepts from academia, The living stratum corneum, HBA Global Expo, Symposium on 21st Century Skin Care, New York, NY, June 3, 1996.

Comparison of Cutometer and Dermal Torque Meter for skin elasticity measurements, ISBS, 20th Anniversary Symposium, Miami, FL, February 15-17, 1996.

Mechanical properties and set in gray and pigmented hair, ISBS, 20th Anniversary Symposium, Miami, FL, February 15-17, 1996.

Practical protocols for mildness evaluation using bioinstruments, Joint SCC-ISBS Symposium, Instrumental Testing of Claim Support, New York, NY December 6, 1995

Alpha-hydroxy Acids, Cosmeceuticals?, "New Compounds in Skin Care: The future of topical preparations, Symposium Sponsored by Bausch & Lomb, Amelia Island, Florida, April 8, 1994.

Fruit Acids in Cosmetics, American Academy of Dermatology, Cosmetic Forum, Washington DC, December 8, 1993.

Use of electrical measurements to assess skin barrier function, Cutaneous Biometrics & Bioengineering of Skin, New York, NY, December 8, 1993.

Biophysical assessment of skin condition: A practical overview, DCES Education Seminar IX, Washington DC, September 11, 1992.

Effects of moisturizer treatment on some clinical and biophysical properties of aging skin, Technical Seminar of the Lake Erie and Ohio Valley Chapters of the SCC, Columbus, Ohio October 25, 1991.

Biophysical evaluation of efficacy in skin and hair care products, Fall Symposium of the Golden Gate Chapter of the SCC, San Francisco, CA, October 11, 1991

Biophysical methods as adjuncts to clinical testing of hand and body lotions, SCC-ISBS, Joint Symposium on Biophysical Methods for Product Evaluation, Chicago IL, May 1, 1991.

Product Effects on the Biophysical Properties of Skin, Annual Education Seminar VII of the DCES, Washington DC, September 14, 1990.

The relationship between the effects of chemical and physical properties of hair and the development of permanent set, Midwest Chapter of the SCC, September 1989.

Viscoelastic properties of skin and hair, 7th ISBS Symposium, Milwaukee Wisconsin, June 1988

Stress Decay Studies of Hair Reduction, ISBS Symposium on Biophysical Measurements of Skin, Hair and Nails, Philadelphia, PA, September 1987

Mechanisms of Stratum Corneum Plasticization, Joint ISBS-SCC Symposium in honor of Tom Cook, New York, NY, December 1986.

Physical and Mechanical Testing of Skin, Skin Science Symposium sponsored by the Florida Chapter of the SCC. April 19, 1986.

Kinetic Studies of Hair Reduction using a Single Fiber Method, Ohio Valley Chapter, Society of Cosmetic Chemists, October 1985.

Thermal analysis of human and swine stratum corneum structure: Identification of transitions due to cell envelopes, Sixth Conference on Epidermal Differentiation, St. Claire, Michigan, July, 1977

SHORT COURSES AND WORKSHOPS

Clinical and Instrumental Testing of Skin, One-day course, Society of Cosmetic Chemists, New York NY December 7, 2016

Basic and Advanced Skin Science, Two-day course for the US Food and Drug Administration College Park MD, September 7-8 2016

Basic and Advanced Skin Science, Two-day course for the Society of Cosmetic Chemists, New York NY March 14-15 2016

Advanced Skin Care Science, One day course for the Society of Cosmetic Chemists, New York NY, May 22, 2015

Instrumental testing for Skin Science, Twin Cities Chapter of the Society of Cosmetic Chemists, Minneapolis MN, April 22, 2015

Electrical and Mechanical Testing of Skin, Hands on Workshop, Cosmetics and Toiletries Summit, Philadelphia, PA, June 25-27, 2014

Basic Skin Science, One day course for the Society of Cosmetic Chemists, Philadelphia PA June 24, 2014.

Instrumental Testing of Skin Care Product Effects on Skin, One day course taught for the Society of Cosmetic Chemists, Newark NJ, April 2, 2014

Skin Care Science – Two day course taught for the International Federation of Societies of Cosmetic Chemists, Moscow Russia, October 7-8, 2013

Biochemistry of the Skin, One day course taught prior to the Society of Cosmetic Chemists Annual Scientific Seminar, St. Louis MO, June 5, 2013

Advanced Skin Science: One day course taught for the Ontario Chapter of the Society of Cosmetic Chemists, Toronto Ontario, March 26 2013

Basic and Advanced Skin Science, 2 day course taught for the Society of Cosmetic Chemists, Newark NJ, April 2-3, 2012

Cosmetic Product Evaluation, 5 day course taught for the International MS in Pharmaceutical Technology, Chulalongkorn University, Bangkok Thailand, August 23-September 3, 2010

Topical Delivery, 5 day course taught for the International MS in Pharmaceutical Technology, Chulalongkorn University, Bangkok Thailand, August 16-20, 2010

Advanced Skin Science, 1 day course for the Society of Cosmetic Chemists Newark NJ, March 23, 2009

Skin Biochemistry, 1 day course for the Florida Chapter of the Society of Cosmetic Chemists, Ft. Lauderdale Fl, November 6 2008

Clinical and Instrumental Testing of Skin, 1 day course Society of Cosmetic Chemists, New York NY, December 5, 2007

Advanced Skin Science 1 day course Society of Cosmetic Chemists, Salt Lake City UT, November 11 2007

Skin Science 1 day course XVIII COLAMIQC, Guatemala City, Guatemala October 21, 2007

Hair Care Science, 1 day course, International Federation of Societies of Cosmetic Chemists, Amsterdam, Netherlands September 24, 2007

Skin Care Science for the Cosmetic Scientist, 1 day course, Society of Cosmetic Chemists, Newark New Jersey, June 21, 2007

Formulation and Development of Color Cosmetics, Mae Fah Luang University, MS in Program in Cosmetic Technology, Bangkok branch, Bangkok Thailand, June 2-3, 2007

Lectures in Cosmetic Science, Mae Fah Luang University, Chiang Rai Thailand, May 28 – June 1, 2007

Skin Care Science 1 day course Society of Cosmetic Chemists, Newark NJ, June 21 2007

Advanced Skin Care, 1 day course Society of Cosmetic Chemists Boston MA, May 10, 2006

Basic Skin Care for the Cosmetic Scientist, 1 day course Society of Cosmetic Chemists, Las Vegas, NV June 1, 2005

Cosmetic Product Evaluation, Chulalongkorn University, International MS Program in Pharmaceutical Technology, Bangkok Thailand, December 22-31, 2003

Skin Care Science for the Cosmetic Scientists, 1 day course for the Society of Cosmetic Chemists, New York NY, December 10, 2003.

Skin Science, Intensive course at Chulalongkorn University, International MS Program in Pharmaceutical Technology, Bangkok Thailand, August, 20-24, 2001

Skin Care Science: A basic course for the cosmetic scientist, Society of Cosmetic Chemists annual scientific seminar, Toronto, Ontario Canada, May 10, 2000.

Bioengineering Evaluation of Aging Skin, International Symposium on Bioengineer and Claim Support in honor of Ronald Marks, Liege Belgium, September 10-12, 1999 with GL Grove).

Hair Care Science: A basic course for the cosmetic scientist, Society of Cosmetic Chemists, Los Angeles CA, February 26, 1997.

Ins & outs of testing skin care products: Including new methods to monitor skin changes. Workshop presented at New Technologies in Anti-aging Skin Care, September 9,10 - 1996, Woodcliff Lake, NJ.(with G. Grove)

Skin Care Science for the Cosmetic Scientist:(with L Rhein) Educational Workshop, presented to the Society of Cosmetic Chemists(SCC), New York NY, December 11, 1996.

R. R. Wickett, Hair Removal, Breakfast Workshop, American Academy of Dermatology, Breakfast Symposium, Washington DC, December 6, 1993 (with A. Kligman)

Biophysical Measurements on Skin: A hands-on course, Educational workshop for the SCC, Atlantic City NJ, May 20, 1992. (with GL Grove)

Can non-invasive methodology replace animal testing? Workshop presented to 8th International Symposium on Bioengineering and the Skin, Stresa Italy, June 1990. (with D. L. Miller)

Evaluation of Hair and Nails, Workshop Presented to 7th International Symposium on Bioengineering and the Skin, Milwaukee Wisconsin, June 1988 (with A. Finlay).

RECENT PODIUM AND POSTER PRESENTATIONS:

RR Wickett, D. Adams, S Burkes and MO Visscher Infant Skin Maturation: Color Features and Biomechanical Properties Over the First Years of Life, World Congress of International Society for Biophysics and Imaging of the Skin, Lisbon Portugal May 31-June 3, 2016

RR Wickett, S Burkes and MO Visscher, Biomechanical Properties of Pediatric Skin and Infantile Hemangiomas, World Congress of International Society for Biophysics and Imaging of the Skin, Mystic CT, June 2-4, 2014

RR. Wickett, Gray and Pigmented Hairs from the Same Individuals may Differ in Both Temporary and Permanent Set. Hairs's13 Conference of the German Wool Research Institute, Lubeck Germany September 4-6, 2013

S. Burkes, RR Wickett, D Adams, MO Visscher *Determination of Infantile Hemangioma Progresion Using Non-Invasive Imaging Modalities.* Poster at Society of Cosmetic Chemists Annual Scientific Seminar, St. Louis MO, June 2013 awarded best student poster

K Wei, C Stella, K Wehmeyer, J Christman, R Johnson, R Wimalasena, T Huggins, L Simms RR Wickett Skin Biomarkers as Objective Measures of Stratum Corneum Barrier Function and Health for Formulating Personal Care Compositions Poster 2617 World Congress of Dermatology Seoul Korean May 24-29 2011

RR Wickett, and MO Visscher, *Factors influencing hand skin health in health care workers: Practices, Environment, Genetics and Treatment Response*, Podium Presentation Society of Cosmetic Chemists Annual Meeting, New York NY, December 2011-

RR Wickett, A Evans and J Marsh, *Interaction of Water Hardness Metals with Human Hair*, Poster at Hairs'11, Meeting of the German Wool Research Institute Munich Germany, September 2011

S. Burkes, K. Burns, MO Visscher and RR Wickett, Early *Effects of the Pulsed Dye Laser on Skin Properties of Burn Scars in Pediatric Patients*" Podium Presentation by S. Burkes, World Congress of International Society for Biophysics and Imaging of the Skin, in Buenos Aires Argentina September 24-26, 2010., awarded outstanding presentation at the conference

RR Wickett, *Influence of TNF-α Polymorphism -308 on Neurosensory Response and Irritant Dermatitis*, International Federation of Societies of Cosmetic Chemists Meeting Buenos Aires Argentina, September 2010

RR Wickett, J Davis, D. Said and MO Visscher, *Effect of Hand Hygiene Procedures on Skin Cytokines in Health Care Worker,* Podium Presentation Occupational and Environmental Exposure of Skin to Chemicals, Edinburgh Scotland 14-17 June, 2009

AO Evans and RR Wickett, *A multiparametric study of the impact of water hardness on metals on human hair,* Poster Annual Scientific Seminar Society of Cosmetic Chemists Chicago Il, June 4-5, 2009

JA Davis, MO Visscher, RR Wickett, *Role of Cytokine Polymorphism in the severity and treatment of hand dermatitis among health care workers*, Poster Annual Scientific Seminar Society of Cosmetic Chemists Chicago Il, June 4-5, 2009

COURSES TAUGHT AT THE UNIVERSITY OF CINCINNATI – (ON CAMPUS AND ONLINE)

Skin Care Science: (with Professor Gerald Kasting)
Lectures and homework assignments covering, basic skin anatomy, epidermis and dermis, dermatological terminology, basic biophysical methods for evaluation of skin, structure of the stratum corneum (SC) and SC barrier homeostasis, skin penetration, skin immune system, skin color, sunscreens, phototoxicity, skin moisturizers and anti-aging products and surfactant skin interactions. **Credit Level: G Credit Hours: 3**

Cosmetic Science Laboratory

Laboratory assignments including formulation of oil-water and water-in-oil emulsions using the HLB method. Formulation of moisturizers. Formulation of shampoos and conditioners. Measurement of viscosity. Product stability testing. Use of emollients to improve skin feel and use of polymers to control product rheology.

Hair Care Science
This course covers the science of hair and hair care products. Topics will include hair growth, morphological and macromolecular structure of hair, physical properties of Hair, reducing agents, reactions and kinetics, permanent waving, straightening and depilation, hair coloring and bleaching, shampoos and conditioners, laboratory and consumer testing methods for evaluating hair properties, hair damage and repair, hair fixatives, dandruff. **Credit Level: G Credit Hours: 2**

Clinical and Instrumental Testing of Skin
This course covers principles of skin clinical testing, including human subject protection, study design and testing on special populations such as infants. The principles behind the most commonly used instruments for studying skin in-vivo are covered along with their use in clinical protocols. Methods covered include skin water loss measurements, electrical measurements, mechanical measurements, Laser Doppler blood flow, Ultrasound imaging, surface contour imaging, optical coherence tomography, skin color measurements, confocal microscopy, skin spectroscopy and magnetic resonance imaging. Protocols for testing moisturizers, cleansing products and "anti-aging" are among those covered. **Credit Level: G Credit Hours: 2**

Molecular Biology of Skin (with Professor Raymond Boissy)
This is an advanced course focusing on the molecular biology of skin. The molecular structure of the epidermis, dermis and dermal epidermal junction will be covered in detail along with key cell signaling pathways in the skin. **Credit Level: G Credit Hours: 2**

Cosmetic Formulation I (with Professor Gerald Kasting)
Lectures and homework assignments covering application of surface and interface science to liquid dosage formulation, surfactant structures and properties, surfactant phase behavior in relation to cosmetic and pharmaceutical formulations, application of surfactant/oil water phase diagrams to emulsion formulation, applications of colloid theory in liquid and semisolid dosage forms, methods for preparing and stabilizing emulsions, particle size characterization in disperse systems rheology, thickening of cosmetic products, silicones in cosmetic formulations, antiperspirants and sunscreen formulation, nanotechnology for cosmetics. **Credit Level: G Credit Hours: 3**